From Correction to Connection: The Effect of Pet Ownership on Recidivism and Empathy in Former Inmates

by

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Abstract

After a person is released from prison the rate at which they reoffend is known as recidivism. Previous research shows that an increase an empathy leads to a reduction of recidivism rates (Kratcoski & Kratcoski, 2017; Wooldredge & Smith, 2018). The introduction of pets has been connected to an increase in empathy of pet owners (Ascione, 1992; Podberscek, Paul & Serpell, 2005). Under this theory, one can expect there to be a correction between pet ownership and a reduction in recidivism. Through the use of Amazon Mechanical Turk, participants were given assessments measuring their empathy, attachment to their pet, and their risk of recidivism. Attachment styles with their pet were discerned as secure, anxious, avoidant or fearful. By analyzing these parameters, a lower risk of recidivism rate was associated with pet ownership and participants with a secure attachment style had a significantly lower risk of recidivism rate compared to participants with an anxious attachment style. Pet owners also scored higher on an empathy measure compared to non-pet owners; however, there were no significant differences in pet attachment style found. A Hayes Process Macro was utilized to look for mediation using a conditional process model. The results indicate the relationship between pet ownership and risk of recidivism was partially mediated by the participant's empathy scores.

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Chapter 1: Introduction

Statement of the Problem

In 2016, America was leading the world in incarceration rates. (Jacobson, Hear & Fair, 2017). America's growing incarceration rate is a major concern of the country and that concern is only increasing (Byrne et al., 2015; Looman & Carl, 2015). Not only is the financial upkeep of prisons rising, but there are associated psychological costs for any individual being kept in a prison for any amount of time (Hutcheson, 2018; Kim, 2019). Many inmates are released with long lasting psychological scars, lack of career skills, and reduced social skills leading to difficulties reintegrating into society (Farabee, 2005; Schnittker, 2014).

America's recidivism rate (the rate at which inmates are charged with a crime after they are released from a jail or prison) is also one of the worst in developed nations (Jacobson, Heard & Fair, 2017). For example, one study followed 404,638 inmates who were released from prisons in 30 states in 2005 (Durose, Cooper & Snyder, 2014). Within the first three years 67.8% were re-arrested and within the first five years 76.6% were re-arrested (Durose, Cooper & Syndyer, 2014). Many prisons have added educational and psychological programs such as GED classes and anger management courses targeted at reducing recidivism (Esperian, 2010; Visher, Winterfield & Coggeshall, 2005). However, studies about these programs provide varied results at best and recidivism rates have been relatively similar throughout the nation since the early 1990s (Doleac, 2019; Durose, Cooper & Synder 2014).

One possible response to America's incarceration and recidivism crises is the incorporation of animals into prison programs. This chapter will briefly introduce the idea of using animals in therapy, and the utilization of animals within prison-based programs targeted at reducing recidivism. Next, there will be a short overview using attachment theory and the human

animal bond as the theorical basis for prison-based animal programs. Lastly, the idea of animals increasing one's ability to empathize with others is introduced. The chapter will end by describing the current study's purposes and its contributions to the fields of both forensic psychology and animal-assisted therapy.

The Beginning of Animals as Therapeutic Aids

Animals have a long history of helping humans. Dogs, in particular, have been dubbed as "man's best friend" from as early as the 1700s when Frederick the Great from Prussia was describing the passion he had towards his pet dogs (Dover, 1832). Therefore, it is only natural that over the years the human animal bond has become a point of interest in the field of psychology (Fine, 2019). In the early 1960s, Dr. Boris Levinson was in the middle of a therapy session with a client when his pet dog, Jingles came in (Levinson, 1962). Dr. Levinson noticed his client, who had emotionally withdrawn, began to make psychological gains when interacting with Jingles (Levinson, 1962). Dr. Levinson started to research and publish papers on the importance of using animals as a "co-therapist" and the remarkable benefits animal-assisted therapy could have on children who were severely emotionally withdrawn (Levinson, 1984). Even though famous psychotherapists occasionally brought dogs into the therapy room before Dr. Levinson's discovery, he fast tracked animal assisted therapy and started to make it a legitimate field (Mallon, 1994).

Currently, there are numerous studies showing strong evidence that therapy animals provide benefits within the therapeutic relationship (Fine, 2019). One of the major benefits of using a therapy dog is they significantly relieve stress in upsetting situations (Fiocco & Hunse, 2017). It is theorized that having a well-trained animal in the room brings a calming effect to almost any situation which allows therapist and client to continue talking about distressing topics

(Fine, 2019). The calming effect has been measured by both self-report (Dell et al., 2015; Ward-Griffin, 2018) and through people's physical body reactions by measuring their blood pressure and heart rate (Barker et al., 2005; Barker et al., 2010; Fiocco & Hunse, 2017) with significant success. One group of researchers even looked at the effect a therapy dog had on a retirement home (Sollami et al., 2017). The participants who had weekly interactions with a registered therapy dog reported they had a higher quality of life, less anxiety, and fewer depression symptoms than the control group who had no contact with the therapy dog (Sollami et al., 2017). However, it was a nun's positive interaction with a therapy dog that would start the course of bringing animals into prisons as mental health aids (Steiner, 2019). Sister Quinn saw the meaningful effect a therapy dog had on her, and she wished to share that feeling with people in correctional environments. She created the Prison Pet Partnership program in 1985 at the Washington Corrections Center for Women, and she paired inmates who had a history of trauma with homeless dogs waiting to be adopted (Steiner, 2019). The inmates were evaluated and after a few years of working with the animals they had a more positive outlook on life, were less aggressive, and their recidivism rate was significantly lower than those who did not work with the dogs (Government Innovators Network, 1986). The success of the program sparked more correction facilities to develop similar programs around the nation (Fine, 2019).

Emergence of Prison-based Animal Programs

While Sister Quinn created the first official prison-based animal program (PAP), animals have been used as a therapeutic tool in justice facilities since 1885 when Wisconsin noticed inmates behaved significantly more prosocial when caring for livestock (Furst, 2006). In a separate case, in 1982 an inmate began caring for an injured sparrow and the staff noticed a positive effect (Lee, 1983). Oakwood Forensic Center in Ohio started to research the effect of

having a pet on their inmates. Dr. Lee (1983) showed that inmates who were allowed to have a pet had significantly less violent infractions, no suicide attempts, and only needed half of the mental health medication they once required. However, it appears that after the research was completed the pets were collected and no official program existed (Lee, 1983). It was soon after that Sister Quinn created the first official PAP (Furst, 2007), where inmates trained local shelter dogs for rehoming and several benefits for both the dogs and the inmates were noted (Government Innovators Network, 1986). The correctional facility where the PAP was in place reported the participants had increased feelings of self-worth, a sense of achievement, and the development of several unique vocational skills (Government Innovators Network, 1986). In addition, the program stated a total of 31 shelter dogs were successfully given training to be placed in a home with an individual with disabilities (Government Innovators Network, 1986). However, PAPs did not start gaining popularity until the early 1990s. By 2018, Vermont and Mississippi were the only states without a PAP (Han et al., 2018). Furst (2006) attributes this rise in programs to two main factors: the inexpensive nature of PAPs and the exposure of the programs on mainstream media such as Animal Planet television shows. PAPs began to be implemented throughout prisons across America. However, when prisons were first implementing PAPs little research was being done on the effectiveness of these programs (Wormer, Kigerl & Hamilton, 2017). In fact, the few papers that were published looking at PAPs were often criticized for lack of generalizability and flaws in methodology (Cooke & Farrington, 2016). This dearth of research did not stop prisons from creating PAPs as anecdotal evidence almost always appeared positive and inmates often attributed the animals with a decrease in recidivism (Furst, 2006; Wormer, Kigerl & Hamilton, 2017). Several studies quoted interviews where inmates discussed how the animals that they trained helped give them confidence, anger

management, coping skills, and emotion regulation (Britton & Button, 2006; Button, 2007; Demyan, 2007; Furst, 2007; Minton, Perez & Miller, 2015).

Recidivism and Other Beneficial Effects

Once qualitative data yielded positive effects of PAPs, quantitative studies about the outcome of PAPs were subsequently done in larger numbers (Furst, 2006). One common finding that was repeated throughout many studies was a reduction of recidivism for inmates who had been enrolled in a PAP (Cookie & Farrington, 2015; Han et al., 2018; Hill, 2018; Wormer, Kigerl & Hamilton, 2017). Hill (2018) specifically indicated that post-conviction re-arrest rates for inmates who graduated from a Florida PAP were significantly lower than other Florida inmates who were not enrolled in a PAP. Han et al. (2018) asserted that PAPs gave inmates skills to develop personal growth and improve on prosocial skills by handling dogs, which allowed them to better integrate into society and have a lower re-arrest rate. Humby and Barclay (2018) looked at PAPs in Australia and demonstrated that almost all of the twenty-three prisons that implemented a PAP saw a reduction in recidivism for inmates who graduated the program. The study specifically noted an increased feeling of belonging to the community and their peers which may have accounted for the lowered re-arrest rates (Humby & Barclay, 2018). Although a specific empathy measurement was not used, it is possible that the inmates gained a sense of community empathy. Another PAP study, this one in Canada, found very similar results (Dell et al., 2019). The inmates enrolled in a PAP had a significant reduction in re-arrests rates along with a belief that they felt more connected to their peers. Once again, the authors did not use a specific empathy measurement but the authors did ask how connected the participants felt with their peers (Dell et al., 2019).

As PAPs are rapidly showing up across the United States, more rigorous research is following and beginning to look at recidivism on a larger, more generalizable, scale (Cooke & Farrington, 2016). Given the previously discussed research, there appears to be evidence for a correlation between PAPs and a reduction a recidivism rate. While the exact meditating variables are still debated, some effects of these variables have been documented. Some of the mediating variables with the most research supporting them are lowered aggression, increased self-esteem, increased pro-social skills, increased compassion, and increased empathy (Furst, 2019; Han et al., 2018). The relationship the inmate develops with the dog, specifically the positive interactions the inmate has with another living being, is theorized as one of the main causes of change (Furst, 2019; Han et al., 2018). Even after the individual is released from jail the positive effects from the PAP appear to continue. Two newspaper articles interview individuals who had been enrolled in a PAP for several months prior to being released (Montoya, 2019; Reid, 2019). One person credited his post-release clean legal record to the PAP giving him a purpose in life (Montoya, 2019), and the other person stated the PAP he was in helped teach him how to belong in a community and remain employed (Reid, 2019). In addition to these anecdotal interviews, more rigorous studies have found similar results. Hill (2018) reported a PAP group had less violent behavior compared to a control group after they were released from prison. Another study demonstrated that inmates who interacted with chickens and cows developed job skills, which made them more employable than a control group upon release (Moore, Freer & Samuel, 2015). Moore, Freer, and Samuel (2015) credited this success to the vocational skills the inmates learned while taking care of the animals. Lastly, a case study analyzed an inmate's post-release life and reported the individual credited his clean record to a PAP (Loeffler, 2016). The individual stated working with animals gave him a sense of purpose in life thus motivated him to

remain sober (Loeffler, 2016). Therefore, having a pet dog after release may provide an individual with a continuation of positive reinforcement which helps promote a decrease in post-release recidivism and other beneficial effects. In general, pet ownership often provides several benefits including more life satisfaction (Bao & Schreer, 2016), more opportunities for social interaction, decreased loneliness (Powell et al., 2019; Sollami et al., 2017), and providing a buffer for life stress (González-Ramírez, Quezada-Berumen, Vanegas-Farfano & Landero-Hernández, 2018; Odendaal & Mintjes, 2003). Also, a pet can provide motivation for life goals such as increased exercise or increased reading ability (Uccheddu, 2019; Yabroff et al., 2008).

Attachment Theory and the Human Animal Bond

The bond that people have with their pets can often parallel relationships people have amongst each other (Barba, 1995). This relationship can be so powerful that people may refer to their pets as their children or call them phrases such as "fur-babies." In fact, when Hurricane Katrina hit the United States, some people refused to evacuate because they did not want to leave their pets behind to die (Mike, Mike & Lee, 2011). Similarly, in 2008 several people risked their own lives to rescue their pets from the wildfires that raged throughout California (Fine, 2019). Clearly, the relationship between an owner and their pet can have an intense emotional bond which can feel more important than even friendships (McNicholas & Collis, 1995).

Authors have asserted that the relationship people have with their pet dog fits the criteria of the relationship that connects two humans on an interpersonal level (Beck & Madresh, 2008, 2005; Fine, 2019). The pet-human relationship often mimics the relationship between two people, thus giving individuals the benefits of a caring, loving, and secure relationship (Beck & Madresh, 2008). Attachment theory has been the suggested theoretical foundation for the human animal bond by APA Section 13 the Human Animal Interaction: Research & Practice, of

Division 17 (Kogan & Blazina, 2018). The section stated that pets remind people of children in many ways which leads people to develop an attachment style that is very similar to an attachment style a parent has with their child (Kogan & Blazina, 2018).

In addition, previous authors have used attachment theory as a foundation for looking at the interaction between humans and animals (Meehan, Massavelli & Pachana, 2017). Meehan, Massavelli and Pachana (2017) demonstrated pets were an excellent source of emotional support for their research participants. Also, pets fulfilled all four characteristics of a secure attachment which includes providing a safe haven, a secure base, implementing proximity maintenance, and bringing about separation distress (Meehan, Massavelli & Pachana, 2017). Beck and Madresh's (2008) results were slightly more conclusive. They looked at 192 pet owner's romantic relationships and compared them to their pet relationships (Beck & Madresh, 2008). The results showed evidence that not only did pets meet all four characteristics of a secure attachment, but they also fulfilled a secure attachment better than the participant's significant other. More specifically, there is evidence to show that pets provide a secure-base and a safe-haven in animal relationships regardless if the participant had a secure relationship with their partner (Zilcha-Mano, Milklincer & Shaver, 2012). This effect was especially significant if the participant did not have a secure relationship with their partner. The authors theorized that the animal interaction acted as a buffer to help mitigate the consequences of negative interpersonal interactions with other people (Zilcha-Mano, Milklincer & Shaver, 2012).

The relationship that inmates develop with their animal in a PAP also plays a critical role in their psychological well-being. Both Weaver (2015) and Aufderheide (2016) examined the relationship between a PAP inmate and their pet, and the results showed that the relationship met all criteria for a secure relationship. Specifically, Weaver (2015) noted that the relationship the

inmate had with their pet had a calming effect, helped the inmate manage their emotions better, and provided comfort in times of need. The secure relationship the inmate had with their pet appeared to help the individual have a clean record upon post-release (Aufderheide, 2016; Weaver, 2015). Lastly, a component of attachment theory is object relations and the idea of a transitional object for personal development (Fonagy, 2018).

Dr. Winnicott coined the term transitional object as "helping children bridge between themselves and the outside world" (Winnicott, 1953, p. 91). The classic example of this is a child's security blanket that they use for comfort during times of distress. A transitional object represents more than just an object to a person. The person maintains a relationship with the object which brings them psychological comfort, establishes a sense of self, and helps develop empathy (Triebenbacher, 1998). This relationship helps prepare them for the more secure and lifelong relationships the individual will have throughout their life (Bollas, 2017). While pets play an important role in providing love and comfort, they unfortunately do not last a lifetime. The role of pets as transitional objects has been researched; Triebenbacher (1998) demonstrated that children who used pets as transitional objects detected other people's emotions and social interactions better and viewed affect and emotional support as more important than children who did not have a pet. Given the theory and research, pets can provide many benefits to a person as a transitional object.

There is limited research examining the use of a pet as a transitional object after a traumatic event. Shubert (2012) analyzed the writings of first responder mental health crisis intervention workers who worked at the World Trade Center on September 11, 2001. The animals who arrived at the site acted as a transitional object helping workers around them begin to heal into a state of normalcy. In addition, Shubert (2012) reported the animals helped the

workers by grounding them in reality and connecting to others in ways that would have been impossible without the animals. Another author also theorized that pets can help their owner transition from a traumatic mindset to an emotional state of equilibrium (Winnicott, 1986). Mims and Waddell (2016) extended the theory and reported that pets can act as a transitional bridge after a traumatic event and help their owners have positive social interactions with others. Therefore, there is evidence that pets can help their owners' transition into a more adaptive lifestyle after a traumatic event.

Empathy

One of the main psychological theories about PAPs and reducing recidivism revolves around having a relationship with a pet (Hill, 2018; Komorosky & O'Neal, 2015). Based on research, having a relationship with a pet can increase the owner's ability to empathize with others which could lead to a reduction in recidivism. Dr. Hoffman's (2001) theory of empathy and moral development asserts that humans have a biological need to recognize other people's emotional states. However, over time, one's ability to empathize with others can decrease due to habituation, over or under arousal, or familiarity bias (Hoffman, 2001). In an effort to try and increase prosocial behaviors in communities' researchers are looking at the effect of pet ownership on one's ability to empathize with others. Podberscek, Paul and Serpell (2005) argued that having an animal as a companion can lead to increased caring attitudes and behavior towards others. There is some research on the association between empathy towards humans and having a pet (Ascione, 1992). One intervention found that interaction with animals increased children's empathy towards their classmates (Ascione, 1992). The results showed evidence that, after a year-long animal intervention program, children scored higher on an empathy assessment and had fewer aggressive behaviors during school hours (Ascione, 1992). These results were not

isolated. A more recent study used the same guidelines and demonstrated that children who interacted with a shelter dog scored higher on the same empathy assessment as the previous study (Sprinkle, 2008). The children also had fewer behavioral problems when they were at school (Sprinkle, 2008). While there is a foundation for this argument, more research needs to be done.

Present Study

The purpose of this study is to examine the recidivism on individuals with a legal history and evaluate the attachment style they have with their pet along with their ability to empathize towards other people. The relationship between owner and pet has been identified to be an important factor in both recidivism reduction and the owner's ability to empathize with others (Chianese, 2010; Daly & Morton, 2006; Moneymaker & Strimple, 1991; Taylor & Signal, 2005). The first hypothesis explored if the presence of a pet dog post-release, similar to previous research outcomes, helped reduce the recidivism rate of individuals who had been previously incarcerated. Findings have suggested that enrollment in a PAPs reduces recidivism rate, and that the relationship the individual has with their animal is a key component for the reduction. Therefore, individuals who have been enrolled in a PAP were excluded from the study as the study examined the pet and owner relationship, and not a PAP effect. Another purpose of this study was to examine the type of relationship the individual has with their pet. Prior findings show evidence that secure relationships between owner and pet provide the strongest effect for a reduction in recidivism. Therefore, this study assessed if the relationship between owner and pet was either secure or anxious. Lastly, another important purpose of this present study was to examine the individual's ability to empathize with other individuals. Given previous findings, it

was expected that individuals who have a pet dog with a secure attachment style will have lower recidivism rates and a greater ability to empathize with other people.

Research question 1. If a person has previously been incarcerated and not previously enrolled in any PAP, would having a pet dog after release be associated with a lower risk of recidivism?

Hypothesis 1.1. Having a pet dog will be associated with a decreased risk of recidivism for individuals with a history of incarceration.

Hypothesis 1.2. An individual with secure pet dog relationship, using the Pet Attachment Questionnaire, will have a lower risk of recidivism versus anxious, ambivalent, or fearful relationship styles.

Research question 2. Do people who have been incarcerated, who now have a pet dog, score significantly higher on the Brief Interpersonal Reactivity Index versus those who do not have a pet dog?

Hypothesis 2.1. People who have been incarcerated, who have a pet dog, will have a greater ability to empathize with others, as measured by the Brief Interpersonal Reactivity Index versus those who have been incarcerated who do not have a pet dog.

Hypothesis 2.2. Individuals who have a secure relationship with their pet, using the Pet Attachment Questionnaire, will score higher on the Brief Interpersonal Reactivity Index versus those that have either an avoidant, anxious, or fearful attachment style with their pet dog.

Chapter 2: Literature Review

Benefits of Animal Interaction

The paths of humans and animals are so intertwined that it is impossible to know who had the first pet. It is largely agreed that dogs were the first pets that humans kept, and the history of pet ownership could go as far back as 31,700 BP (Fine, 2019). A skull, from possibly one of the first domesticated dogs, was found in Belgium from the Aurignacian era (Germonpré, 2009). This could mean humans had pet dogs at the same time they were attempting to cultivate fire. In fact, many studies show that simply having a pet in general can improve several aspects of one's mental health (Fine, 2019). One self-report research study demonstrated that dog owners generally reported stress and more happiness according to the Perceived Happiness Scale (González-Ramírez, Quezada-Berumen, Vanegas-Farfano & Landero-Hernández, 2018). The authors compared non dog owners, dog owners who only had their dog outside, and dog owners who allowed their dog to come inside (González-Ramírez, Quezada-Berumen, Vanegas-Farfano & Landero-Hernández, 2018). A total of 483 participants were involved, and if they had multiple dogs, they were asked to think of the dog they spent the most time with. Eighty-two percent of the sample were women and 18% of the sample were men (González-Ramírez, Quezada-Berumen, Vanegas-Farfano & Landero-Hernández, 2018). A standardized regression showed dog-ownership accounted for 15% of the perceived stress variance, and that percentage would increase to 25% if the individual both allowed the dog to stay in the house and took the dog out as a companion when possible. Dog ownership appeared to account for about 47% variance of the happiness with the participant (González-Ramírez, Quezada-Berumen, Vanegas-Farfano & Landero-Hernández, 2018). Another research study surveyed 263 American adults (131 males, 131 females, 1 declined to respond) using Amazon Mechanical Turk and compared dog owners,

cat owners, and individuals who did not own pets (Bao & Schreer, 2016). The authors used an independent *t*-test and found that pet owners were significantly more satisfied with their life (t = -2.15, p = .032) compared to non-pet owners (Bao & Schreer, 2016). The authors theorized that the closer the relationship the participants had with their pets, the more satisfaction they had with their life. Another experimental study randomly assigned nursing home residents into a control group and a pet therapy group (Sollami et al., 2017). A total of 60 resident home individuals agreed to participate in the study with a mean age of 85 (Sollami et al., 2017). All individuals scoring more than slight on the cognitive deficits area of mini mental state examination were excluded from the study. The control group had no interaction with the dog and the intervention group had a total of 16 separate hour-long sessions that focused on dog activities, such as grooming, playing, and petting. The Quality of Life Scale in Late-Stage Dementia, Hamilton Anxiety Scale, and Loneliness Scale were given pre and post intervention, and the intervention group scored significantly higher on quality of life ($p < 0.001$), significantly lower with anxiety ($p < 0.001$), and significantly lower with loneliness ($p < 0.001$). The control group had no differences after the time period in any assessment. This provides evidence that interaction with an animal, even when that animal is not a personal pet, can give many psychological, social, and motivational benefits.

Along with improving the mental health aspects of people's lives, animals can also help people socialize with others and motivate them to work towards specific goals (Powell et al., 2019; Yabroff, Toriano & Berrigan, 2008; Uccheddu, 2019). An experimental study involving a local humane society examined the effects of dog companionship on social interaction and loneliness (Powell et al., 2019). Seventy-one participants who were interested in adopting a dog, were recruited to be randomly assigned to a lagged control group (22 females, 7 males) or a dog

acquisition group (17 females, 0 males). The researchers worked with a local humane society to give the dog group an adopted dog and gave the lagged control group money to wait to adopt a dog until the study was completed. Pre and post assessments were conducted and the results showed dog ownership significantly reduced loneliness ($p = 0.03$) and significantly increased the average amount of time spent socializing with other people ($p = 0.03$) doing activities such as dog walks. Dogs can also provide motivation to help people walk more (Yabroff et al., 2008). The authors used data from the California Health Interview Survey to analyze the associations between dog ownership and total minutes of walking per week (Yabroff et al., 2008). A sample of 41,514 California adults was used. Yabroff et al. (2008) used a confidence interval to analyze the results which showed that dog owners walked, on average, 18.9 minutes more per week than non-pet owners (95% CI: 11.1 to 26.4). In addition to dog walking, another study found that dogs can provide motivation to help children read (Uccheddu, 2019). This study looked at nine children (7 males, 2 females) who had been diagnosed with Autism Spectrum Disorder and randomly assigned them to a reading group with a dog present or a reading group without a dog present (Uccheddu, 2019). Each group met 10 times per week over the course of 70 days, and two mixed breed female dogs were used in the dog group. In the dog group, the children were asked to read to the dog while in the control group the children read to their peers. The results showed that the dog group had a statistically higher attendance rate compared to peer reading group ($U = 11.0$, $z = -3.468$, $p = 0.002$), and the children in the dog group read more books in total ($p = 0.04$). The dog appeared to have a positive motiving effect on the children in the reading group.

One limitation of the previously discussed research studies is the self-report method of data collection. However, the benefits of animal interaction can even be measured through

physiological indicators. Fiocco and Hunse (2017) recruited 61 participants (47 females, 14 males) who were randomized into a therapy dog group or a control group. Each participant's level of stress was measured by a Biopic galvanic skin response amplifier which reported changes in electrodermal activity associated with psychological distress (Fiocco & Hunse, 2017). The authors found that participants who interacted with the therapy dog left the study with significantly less stress ($F_{(1, 59)} = 15.24$, $p < 0.00$) than the control group who completed the Paced Auditory Serial Attention Task instead of interacting with the therapy dog. In a similar study, Odendaal and Mintjes (2003) demonstrated that participants who stroked and talked to their pet dog had reduced symptoms of stress. The participants were randomly assigned to either a dog petting group or a control group who performed an attention task (Odendaal & Mintjes, 2003). In total, there were ten females and eight males with a mean age of 30 years old. When the blood collections of the participants were measured, the results showed the dog petting group had a statistically significant lowered amount of cortisol levels and their oxytocin levels had doubled. These studies are not limited to traditional pets, as one case study examined a male snake owner's blood pressure while watching and touching his pet snake (Eddy, 1996). The participant was fitted with a blood pressure measuring device while he engaged in block activities designed to be stressful (Eddy, 1996). When he completed the task, his blood pressure reduced significantly quicker when he was able to touch his pet snake compared to engaging with another person or relaxing after the task was completed ($p = 0.01$). Whether it is self-report or measured through medical devices, pets appear to provide several benefits for their owners.

Prison Animal Programs

In 1985, Sister Pauline Quinn, founded the first official prison animal (Kohl, 2012). This was the first program to have both the support of the government and the financial support of the

prison itself (Kohl, 2012). Sister Quinn stated in an interview that she recognized the many benefits of therapy animals when she was in therapy herself, and she wondered about the positive impact animals could have in prison (Steiner, 2019). Sister Quinn called her program Prison Pet Partnership and it paired homeless dogs with inmates who had previously experienced trauma. The inmates would take care of the dog and train it so the dog would become an ideal candidate for adoption (Kohl, 2012). The program began to develop a structure, and the results of the various mental health and physical changes for both the inmates and the pets were recorded. One particular difference in behavior that was noted was the women's "acceptable behavior patterns" which led to a "successful return to society" (Government Innovators Network, 1986, p. 4). The prison staff who helped run the program asserted that the women developed their ability to relate to others which led to a decrease in recidivism (Government Innovators Network, 1986).

In addition, the Prison Pet Partnership program was among the first to show evidence that pairing an inmate with a pet led to psychological benefits that still effected the inmate even after they were released (Kohl, 2012). The Prison Pet Partnership program was so successful that many other correctional facilities started to develop similar programs based on their model (Kohl, 2012). Currently, many PAPs have a comparable structure with minor adaptations dependent upon the prison facility (Furst, 2006). There are a few PAPs that focus on animals other than dogs. One organization, called Larch Cat Adoption Program, runs out of the Larch Corrections Center; this program pairs inmates with a cat until the cat is able to be adopted (Huss, 2013). One counselor who works with the Larch Cat Adoption Program stated the PAP helps inmates feel like they are a part of the community, thus it helps promote more prosocial behavior and reduce their criminal behavior (Huss, 2013). Another multi-state PAP named Wild Horse Inmate Program gives inmates an opportunity to interact with wild mustangs to socialize

them for potential adoptions (Dalke, 2008). Dalke (2008) reported the inmates who completed the PAP specifically said they had more empathy towards other, and they had a broader awareness of how their behaviors affected other people. Lastly, there are even PAPs that take in injured wildlife animals such as birds, foxes, and raccoons (Banagis, 2018). Sheriff Michael Bellottito oversaw the New England Wildlife Center's collaboration with the Norfolk County Jail. Even though he originally stated the mission was to help inmates learn "respect and discipline," many inmates expressed feeling as if they were a part of the community again (Banagis, 2018). They also shared they wanted to take care of other people once they were released (Banagis, 2018).

By far the most popular type of PAP are dog training programs (DTPs) which typically focus on pairing an inmate with one animal selected from a local shelter (Furst, 2006). Usually PAPs will choose dogs that appear friendly towards others and have not been used in illegal animal fighting (Han et al., 2018). Next, the PAP will select the inmates who will participate in the program. There are no national standards or guidelines, so every facility has a unique way of selecting inmates for the program (Hill, 2018). Most facilities encourage inmates to be infraction free (a period of time at the correctional facility without any negative behavior) before they can become eligible for the program (Hill, 2018). However, this does create a selection bias as the individuals most likely to be enrolled in PAPs likely have a history of non-violent behavior and are actively seeking to improve themselves (Furst, 2006). There are a few programs, such as the Project Second Chance, that encourage juvenile offenders with a history of animal abuse, such as dog fighting, to enroll in their PAP (Harbolt & Ward, 2001). The juveniles were given a shelter dog and would spend, on average, three hours a day interacting with their dog to train it for adoption (Harbolt & Ward, 2001). While the data for Project Second Chance is limited, there

does not appear to be any significant outcome differences between juvenile offenders who have a history of animal abuse versus those with no history of animal abuse.

While there are a few different models of PAPs they tend to follow a basic structure. First, there will be a professional agreement between the correctional facility and a local shelter that facilities the pet adoptions (Han et al., 2018). Then, the inmate will usually live with their assigned dog in their cell to make sure the dog's basic needs are provided along with giving care and attention. In addition, there is typically an element of training that occurs daily where the inmate helps train the dog to become socialized and learn household manners to increase their chance of adoption (Han et al., 2018). By the end of the program the dog has learned basic commands, is properly socialization, and is an excellent candidate for adoption. The dog almost always is adopted into a home with a lower return rate than the general population because that dog is now socialized and appropriately trained by the inmate (Han et al., 2018). Some DTPs even offer the inmates certificates in the fields of animal husbandry, veterinarian assistant, animal grooming, and dog training which increases their ability to find a job upon release (Harkrader, Burke & Owen, 2004; Strimple, 2003).

Effects of Dog Training Programs

Research on prison DTPs often yields positive results that vary from inmates gaining increased coping skills, more beneficial ways to deal with their anger, a boost in self-confidence, and a greater understanding of how to regulate their emotions (Britton & Button, 2006; Button, 2007; Demyan, 2007; Furst, 2007; Minton, Perez & Miller, 2015). Also, researchers have found that when a DTP is created, the benefits extend past the inmates enrolled in the program (Currie, 2008). Even inmates who had minimal interactions with DTP members showed more patience and an increased feeling of community (Currie, 2008). All 20 male inmates participating in the

DTP at Ellsworth Correctional Facility in Kansas agreed to be videotaped and interviewed while training their shelter dogs (Currie, 2008). Eighty-nine percent agreed with the statement that the dog interaction gave them source of social support, and 84% felt as if they could hold more responsibility since having a dog (Currie, 2008). In addition, when interviewing staff and roommates of inmates who were in the program, Currie (2008) noted that 80% experienced improvement in social support and feeling as if they were helping others. Simply having a DTP in a prison could potentially influence the entire prison population, including the staff (Currie, 2008). Even though there are many benefits, one of the main objectives of DTPs is reducing recidivism (Hill, 2018).

Recidivism. One of the first major priorities of DTPs in prisons was reducing the amount of times an offender came to prison (Steiner, 2019). Some of the first scholarly articles examining DTPs were taking note of a potential decrease in recidivism (Moneymaker & Strimple, 1991). The Lorton Correctional Complex offered a People, Animals, and Love program which gave 88 male inmates the chance to care for a pet dog until their release. Three years after their release, the program's participants had a recidivism rate of 15.63% (Moneymaker & Strimple, 1991). Even though there was no control or comparison group, the Bureau of Justice Statistics reported that the national average rate for recidivism during the same years was 62.5% (Beck & Shipley, 1989). This offered a strong start for DTP in prisons with the goal of reducing recidivism. The study also paved the way for other researchers to begin to look at the effects that DTPs had on inmate's behaviors when they were released from prison.

A few years after the People, Animals, and Love program was launched, Merriam (2001) examined Project POOCH, a program that focused on having incarcerated juvenile males train shelter dogs to develop prosocial behaviors. Eighty-nine juvenile males were randomly selected

from the MacLaren Youth Correctional Facility to participate. Each participant spent eight hours a day, five days a week, bathing, cleaning, training, and caring for the dogs at the facility. They were interviewed by the researchers and their responses recorded in a narrative format (Merriam, 2001). The two major themes that emerged from the interviews were the dogs helped the juveniles care for another living being, and interaction with a dog helped them identify advanced emotions such as shame and guilt. Merriam (2001) reported that out of the 89 juvenile males who completed the program, none had reoffended within one year of graduation. The average reoffending rate for typical Oregon juveniles during the same time period was 36.8% which shows evidence that the PAP made a difference in the juvenile's lives (Oregon Youth Authority, 2002). Davis (2007) interviewed the same program with a new cohort a few years later. Davis (2007) noted that one participant in particular stated, "I thought people were all manipulative and out to hurt me…so now I can relate to people" (Davis, 2007, p.47). The author theorized that through patience, learning responsibility, developing empathy, learning vocational skills, and improving communication, the youth who were in Project POOCH, went on to make progress towards their personal goals instead of reoffending (Davis, 2007).

Another study evaluated California's A New Leash on Life's program which paired female incarcerated juveniles, who were diagnosed with a conduct disorder, with a foster puppy to raise (Chianese, 2010). Depending on the puppy's age, the juvenile had to give it milk, clean up after it, and begin teaching it basic commands. Her study had a total of 28 intervention participants, 301 exposure group participants, and 116 control group participants (Chianese, 2010). The intervention participants were the juveniles who cared for the puppies on a regular basis, the exposure participants were the juveniles who lived in the same dorm as the intervention participants, but did not responsibility over a puppy, and the control participants did

not live with anyone who was fostering a puppy. She followed the participants for six months post-release and found that none of the intervention participants reoffended, while 11.6% of the exposure group received a criminal charge, and 13.8% of the control group received a criminal charge (Chianese, 2010). The effect of the foster puppy intervention compared to the control group was significant ($z = 1.89$, $p=.029$) as found by a one tailed z test. The difference between the exposure group and either the intervention or control group was not significant. The author suggested that, based on the evidence from the interviews and data, the inmates developed a close bond with the puppy they were assigned to raise. In particular, the bond they developed with the puppy translated into the juvenile wanting to give relationships with other people a chance and wanting being a part of their community in a positive way (Chianese, 2010).

Another researcher, Cooke (2014), used a mixed-methods approach to evaluate five different DTPs located in both Texas and Florida. Cooke (2014) was looking at the effect DTPs had on the recidivism of inmates who participated in them. A total of 93 participants were enrolled in the study. Fifty-eight inmates were chosen to participate in the various DTPs because they were infraction, or negative behavior free, at their correctional facility. Thirty-five inmates were chosen to participate in the control group. Each control participant was eligible to join the DTP, but could not due to a reason unrelated to behavior (i.e. about to be released, dog allergy). There was no standard amount of time when a posttest was given, but the average time passed between original incarceration and posttest was approximately 6.8 months. Cooke (2014) reported that one member of the DTP group had been rearrested and two members of the control group had been rearrested which yielded an insignificant p value ($p = .55$) from a t-test. Therefore, it appears that simply having a DTP does not ensure an automatic effect on

recidivism. Cooke (2014) did not offer an explanation nor did Cooke give any information on how the five DTP differed, if at all, in way from a typical DTP.

There are many specific individual research studies that closely examine the correlation between an inmate's involvement with DTPs and recidivism rates (Chianese, 2010; Merriam, 2001; Moneymaker & Strimple, 1991). There are also comprehensive evaluations and meta-analyses which examine the overall effect that DTPs have on recidivism and mental wellness as a whole (Cooke, 2014; Fournier & Winston, 2019). Fournier and Winston's (2019) chapter in Prison Dog Programs gathers data and methodology from several individual research studies looking at DTPs. They report that DTPs have a strong effect on increasing prosocial behavior and helping inmates decrease recidivism upon release (Fournier & Winston, 2019). Some individual studies even assert that having a DTP in a prison could potentially decrease recidivism for inmates not even directly involved within the program (Fournier & Winston, 2019). However, that assertion needs stronger evidence and more research. One common methodological limitation found in DTP research, is the majority of studies do not have randomly assigned participants to groups. As previously discussed, typically correctional facilities use inmates who have a history of good behavior to be a part of a DTP. This fosters an environment for selection bias where the individuals with a history of good behavior, thus will likely do well upon release, will be working with the DTP group. Individuals with a history of bad behavior, thus will be more likely to reoffend upon release, and will be in the control or exposure group. Both Fournier and Winston (2019) and Han et al. (2018) have noted that it is usually difficult to get prison staff to agree to randomly assign participants to research groups as it is common for correctional facility staff to use DTPs as a positive incentive to behave.

Other post-release effects. While there is ample evidence to support that PAPs help inmates when they are incarcerated, the question still remains if those effects will hold post-release. There are single case studies and anecdotal evidence, but threats to validity and reliability are common with both types of research designs (Kazdin, 2016). Research looking at non-recidivism post-release effects for PAPs with between or within group experimental designs are limited. One newspaper published an article discussing how one individual, who was previously incarcerated with the Michigan Department of Corrections, shared a PAP helped him develop job skills which assisted him finding a long-term job (Reid, 2019). The individual stated he enrolled in a DTP during his 10-year sentence, and he helped train a dog for adoption (Reid, 2019). He elaborated that, during his time caring for the dog, he was able to build prosocial skills and vocational experience which would help him maintain a job after release (Reid, 2019). The Associated Press reported he was released in 2013 and has had no legal infractions since. Another individual, Daniel Robinson, told the KTLA newspaper that they credited their post-release life to a PAP (Montoya, 2019). Daniel Robinson stated he was incarcerated in California for a violent crime (Montyoa, 2019). During his prison sentence, he participated in a prison's DTP for several months (Montoya, 2019). Upon his release, he started a dog training company called Doggy Jitsu, and he credited his business's success, and clean record, to working with dogs while in prison (Montoya, 2019). He specifically stated the DTP helped give him both a path and a purpose after his release. Lastly, a former female inmate at Nevada Department of Corrections worked with the Heaven Can Wait program which pairs female inmates with homeless shelter dogs (Reed, 2020). She stated to Las Vegas Weekly that the program helped her get ready to maintain a full-time job upon her release (Reed, 2020). She stated both the structure of the program and the care she felt from the dogs in the program helped her stay out of prison

upon her release. The newspaper reported she had spent 26 years in prison and currently has a full-time job at a local animal store (Reed, 2020). Heaven Can Wait's program page stated that most of the female inmates who participate in the program have a history of trauma and the dogs they take are of help them heal and trust in their peers again (Heaven Can Wait Animal Society, 2020).

In addition to anecdotal evidence, some PAPs discuss post-release benefits on their webpage. The Missouri Eastern Correctional Center's DTP's official program guide states that inmates who participate in the program gain job skills, patience, and other social skills that help them look more employable upon release (Missouri Department of Corrections, 2018). The program guide reported that three of their dog handlers were immediately hired after release as dog handlers by the program's partnering shelter (Missouri Department of Corrections, 2018). However, the program guide did not cite any research nor did it discuss any evidence behind their claims. Another program's website noted that inmates enrolled in their program are taught empathy, leadership, social skills, and self-discipline, which helps them break the cycle of poverty when they are released (Paws With a Cause, 2018). The website also states that 70-85% of inmates enrolled in their DTP remain out of prison, compared to 50% of inmates at the same prison not enrolled in the DTP (Paws with a Cause, 2018). Unfortunately, Paws with a Cause (2018), does not offer any evidence for their claims. Other programs such as Paws in Prisons (2020), Canine CellMates (2020), and Paws for Life (2020) have the same information on their websites with little, if any, research credited to them. Therefore, the accuracy of their claims cannot be validated. Hill (2018) examined a total of 181,092 inmates from Florida correctional facilities. There were 181,092 inmates in the comparison group and 455 inmates (419 males, 36 females) in the DTP experimental group. Hill (2018) stipulated that, in order to qualify for the

DTP group, the inmate had to be enrolled in the program for at least 31 days. The results showed that the inmates who had enrolled in the DTP had less violent behaviors, within one year post-release, than the control group who had no contact with animals during their time in prison. A multivariate regression analysis was used and showed a significant effect ($\beta = -1.56$, $p = .001$). Another research study interviewed 16 inmates (gender not reported) at the Marion County Sheriff's Office Inmate Work Farm Program (Moore, Freer & Samuel, 2015). The interviews were semi-structured and focused on the inmate's experiences both working with the animals at the farm and their lives post-release (Moore, Freer & Samuel, 2015. The authors stated the complied interview data were analyzed using the Straussian Grounded Theory coding then a constant comparative method. The researchers reported that 15 out of the 16 participants believed that working with the chickens and cows gave them life skills which made them more employable post-release. There was no control group in the study, but the 15 individuals who reported positive effects stated they were successfully employed within the first quarter (4 months) of being released from prison (Moore, Freer & Samuel, 2015).

Lastly, a case study dissertation examined an inmate enrolled in the Wild Horse Inmate Project at an Arizona correctional facility (Loeffler, 2016). The participant reported he was serving a one year sentence for a drug related offence and he volunteered to take part in a survey about his post-release life (Loeffler, 2016). He was interviewed while he was working with the Wild Horse Inmate Project and two months post-release. The participant stated the PAP helped him stay sober after his release by giving him confidence and a reason to live. In addition, Loeffler (2016) claimed the PAP helped teach the participant vocation skills, so he immediately found a job upon being released. The author stated the participant had not reoffended (Loeffler, 2016).

Human Animal Bond

The bond between a human and an animal can be hard to define. Robinson (2013) wrote eight pages in his textbook attempting to define it and eventually stated the relationship "fulfills human needs that are beyond simple economic needs" (p. 8). In addition, a presentation at the International Symposium on Human-Pet Relationship defined the bond as "similar to human functions that go hand in hand with the emotions of love and friendship in the purest and noblest forms" (Bustad, 1985, p. 3). Even though this definition is still used in the 2019 edition of the Handbook on Animal Assisted Therapy (Fine, 2019, p. 6), it is not suitable for research as it does not provide rigorous definitions. Some authors have even asserted it is too difficult to define the complexity of the human animal bond (Bayne, 2002; Davis & Balfour, 1992). Therefore, the American Veterinary Medical Association's Committee on the Human-Animal Bond's definition will be used as it is a definition accepted within the veterinary field, and was developed by a committee of experts (JAVMA, 1998).

> "A mutually beneficial and dynamic relationship between people and other animals that is influenced by behaviors that are essential to the health and well-being of both. This includes, but is not limited to, emotional, psychological, and physical interactions of people, other animals, and the environment" (JAVMA, 1998, p. 2).

The connections people describe with animals can be lifelong, impactful, and even stronger than familial relationships. In fact, one author reported that a majority of pet owners interviewed stated that they believed their pet truly loved them in the same way a family member would love them (Serpell, 1996). Serpell (1996) further asserted that people's desire to anthropomorphize animals could be an evolutionary response in order to have our emotional needs met. One common theory is that humans were hunting and gathering, animals were heavily

relied upon to meet basic needs (Serpell, 1996). For example, domesticated dogs likely helped humans hunt and defend against other wild creatures. Subsequently, humans then domesticated other animals, such as pigs and goats, to use for meat and milk. Serpell (1996) argues that without anthropomorphizing animals our relationship with them would be meaningless. One anthropologist agrees and even takes the theory a step further. Shipman (2010) reports that it is widely accepted that the three main traits that distinguished the homo sapiens from other mammals are "making and using tools, symbolic behavior, and the domestication of other species" (p.1). Shipman (2010) continues to hypothesize that there is a fourth trait which is the human animal connection. The ability to connect emotionally with animals is so fundamental to humans that it may even be hardwired within our makeup (Fine, 2019; Serpell, 1996; Shipman, 2010).

Regardless if the desire to connect with animals is evolutionary, it is clear that many people feel a deep connection with their pets. This relationship is so strong that people are willing to put their own lives at risk for the safety of their animals (Hunt, Bogue & Rohrbaugh, 2012; Mike, Mike & Lee, 2011). During 2011, a category three hurricane hit the Eastern United States which caused an estimated 49 deaths (McBean, Bruce & Kovacs, 2012). A post disaster survey was given to 90 pet owners and 27 non-pet owners who lived in mandatory evacuation zones (Hunt, Bogue & Rohrbaugh, 2012). Fifty one percent of pet owners who decided to stay and endure the hurricane stated their main reason for staying was a pet-related factor such as the inability to transport their pet or the lack of a pet-friendly location. Staying in a home while a devasting hurricane approaches because of a pet was not isolated to Hurricane Irene. Hurricane Katrina resulted in 1,822 deaths and an estimated $160 billion dollars of damage (Blake, Rappaport & Landsea, 2007). When government officials started to analyze post-disaster

damages a common theme which was found was pet owners would rather stay at home and risk personal harm than leave without their pet (Mike, Mike & Lee, 2011). Due to the number of people who died because they did not want to risk their pets, the Pets Evacuation and Transportation Standards Act of 2006 was placed into law (Mike, Mike & Lee, 2011). This law mandates local counties take pets into account when placing mandatory evacuations. People are willing to place their life on the line to make sure their pet has a chance at remaining safe. This speaks to the strong bond that a pet owner can have with their animal.

Pets can also become a member of household families. Many people consider their pets as actual family members and begin to assign human emotions to their pets (Selby & Rhoades, 1981). While this may seem bizarre or negative to people who do not engage in such behavior, viewing pets as emotional creatures can bring a sense of security, safety, and consistency that people desire (Beck & Katcher, 2003). The role that many pets fill in a family is one of a child or even a baby (Fine, 2019). When observed interacting with their pets, many owners engage in a speech patterned called "motherese," which is a type of communication associated with an older person talking to a child (Hirsh-Pasek & Treiman, 1982). A typical motherese interaction involves the older individual speaking in a higher pitched tone and using simple words in shorter sentences. Burnham, Kitamura and Vollmer-Conna (2012) examined how 12 mothers spoke to their pet dog or cat and then how they spoke to their infant. Each participant was recorded as she was asked to read a story to her infant or her pet (Burnham, Kitamura & Voillmer-Conna, 2012). When the video tapes were analyzed, the authors found all but one participant spoke to their pet and infant with a higher pitch and a more emotional speech pattern than they did with a confederate. The study did not look at the complexity of words in sentences, but they did find a significant difference ($F_{(1,11)} = 36.52$, $p < .0001$) with pitch and affect when pet owners spoke to

their pet versus an adult human (Burnham, Kitamura & Vollmer-Conna, 2012). If a pet does not take on a child role, they usually take on the role of close friend or even confidant who the pet owner can talk to and share emotional experiences (Triebenbacher, 2000).

One research study looked at 256 human-human relationships and 244 pet owner relationships (Bonas, McNickholas & Collis, 2000). All the pet owner relationships were either with a cat or dog, except for 23 who used a relationship with their pet bird. The authors used a modified version of the Network of Relationships Inventory to collect data on the nature of the pet owner's relationships with their pets. When the relationships within a household were empirically analyzed by a two-way analysis of variance, the authors demonstrated that dogs provided more perceived support ($F_{(5,206)} = 4.0$, $p = .002$) than other human members of that household (Bonas, McNicholas & Collis, 2000). Overall, pets play a special role in many people's lives as they see them as family members, close friends, and even children. The bond between human and animal can be strong and hard to define, but it tends to provide both parties with many benefits.

Attachment Theory

Attachment theory is a foundational basis for practicing psychotherapy (Cassidy & Shaver, 2002). The premise of the theory revolves around the attachment between an infant and their caretaker, and how that infant interacts with the world based on their caretaker attachment. The theory supports that there needs to be a sense of security around the relationship between infant and mother (Ainsworth & Bowlby, 1965). Later, Bowlby (1988) would define this characteristic as a secure base and theorized when this base is threatened the child will feel jealousy, anger, or anxiety. Even more, if the secure base is broken or eliminated the child will feel grief and even depression (Bowlby, 1988). The type of relationship the child develops with

their mother will strongly affect how the child interacts with their world as they grow (Ainsworth & Bowlby, 1965). At first, there were three different types of attachments between the mother and infant which were described as no deprivation, partial deprivation and complete deprivation (Ainsworth & Bowlby, 1965). No deprivation was when the mother and infant had a secure relationship, and the mother provided plentiful but not excessive comfort. Partial deprivation was when the infant had a loving mother but was then removed from her or had a mother who provided insufficient comfort. Lastly, complete deprivation was when an infant had no one who cared for them. This type of attachment was commonly found in orphanages, hospitals, or institutes (Ainsworth & Bowlby, 1965). A partial or complete deprivation would result in an infant who could not cope with their emotions, had no sense of self, and had difficulty interacting with other people. Later, the theory was revised to include more gender-neutral words such as caregiver instead of mother, and the three previous attachment styles were expanded into four which include secure, anxious-avoidant, anxious pre-occupied, and disorganized (Bowlby, 1988).

John Bowlby and Mary Salter Ainsworth are considered the founders of attachment theory (Cassidy & Shaver, 2002). Bowlby first noticed that adolescent boys who had difficulty forming relationships with people also had disruptions in their relationships with their mothers (Bowlby, 1944). Bowlby examined 44 children who had been arrested for theft and compared them to 44 children who Bowlby had matched for sex, race, age, and socioeconomic background, who had not been arrested (Bowlby, 1944). He then classified each child as either Normal (stable), Depressed (more often in a sad state), Circular (oscillate between sad and excited), Hyperthymic (more often in an excited state), Affectionless (lacks typical affection and empathy), and Schizoid (shows signs of possible psychotic symptoms). Bowlby (1944) found

that the majority of children in the thief group were classified as affectionless, and they tended to commit more theft than their peers in other groups. While Bowlby (1944) reported affectionless children as a significant difference from the control group, he provided no statistical evidence in his paper. One of his concluding theories from his first paper was he believed that children who had not received affection as a child had a harder time forming relationships with their peers as they got older. Therefore, Bowlby's and Ainsworth's initial work tended to focus the relationship the child had with their mother.

Ainsworth developed the "Strange Situation" test to begin assessing the type of attachment relationship a child had with their mother (Ainsworth & Bowlby, 1965; Cassidy & Shaver, 2002). In the strange situation test a mother and her 49-51-week-old infant are placed within a room for 21 minutes and watched by researchers as they played with toys (Ainsworth & Wittig, 1969). Then, the child is observed as a stranger enters the room while the mother leaves the room. A specific time is not given, but after a few minutes the mother comes back into the room and is reunited with her child (Ainsworth & Wittig, 1969). Based on the child's reactions the relationship between infant and mother is either labeled secure, anxious-avoidant, anxious-preoccupied, or disorganized. These four categories are based on two dimensions (anxiety and avoidance) that show if the infant is more prone towards having anxiety responses towards interpersonal relationships or if they need to avoid interpersonal relationships (Cann, Norman, Welbourne, & Calhoun, 2008). See Figure 1 for a visual model.

The four attachment styles. A secure attachment is when an individual has internalized a positive representation of an interpersonal relationship (Van Buren & Cooley, 2002). This relationship is one that has love, support, assistance, safety, and comfort while letting each person have appropriate levels of independence (Gillath, Selcuk & Shaver, 2008). Many research

studies over the years have shown evidence that being in a secure relationship can lead to higher life satisfaction, more adaptive ways of dealing with stress, developing resilience during tough periods, and reduces the likelihood of having a psychological disorder (Cassidy & Shaver, 2002; Olufowote, Fife, Schleiden & Whiting, 2019; Sable, 2008). One research study examined 15 women and five men who fit the criteria for a secure relationship (Olufowote, Fife, Schleiden & Whiting, 2019). Each individual was interviewed and their results were examined looking for themes of positive attachment change, making intrapsychic changes, and making interpersonal changes (Olufowote, Fife, Schleiden & Whiting, 2019). The authors used TAMS, a qualitative analysis software, to distinguish the amount of times each theme was brought up in the participant's interview. The results indicated the more secure the participant's relationship was the more likely they were to feel satisfied and happy both within their relationship and overall with their life. The four attachment styles were investigated by the strange situation test (Ainsworth, Blehar, Waters & Wall, 2015). During the strange situation test, a child will use their caregiver as a secure base in order to explore the various toys around the room (Ainsworth, Blehar, Waters & Wall, 2015). If the child needs any comfort or reassurance they will return to their caregiver, and the caregiver will respond in an attentive manner while meeting the needs of the child (Ainsworth, Blehar, Waters & Wall, 2015). If a stranger enters the room when the caregiver is present the child will engage with the stranger. However, if the caregiver leaves the room the child may cry or show signs of being upset. When the caregiver returns the child is visibly happy. This attachment style is low avoidance and low anxiety on the two-dimension model (see Figure 1).

The anxious-avoidant attachment style is when the individual has internalized a positive perception of themselves, but a negative perception of the world and others (Van Buren &

Cooley, 2002). In this attachment style, the individual tends to need emotional distance from the other person or high amounts of independence which can be seen as an effort to avoid being in the relationship. The individual may believe they do not need relationships or they do better off not being in a relationship (Van Buren & Colley, 2002). People who have an anxious-avoidant attachment style tend to have more anxiety and depression, than securely attached individuals (Priel & Shamai, 1995). Priel and Shamai (1995) gave 328 undergraduate psychology students assessments to measure their relationship attachment style, anxiety, and depression. The authors found a statistically significant univariate ANOVA correlation between the level of security in the participants relationships and how likely they were to suffer from either depression (F = 14.22, $p < .0001$) or anxiety symptoms ($F = 32.45$, $p < .0001$). The participants in securely attached relationships were less likely to suffer from depression or anxiety. In addition, people who have an anxious-avoidant attachment style are more likely to have lower self-esteem levels and a higher likelihood of having physical health complaints (Widom, Czaja, Kozakowski, & Chauhan, 2018). Researchers examined 650 adults who were a part of another study looking at the long-term effects of child neglect (Widom, Czaja, Kozakowski, & Chauhan, 2018). They used a cohort design and matched the children who had histories of neglect with children who had no history of neglect. The authors used the Relationship Style Questionnaire to assess the type of relationship attachment each participant in the study had as well as a 10-item self-report scale to measure the participant's self-esteem (Widom, Czaja, Kozakowski, & Chauhan, 2018). Lastly, they noted the participant's response to nine physical health indicators including blood pressure, cholesterol, creatinine clearance, and peak air flow. The bivariate zero-order correlation results found that participants with anxious-avoidant attachment styles had the lowest reported self-esteem levels ($\beta = 31$, $p < .001$) and most physical health complaints ($\beta = .35$, $p = .006$)

(Widom, Czaja, Kozakowski, & Chauhan, 2018). During the strange situation test, a child with an anxious-avoidant attachment style will usually either avoid or even ignore the caregiver (Ainsworth et al., 2015). Even when toys are placed around the room, the child will typically ignore them and not explore. When the caregiver leaves and returns into the room the child will show little emotion (Ainsworth et al., 2015). Ainsworth and Wittig (1969) proposed a theory that the avoidant behavior may be used as a front to cover up the distress the child is actually feeling. This attachment style is high avoidance and low anxiety on the two-dimension model (see Figure 1).

The anxious-preoccupied attachment style is when the individual has internalized a negative perception of themselves, but a positive perception of the world and others (Van Buren & Cooley, 2002). Individuals with this relationship style tend to have a high desire to be in close relationships and seek the approval of others (Van Buren & Colley, 2002). They may become overly dependent on their romantic partner or even be seen as "clingy" (Cassidy & Shaver, 2002). Individuals who have an anxious-preoccupied attachment style, engage in more negative communication styles including yelling and fighting versus people with secure attachment styles (Feeney, 1994). In addition, the same individuals tend to satisfy their partner's concerns over their own, as they usually have internalized a negative view about themselves yet a positive view about their romantic partner (Shi, 2003). Shi (2003) examined 448 undergraduate students who reported they were in a serious relationship. The Multiple-Item Measure of Adult Romantic Attachment was used to assess the individual's attachment style and the Rahim Organizational Conflict Inventory was used to assess the individual's nature of handling their own concerns versus the concerns of their partner. A multiple regression analysis was used to examine the participant's attachment style and their conflict resolution behaviors. The results showed that

individuals who had anxious-preoccupied attachment styles would more often attempt to fix their partner's needs before focusing on their own ($\beta = .20$, $p < .001$). During the strange situation test, a child with an anxious-preoccupied attachment style would begin to show signs of discomfort even before their caregiver left the room (Ainsworth et al., 2015). The child rarely played with toys that were in the room and appeared either angry or helpless when their caregiver left the room. When the caregiver returned, the child had difficulty leaving the caregiver's side and was hard to comfort. This attachment style is low avoidance and high anxiety on the two-dimension model (see Figure 1).

The last attachment style is disorganized. This attachment style is when the individual's internalized perception of themselves, the world, and others fluctuates between positive and negative (Van Buren & Cooley, 2002). Individuals with this relationship style tend to have a history of trauma, such as abuse or neglect in their childhoods, which causes the fluctuating views on themselves and others (Cassidy & Shaver, 2002). They may be seen as confusing as they desire love from others, but sometimes do not see other people as trustworthy (Cassidy & Shaver, 2002). Therefore, they usually have difficulty expressing their feelings resulting in contradictory behaviors reflecting their internal fluctuating perceptions. One theory behind disorganized attachment style is the fear of others is the foundation that makes the individual's beliefs fluctuate (Paetzold, Rholes & Kohn, 2015). Individuals with this relationship style lack a cohesive understanding of both themselves and others which often leads to fighting and overall confusion in relationships (Paetzold, Rholes & Kohn, 2015). Also, aggression and violent behavior are more commonly found in people with a disorganized attachment style (Main, Kaplan & Cassidy, 1985). A research study recruited 40 mothers and fathers who had a six-year-old child (24 males, 16 females) and who lived in the Bay Area of California (Main, Kaplan &

Cassidy, 1985). All children in the sample were identified as having a disorganized attachment with their parents from engagement in the strange situation test. The children were watched playing with their peers both at the time of the study and during a five year follow up visit. While there was no control group, the authors compared the video tape from the first play session to the second play session. The results showed the children engaging in more violent or aggressive play behaviors (i.e. hitting stuffed animals, yelling negative phrases at peers) if they maintained a disorganized attachment style later on in life ($r = .62$, $p < .001$). During the strange situation test, the child typically displays contradictory behaviors, such as crawling towards the mom then freezing, throughout the entire test (Ainsworth et al., 2015). These behaviors often included stereotypical movements such as head nodding or even gazing at nothing for an extended period of time (Ainsworth et al., 2015). This attachment style is high avoidance and high anxiety on the two-dimensional model (see Figure 1).

Four Features of Attachment Relationships

Typically, the relationship measured with attachment theory is either the individual's relationship with their caregiver or their relationship with their romantic partner (Cassidy & Shaver, 2002). The caregiver or romantic partner would then be considered an attached figure. However, more recently pets have started to fulfill that role (Fine, 2019). Fine (2019) explores the concept of a pet fulling the role of an attached figure by bringing up how pet owners treat their pets like their children. Most importantly though, Fine (2019) argues that there is strong evidence to suggest that pets can fulfill the four features that an attached relationship must have. Those four features are a secure base, a safe haven, proximity maintenance, and separation distress. If all four characteristics are met within a relationship then the relationship is considered to be an attached relationship, which is more meaningful than a relationship between friends or

acquaintances (Ainsworth, 1991; Cassidy & Shaver, 2002). Throughout most of attachment theory this relationship was considered almost exclusively human to human, but now the argument is being made that a human and pet relationship can meet the four criteria as well (Fine, 2019). This would mean that an owner could have an attached relationship with their pet according to attachment theory (Fine, 2019). Therefore, a secure relationship with a pet could give the same benefits to the owner as a secure relationship with another human.

The first feature of an attachment figure is the ability to provide a secure base (Ainsworth, 1991; Cassidy & Shaver, 2002). When a secure base is provided, the other individual can roam and explore while knowing that the attachment figure is dependable and will help if the individual is vulnerable or scared while exploring (Ainsworth, 2006; Cassidy & Shaver, 2002). Similarly, a safe haven assures the individual that the relationship is reliable and they can come back to the attached figure at any point in time. With a safe haven, the attached figure will always provide reassurance that the individual can return to a place of safety in any time of distress. The main difference between a secure base and a safe haven is the secure base provides comfort for the individual to explore and the safe haven provides comfort for the individual to return (Cassidy & Shaver, 2002). The two concepts are similar, but they do have subtle differences. In attachment theory, a safe haven is developed during the first year of the relationship, and if this is impaired the individual will have difficulty seeking out help and comfort from other people when they are in distress (Cassidy & Shaver, 2002). A secure base is developed after a safe haven when the individual feels more confident to begin exploring their environment without fear of rejection by their attachment figure. If this development is impaired then the individual will have difficulty trusting other people and forming close relationships (Cassidy & Shaver, 2002).

The third characteristic of an attachment relationship is proximity maintenance. It starts with the attachment figure being physically close and accessible in case something distressing occurs (Ainsworth, 2006; Cassidy & Shaver, 2002). If the attachment figure is too far away, too often, then separation anxiety may occur. Also, if the attachment figure is too close for too much of the time, the individual will not learn how to be properly independent (Cassidy & Shaver, 2002). Lastly, an attached relationship has separation distress. This means the individual begins to feel negative emotions such as sadness, longing, or missing the attachment figure if they are gone for too long (Cassidy & Shaver, 2002). If the attachment figure is gone too often for too long, then the individual will begin to look for another person to be attached with. Each attached relationship has varying levels of secureness for each of the four features (Ainsworth, 2006; Cassidy & Shaver, 2002). A secure relationship is one where each feature is provided in a safe and balanced way.

Pets Within Attachment Theory

Typically, an attached relationship is between a caregiver and a child, but there is evidence that shows pets can provide each of the four characteristics. For a number of years, scholars have argued that a pet can appropriately function in attached relationships (Zilcha-Mano, Mikulincer & Shaver, 2011) In fact, Levinson (1962) began asserting that pets had a role in an attachment relationship since he noticed the benefits of having a dog in the therapy room. Once a theory was discussed, researchers began to look into how pets functioned within attached relationships. Kurdek (2008) gathered four different sample groups for a total of 975 undergraduate college students who owned dogs. Each participant was assessed on their attachment with their dog and how close they felt to their dog using the Experiences in Close Relationships Questionnaire (Kurdek, 2008). Kurdek (2008) asked the participants to rate (1 =

strongly disagree, 7 = strongly agree) each attachment feature for various relationships. The mean ratings showed that human figures (caregivers and close friends) exhibited more features of secure base (6.09) safe haven (5.62), and separation distress (5.54), but dogs showed an appropriate level of each of the four features to be said that they provided their owners with a secure base (4.96), a safe haven (4.25), sufficient separation distress (5.21), and proximity maintenance (4.55). A multilevel regression analysis was used to compare the human models to the dog model. These two models had a significant correlation $\chi^2(3,N = 111) = 105.82$, $p < .01$ when compared (Kurdek, 2008).

Each of the four characteristics of an attachment relationship can be broken down and examined within the owner and pet relationship. One study specifically examined if dogs could provide their owners with a safe haven, even during times of emotional distress (Kurdek, 2009). Nine hundred and seventy-nine adult participants (789 women and 186 men with the mean age of 47.95 years) were recruited to take an online survey where they completed an adapted version of the Emotional Reliance scale to measure the amount of safe haven their dogs provided (Kurdek, 2009). The assessment was adapted to include the use of nouns for pets instead of romantic partners. A one-way (feature) multivariate repeated measures analysis of variance was used to calculate the results. The participants were significantly ($F_{(3, 972)} = 203.40$, $p < .01$.) more likely to seek comfort from their pet dogs in times of emotional distress than they were from family and their best friends, but not their romantic partner. These results were almost the same as Kurdek's 2008 study. If the participant had a secure relationship with their pet dog, then they were more likely to turn to their dog in times of distress, compared to someone who did not feel close with their pet dog or saw the dog as more of an object and less of a relationship (Kurdek, 2009). Another research study measured people's attachment to their pets, specifically looking at

pets as the providers of a safe haven and a secure base for their owner (Zilcha-Mano, Mikulincer & Shaver, 2012). This study went beyond self-assessment measures and looked at the participant's systolic and diastolic blood pressure under stress (Zilcha-Mano, Mikulincer & Shaver, 2012). A total of 165 Israeli cat or dog owners (90 women and 75 men) ranging from 18 to 68 years old were recruited for the study. They were randomly assigned to either do the experimental task of interacting with their pet while performing a stressful task, or they were assigned to the control group where they performed a goal-generation task without their pet in the room. While each group was performing the task their diastolic and systolic blood pressure was being taken by a physiological recording device. In addition, each participant filled out the Pet Attachment Questionnaire to assess the type of relationship they had with their pet. If the participant had a secure relationship with their pet then being with their pet helped relieve stress, when doing a stressful activity. A regression analysis showed the presence of the pet had a main effect of $\beta = .30$, $p < .01$, between the experiment and control group. Even further, participants with a secure relationship with their pets believed their pets provided a safe haven and secure base more than participants who did not have a secure relationship with their pet. However, if the participant had either an anxious-avoidant or anxious-preoccupied attachment style with their pet, then that pet did not help relieve stress and their systolic and diastolic blood pressure were not affected by their pet (Zilcha-Mano, Mikulincer & Shaver, 2012). This mirrors similar studies which look at secure relationships between people during stressful times with similar results (Crump & Derting, 2015; Ein, Li & Vickers, 2018; Kertes et al., 2017).

People often feel close with their pets, so when the pet is removed, they often endorse feeling sad or lonely (Kurdek, 2009). This can trigger separation distress for both the owner and the pet (Ogata, 2016). In interviews with dog owners after a death of a dog, the vast majority of

people endorsed feeling “intense grief” and their responses were almost equally consistent with responses from the loss of an attachment figure in a caregiving relationship (Kwong & Bartholomew & 2011). In total, 25 people’s responses were recorded, all of which had endorsed the death of at least one pet dog. A control group was not used, but Kwong and Bartholomew (2011) reported they used previous research findings to compare their results to individuals who had lost a human attachment figure. The authors asserted that the dog owners had separation distress which was similar to separation distress of those in human and human attached relationships. A number of studies have provided evidence that owners suffer emotional grief after losing a pet (Barnard-Nguyen, Breit, Anderson & Nielsen, 2016; Cox, 2017; Rémillard, Meehan, Kelton & Coe, 2017). When comparing grief between human and pet loss one study found that people rated pet loss grief slightly less in severity than human loss but still significant and distress provoking (Eckerd, Barnett & Jett-Bias, 2016). Two college student samples were examined with a total of 211 people endorsing the recent (within two years) loss of a pet and 146 people endorsing the recent loss of a person (Eckerd, Barnett & Jett-Bias, 2016). The Core Bereavement Items and the Pet Bereavement Questionnaire were used to access the level of grief each participant had. While the effect size was small (*ds* = .28-.30) a multiple linear regression showed a significant result, $F(10, 132) = 11.98$, $p < .001$. However, it is not just death of a pet that can trigger separation distress. In a 2010 survey, 14% of United States adult pet owners reported that they travel with their pet, and when examined for reasons why, the majority endorse that they saw their pet as a member of their family and do not want to be separated from them (Dotson, Hyatt & Clark, 2010). More specifically, the closer the emotional attachment the pet owner had with their pet the less willing they were to leave their pet at home, regardless of income, when they traveled (Kirillova, Lee & Lehto, 2015). A tourism research study gave 187

Midwestern pet owners (130 females, 23 males) a questionnaire asking several custom questions regarding traveling with pets (Kirillova, Lee & Lehto, 2015). There were 18 statements on a 5-point Likert-type scale about traveling with pets, satisfaction with pet-related tourism services, and demographic information (Kirillova, Lee & Lehto, 2015). The statements were taken from a The authors used a regression model and the results showed a significant result ($F = 23.20$, $p < .001$) where willingness to travel with pets explained 36.9% of the variance (adj. $R^2 = .369$) examined.

Finally, the least researched characteristic with relationship to pet ownership, is proximity maintenance. Sable (1995) noted that a majority of pet owners reported they preferred to be around their pet than their friends. Also, some people say they enjoy the neediness that a pet often has with their owner (Kurdek, 2008). Being around each other allows for a constant flow of close proximity, physical engaging which can take the form of kissing, tummy rubbing, play time, and even cuddling (Kurdek, 2008). A part of Kurdek's (2008) study, which was previously discussed, asked 975 participants to fill out an Experiences in Close Relationships Questionnaire while thinking of their pet. Even though, when examined, a pet dog had the lowest rating of proximity maintenance compared to parents, siblings, best friends, and significant others, a one-way (feature) multivariate repeated measures analysis of variance showed they were still significant ($F_{(3,972)} = 203.40$, $p < .01$) and showed that a pet dog did in fact provide a high amount of proximity maintenance for an attached relationship. This means participants endorsed gaining the most enjoyment out of being physically close with their pet dog (Kurdek, 2008). Other studies have also provided evidence that pet owners enjoy being physically close with their dog and enjoy engaging in physical playtime or petting activities (Fine, 2019; Prato-Previde, Fallani & Valsecchi, 2006). Even further, being in the physical presence of a pet can

help lower pet owner's heart rate and blood pressure after engaging in a stressful activity (Allen, Blascovich & Mendes, 2002). Researchers recruited 480 individuals to potentially bring their pet into a research lab while they did a stressful activity (Allen, Blascovich & Mendes, 2002). The participants were randomly assigned to perform the stressful activity with a pet, with a spouse, or alone. All participants reported they took no cardiovascular medication, and each had a healthy (<140/90) blood pressure before the study started. Each participant performed a series of rapid serial subtraction and other difficult math tasks while sitting next to their pet, spouse, or alone. Using a multivariate analysis of covariance, both the pet ($p < .0001$) and spouse ($p < .0001$) condition had a significantly lower blood pressure rate than the alone condition. However, participant's blood pressure in the pet condition recovered quicker than in the spouse condition ($F_{(3,219)} = 5.76$, $p < .0008$).

In addition to pets fulfilling each of the four characteristics of an attached relationship, a pet can function as a transitional object or comfort object in object relations theory (Cassidy & Shaver, 2002). While Dr. Bowlby was originating insights into the development of the infant and caregiver relationship, there was some overlap into object relationships theory as the various attachments on objects were explored (Cassidy & Shaver, 2002). Dr. Winnicott coined the term transitional object as "helping children bridge between themselves and the outside world" (Winnicott, 1953, p. 91). Research has provided evidence that transitional objects can function as a supplement to attachment figures, reducing separation anxiety with the individual and promoting the individual to explore their world (Busch, Nagera, McKnight & Pezzarossi, 1973; Lookabaugh & Fu, 1992; Triebenbacher & Tegano, 1993). A typical transitional object with a child is their security blanket in which they carry around with them when they explore the world or sleep at night (Winnicott, 1953).

A transitional object can help the individual develop more secure relationships as the object helps comfort, provides security, and emotional support to the individual exploring the world (Triebenbacher, 1998). There have already been many studies indicating strong evidence that pets can be used as a living transitional object for individuals, especially children (Katcher, 2006; Reichert, 1998; Triebenbacher, 1998; Wolfe, 1997). This would mean pets serve an important function for individuals exploring the world and developing relationships with other people. Cwik (1991) further discusses this bond and elaborates that transitional objects are supposed to help bridge the gap between the individual and a higher level of functioning. Therefore, it would be considered unhealthy if the transitional object was used forever as the individual is supposed to slowly phase it out (Cwik, 1991). The main pet discussed in the research examined within this study are dogs, and dogs have a significantly shorter lifespan than humans. Even if an individual wished to fully rely on a dog as their transitional object for the rest of their life, they would not be able to do so. This helps force the individual to use all of the coping skills they learned with their pet and reach a higher level of independent functioning (Cassidy & Shaver, 2002).

There has been limited research looking specifically at an inmate's attachment relationship with their pets when they are in a prison animal program (or PAP). Aufderheide's (2016) thesis examined 37 inmate dog handlers (27 males, 10 females) at the Fort Dodge Correction Facility who were working with training their dog to pass a service dog certificate test. The inmates had spent, on average, 5.4 years enrolled in the PAP. The study used mixed methods, and the author gave asked each inmate to fill out the 1965 Rosenberg Self-Esteem Scale, a modified version of the Lewandowski and Aron Self-Expansion Questionnaire, and the Feelings Towards Dog in Training Interview (Aufderheide, 2016). Inmates who had never

previously been enrolled in a PAP showed more positive results versus inmates who had previously been enrolled in a PAP. However, the exact effect size or data regarding this outcome was not given (Aufderheide, 2016). Another result was dogs had the same effects (e.g., dogs are calming, dogs make me feel better, dogs help me manage my emotions better, dogs provide me comfort) on the inmates as their close friends or relatives. Aufderheide (2016) theorized, that based on previous literature, the dog and dog handler connection was consistent with a secure relationship of two humans. Another study followed three previously incarcerated individuals at a prison in North Carolina and examined the type of relationship they had with their dog while they were in a PAP using the Lexington Attachment to Pets Scale (Weaver, 2015). All three participants had a secure relationship with their pet dog while they were engaging in the PAP (Weaver, 2015). Weaver (2015) compared their sample size of three to the national average according to the Bureau of Justice Statistics. A rank-sum statistical analysis was used due to the small sample size, and the results showed a significant decrease in their recidivism once being released from prison after enrolling in a PAP (0.0% vs 76.6%). None of the participants had been charged with any crimes up to five years upon release. The author had hoped to compare different types of inmate attachment styles with their PAP dogs, but they were unable to get a sample size large enough.

In summary, people's pets have an important role with attachment theory as they function as a part of an attached relationship. When that relationship is secure, it helps the individual feel more secure to explore their world, less anxious, and more likely to trust others and develop healthy relationships. In addition, the individuals can rely on their dog as a transitional object to help bridge the gap between where they are currently and a potentially higher level of

functioning. This higher level of security could be a factor in reducing recidivism and providing other beneficial effects for inmates and their pet dogs.

Empathy

The importance of empathy within a community is integral as it a vital foundational stone to every society keeping its members interconnected and close with one another (Segal et al., 2017). There are several definitions of empathy within psychological research as the interest in examining empathy within humans has heightened greatly over the recent years (Segal et al., 2017). Batson (2009) reviewed several psychological and neuropsychological research studies and examined what different researchers defined as empathy. He combined the most used concepts into one definition that appeared to fit what the majority of research studies were defining as empathy: "one person can come to know the internal state of another and can be motivated to respond with sensitive care" (Batson, 2009, p. 4). Empathy has such an important impact in society that there are over two thousand research studies focusing on how to increase empathy in counseling client populations (Butters, 2010).

Empathy is considered a key component in looking at recidivism rates for individuals who are released from correctional facilities (Kratcoski & Kratcoski, 2017; Wooldredge & Smith, 2018). This is because there is strong evidence that the more empathy an individual has towards others the less likely they are to commit additional crimes upon their release (Kratcoski & Kratcoski, 2017; Wooldredge & Smith, 2018). One research study with a between-subjects design, followed three groups of adolescents who had been placed on juvenile probation over a 12-month time period (Lawing, Childs, Frick & Vincent, 2017). There was no demographic information provided for the individual groups, but the overall sample was a total of 505 adolescents who were 95% male, 74% African American, 24% Caucasian, and the mean age was

15.43 years. The sample was divided into violent offences (48%), sexual offences (5%), and nonviolent offences (47%). The participants were given the Structured Assessment of Violence Risk (SAVR) to assess for many factors including empathy (Lawing, Childs, Frick & Vincent, 2017). Each group was followed up 12 months later to see if they had reoffended within that time frame (Lawing, Childs, Frick & Vincent, 2017). A Cox regression analysis showed that a low empathy score on the SAVR resulted in a 49% increase in the likelihood of recidivism ($\beta = 1.49$, $p < .01$). Lack of empathy was so important that the authors recommended juvenile offender programs should consider an empathy course or having mental health professionals work specifically to increase empathy (Lawing, Childs, Frick & Vincent, 2017).

Another recent study looked at intimate partner violence and alcohol abuse (Romero-Martinez et al., 2016). One hundred and sixteen individuals who had been charged with intimate partner violence were recruited for a between-subjects study (Romero-Martinez et al., 2016). However, it should be noted that 80 participants were excluded from the statistical analysis because they either did not show to the second neurology appointment or they did not finish the intervention. Each participant had been sentenced to less than two years in prison and attended a mandatory 30-week treatment program that focused on substance use reduction, empathy development, perspective taking, and cognitive flexibility (Romero-Martinez et al., 2016). Compared to a control group of people matched with the same demographic variables, the participants who went through the entire treatment program were observed having higher cognitive and emotional empathy ($F_{(1, 88)} = 4.03$, $p = 0.048$. Even further, those that had higher empathy rates had a significantly lower rate of recidivism ($r = -0.205$, $p < 0.01$) (Romero-Martinez et al., 2016). Hanson (2003) asserted that in order to have the most impact, empathy development programs in correctional facilities should target traits where the perpetrator has

deficits in areas such as victim empathy, caring relationships, or perspective taking. Once the focus on individual deficits is completed, then improving overall empathy of the offender will reduce recidivism.

A meta-analysis examined 38 different research studies which all looked at the effect on empathy and recidivism (Van Langen et al., 2014). Between all the studies a total of 6,631 (of the reported genders 4,054 were men and 594 were women) participants were examined and the strongest effect size found was cognitive empathy (d = .43). Cognitive empathy is a person attempting to understand another's emotional state. This had the largest impact on reducing the likelihood of a participant getting another charge after release from a correctional facility (Van Langen et al., 2014). Another group of researchers used a meta-analysis design to examine the role that empathy had with reoffending between a total of 35 studies (Jolliffe & Farrington, 2004). Most studies used in the meta-analysis described the gender ratio of their sample, but a few used the term "inmates" and did not disclose the gender (Jolliffe & Farrington, 2004). There were at least 567 male inmates and 139 female inmates used the meta-analysis (Jolliffe & Farrington, 2004). The results showed a small effect (d = .27) with low cognitive empathy and recidivism which means individuals who scored low on the Hogan Empathy Scale, the Questionnaire Measure of Emotional Empathy, or the Interpersonal Reactivity Index were more likely to commit a crime when they were released from their original correctional facility (Jolliffe & Farrington, 2004). However, one interesting result from the meta-analysis was that people who scored high on the empathy assessment had a weak effect (d = .14) in relation to recidivism. This could mean that there is a ceiling effect for empathy, and once a certain amount of empathy is reached the effect is significantly weakened (Jolliffe & Farrington, 2004).

There appears to be one flaw in the literature review with empathy assessments. Some treatment interventions are targeted at specifically increasing victim empathy, which possibly has only a short-term effect which deteriorates once the participant is released from prison (Brown, Harkins & Beach, 2012). According to Brown, Harkins and Beach (2012), victim empathy, an individual's view on how their behavior has impacted their victim, has been involved in most empathy programs in prisons because it has a high face validity. The authors examined 167 adult male sex offenders who completed the Core Sex Offender Program and the Victim Empathy Scale while being enrolled in a prison empathy program. Right after the program ended, there was a significant increase in scores between pre and posttest ($t = 2.56$; $df = 68$; $p = .013$) using a Kaplan-Meier survival analysis. However, after a 10 year follow up those scores significantly decreased ($t = 3.48$; $df = 17$; $p = .001$) to around their pre-test score. The conclusion of the study was the participant's empathy increased directly after the program, but their empathy decreased to their pre intervention score over the course of 10 years.

Mann and Barnett (2013) broke down the results of three meta-analyses all looking at the results of treatment programs targeting at reducing recidivism through increasing empathy. Overall, 161 studies were included within the analysis for a total of 37,415 participants. An exact demographic breakdown of the participants was not included within the study, but the authors reported the majority were male and about five thousand had been convicted of a sexual offense (Mann & Barnett, 2013). The authors found that victim empathy programs had a wide variance of results with some producing positive results ($d = .19$), some had no effect ($d = .03$), and some programs participants had higher rates of recidivism ($d = -.08$). The authors suggested that treatment programs should change to increase empathy in general and have less of a focus of increasing specifically victim empathy (Mann & Barnett, 2013). It is possible general empathy

treatment programs in prison have too much of a focus on victim empathy which is reducing their overall effect.

Improving Empathy with Animals

There is research looking at the connections between animal interactions and increasing empathy, but it is difficult to assess for causality (Pichot, 2013). Rigorous studies that address causality and not correlation usually randomly assign participants to a control group and an intervention group. However, there are ethical and methodological issues with giving participants a pet to have a relationship with (Pichot, 2013). One way to potentially evaluate causality between animal ownership and empathy is with classroom studies. An animal can be randomly assigned to a classroom of children and then removed without as many ethical and methodological concerns (Ascione & Weber, 1996; Daly & Morton, 2006). An early study looking at pet ownership and empathy found that those who owned a cat or dog scored higher on an empathy assessment than individuals who did not own a pet (Daly & Morton, 2006). The authors asked 155 Canadian elementary students to complete the Lexington Attachment to Pets Scale and the Pet Attitude Scale (Daly & Morton, 2006). They were then categorized into age groups of 8-10, 11-12, or 13-14 for their scores to be analyzed. While there was no significant difference in empathy between age groups ($F_{(2,123)} = 0.788$, $p > 0.1$), there was a small correlation ($r = 0.26$, $p < 0.025$) between pet ownership and empathy. The results also demonstrated that the more pets the children interacted with at home, the more empathetic they were towards other people ($F_{(2,124)} = 3.35$, $p < 0.025$). Another study examined undergraduate student's relationships with their pets (Taylor & Signal, 2005). One hundred and ninety-four participants were recruited to take the Interpersonal Reactivity Index and the Animal Attitude Scale, and then students were divided into two groups of pet owners and non-pet owners (Taylor

& Signal, 2005). A statistically significant independent t-test demonstrated ($t = 2.011$, $p < 0.05$) that people who owned a pet had higher levels of empathy than people who did not own a pet. These studies are supported by similar research papers that also suggest pet ownership has a positive correlation with scores on empathy assessments in both children and adults (Ascione & Weber, 1996; Poresky, 1990; Signal & Taylor, 2007; Sprinkle, 2008). Most of the results show that the stronger the relationship the owner has with the pet, the higher their empathy (Poresky, 1990; Signal & Taylor, 2007).

The majority of the studies that look at the relationship between animal ownership and empathy are focused on classrooms or children. This may be because it is easier to put classrooms into a control and intervention group, and it would be extremely difficult to ask a group of adults to start living with a pet. One of the most notable studies developed a school-based violence intervention program which involved having children interact with shelter dogs in an attempt to increase their empathy (Sprinkle, 2008). In addition to using self-report data, the researchers were able to use incidence reports from the school and any behavioral problems that occurred during school hours (Sprinkle, 2008). Over 300 students from three grades participated in this intervention. A pretest and posttest score were used in a multivariate analysis of variance, and if the student was exposed to the shelter dog intervention, they scored significantly higher on the Index of Empathy for Children and Adolescents and participated in fewer aggressive behaviors during school hours (Wilks's Lambda = .47, $F = 17.94$, $p = .000$). Another study used a similar research design where the researchers used a year-long animal intervention program at a school to specifically target children's empathy towards their classmates (Ascione, 1992). In total, the majority of school children benefited from the intervention and scored higher ($F_{(1,12)} = 4.98$, $p < .05$) on the empathy posttest after completing the yearlong intervention program. The

only notable exception was the students in first grade who did not have a significant difference in empathy scores. The authors provided little explanation besides the students may have been too young for the intervention to have worked (Ascione, 1992).

Conclusion

Humans' relationships with dogs have been growing ever since humans started to gather in large groups (Germonpré, 2009). Currently, pet owners report they gain multiple benefits from having their pet as a member of their household. Pets appear to reduce their owners stress, help comfort their owner in times of need, and provide incentive for their owner to be social (Fine, 2019; González-Ramírez, 2018, Yabroff et al., 2008). Research shows that the more secure the relationship the owner has with their pet, the more benefits they tend to get out of the relationship (Zilcha-Mano, Mikulincer & Shaver, 2011). Animals in therapy lead to the development of the first PAP which was made to help inmates gain a sense of self and decrease recidivism (Kohl, 2012). PAPs are available throughout the United States and typically they pair an inmate with a shelter dog. That inmate will be tasked with taking care of the shelter dog or training it to make it more adoptable for a permanent home. There is plenty of research to suggest that PAPs lead to a significant reduction in recidivism and a significant increase in multiple psychological factors such as happiness, self-esteem, and connection with the community (Furst, 2006; Han et al., 2018). Initial research looking into the relationship between the inmate and the animal they are taking care of indicates that a secure relationship may provide the most long-term benefits for inmates (Weaver, 2015). In addition, there is ample research suggesting that having a relationship with a pet can improve one's ability to empathize with others thus lead to a reduction in recidivism as well (Kratcoski & Kratcoski, 2017; Wooldredge & Smith, 2018). Therefore, an approach looking at both a former inmate's relationship with their

pet and their ability to empathize with other people may provide some needed research in the field.

Chapter 3: Method

The following study explored if dog ownership among people who have previous convictions positively correlated with a decrease in recidivism and an increase in an ability to empathize with other individuals. This was assessed by exploring prior incarceration status, pet ownership, examining if that pet relationship is secure, anxious, or ambivalent, and asking the participants to complete an empathy and risk of recidivism questionnaire. In addition, this study examined if different pet dog attachment styles are associated with a higher ability to empathize with other people or a reduced risk of recidivism.

Research Hypotheses

1. Pet dog ownership will be associated with a lower risk of recidivism (as measured by the Salient Factor Score 98) for individuals with a history of incarceration.
2. A formerly incarcerated individual with a secure attachment to their pet (as measured by the Pet Attachment Questionnaire) will have a greater correlation with the Salient Factor Score 98 (SFS 98) versus an individual with an anxious, ambivalent, or fearful attachment style to their pet dog.
3. Individuals who have been previously incarcerated who have a pet dog will have higher empathy (as measured by the Brief Interpersonal Reactivity Index) than individuals who have been previously incarcerated who do not have a pet dog.
4. Individuals who have a secure relationship with their pet, using the Pet Attachment Questionnaire (PAQ), will score higher on the Brief Interpersonal Reactivity Index (B-IRI) versus those that have either an avoidant, anxious, or fearful attachment style with their pet dog.

Participants

The final sample consisted of 306 participants. In order to participate in the study, they needed to acknowledge the Institutional Review Board (IRB) Information Letter. They also needed to indicate they were willing to participate in the study. Each participant was required to fit the inclusion/exclusion criteria as described below.

Predicted sampling size and statistical power. Sullivan's (2016) power analysis equation yielded a recommend sample size of 240. This would be sufficient to reach a power of .90 which is needed for minimal statistically significant results for a multi-regression analysis required for the Hayes PROCESS macro.

Statistical analyses. Hypothesis 1.1 examined if pet dog ownership was associated with a lower risk of recidivism. This was done by comparing two independent groups (pet ownership and SFS-98 scores). Thus, an independent samples t-test was used for the statistical analysis as it is the most robust test to use when comparing means from two independent groups with only two levels (Shannon, 2014). Hypothesis 1.2 investigated if participant's pet attachment style had an impact on their recidivism score. In this hypothesis, the independent variable, pet attachment style, had four levels and the means were compared to the participant's SFS-98 score. Therefore, a one-way analysis of variance (ANOVA) was used to see if the groups had any significant differences (Shannon, 2014). Hypothesis 2.1 explored if the participants with a pet dog would score higher on the B-IRI empathy measure versus participants who did not have a pet dog. The participant's pet ownership status was compared to their SFS 98 scores, so an independent samples t-test was used (Shannon, 2014). Lastly, hypothesis 2.2 studied if participant's pet attachment style had an impact on their empathy score. The independent variable, pet attachment style, had four levels and the dependent variable, B-IRI score had two levels which was the same

design as hypothesis 1.2. Thus, an ANOVA was used as the statistical test (Shannon, 2014). Finally, to produce a predictive model, a Hayes PROCESS macro was used to examine the variables for meditation using a conditional process model (Hayes, Montoya & Rockwood, 2017). Within this model the predictor variable was pet ownership, the mediator variable was empathy, and the outcome variable was risk of recidivism. See Figure 2 for a visual representation.

Inclusion/Exclusion criteria. The following study was intended to examine the effects that pet ownership had on empathy and risk of recidivism in people who have been previously incarcerated. Therefore, in order to have been eligible to participate in the study, the participant needed to have been charged with a crime and then spent a period of time in jail, prison, or correctional facility. Previous research examining recidivism define a crime as any violation of the law in which the individual is convicted of the violation (Cooke, 2014; Fournier & Winston, 2019). Secondly, since the majority of research looking at animals and recidivism is focused on dogs, the participant needed to have a pet dog at the time of the study (Fine, 2019). They also needed to identify as being the primary caregiver to the dog, so the relationship between owner and pet can be fully explored. Attachment theory suggests that it takes about seven months for an adult to form an attachment style within an interpersonal relationship (Gillath, Karantzas & Fraley, 2016). Therefore, the participants needed to have their pet dog for at least seven months to qualify for the study. In addition, they could not have a history of being enrolled in a prison animal program (PAP). Lastly, the participant needed to pass the validity questions that were randomly placed in between the assessments. These questions both addressed the attention of the participant and helped exclude individuals who may not have been incarcerated in the past. Each

participant who completed the study was given the IRB information letter, demographic questionnaire, empathy assessment, risk of recidivism assessment, and the validity questions.

Sampling method. Amazon Mechanical Turk (MTurk) was used to recruit the participants for this study. MTurk was chosen because it has a high volume of individuals with diverse demographics including people across the United States who have a history of incarceration (Arrin, 2019). The participants were paid $2.40, before MTurk fees, if their response was deemed valid. A review of the available MTurk projects showed this was an average pay per task for MTurk for a study of this length, which helped promote participants to engage in the study while not providing exceeding compensation which may have increased invalid responses. A SERC Student Research Grant Seed of $960 was awarded in order to help provide funding.

Sample characteristics. Demographic analyses were run in order to examine various individual characteristics such as gender, age, ethnicity, region, type of crime incarcerated for, and the amount of time spent in a correctional facility. No significant demographic differences were noted in the literature review and in the sample group. Full demographic information of the participant study pool is located in Table 1.

Measures

Demographic information. Demographic questions relating to the participant's background including gender, age, ethnicity, region were asked. In addition, the amount of time spent in a correctional facility, if they were the primary caregiver of the pet, and number of years spent with that pet were asked using the demographic questionnaire. Each participant was also asked if their charge was a violent offense, a sexual offense, or a non-violent non-sexual offense.

Participant and pet relationship. The relationship the participant had with their pet was measured by the Pet Attachment Questionnaire (PAQ). The assessment is a 26-item questionnaire which measures the type of relationship (secure, anxious, avoidant, or fearful) the individual has with their pet. The PAQ uses a 7-point Likert scale with the anchors at 1 = "Disagree Strongly" to 7 = "Agree Strongly." The PAQ uses adult attachment theory as its theorical foundation for its subscales, so the two subscales on the assessment are avoidance and anxiety (Zilcha-Mano, Mikulincer & Shaver, 2011). The odd numbered questions measure the avoidant dimension (i.e. "Being close to my pet is pleasant for me") of the relationship while the even numbered questions measure the anxiety dimension (i.e. "Signs of affection from my pet bolster my self-worth") of the relationship. If the participant had a high score (46 and above) on items measuring the avoidant dimension they were classified as having an avoidant relationship style. If the participant had a high score (46 and above) on items measuring the anxiety dimension they were classified as having an anxious relationship style. If the participant had low scores (45 and below) on both the avoidant and anxiety dimensions they were classified as having a secure relationship style, and if they had high score on both the avoidant and anxiety dimension they were classified as having a fearful relationship style.

A factor analysis of those two dimensions showed evidence that both anxiety and avoidance had eigenvalues greater than 1.0 and explained about 41% of the item variance (Zilcha-Mano, Mikulincer & Shaver, 2011). Another study within the Zilcha-Mano, Mikulincer and Shaver (2011) article had 50 pet owners take the PAQ twice at six-month intervals. The authors found the PAQ had a test-retest reliability ranging from .86 to .89 providing evidence of reliability. Langston (2014) provided more evidence for the PAQ's English version validity. The author used the instrument with a sample of 561 pet owners. Of the total 85.7% were women

with a mean age of 22.71 years. No information about incarceration status of the participants was collected. Langston (2014) was examining the effects that pet attachment style had on pet owner's sense of well-being. Using the PAQ, the results indicated that pet attachment anxiety was significantly correlated with adult attachment anxiety (r = .50, $p < 0.01$) and negative affect ($r = .32$, $p < 0.01$). In addition, a recent research study used the PAQ to examine pet owner's relationships with their cats and discuss how people's scores on neuroticism and conscientiousness impacted their relationship (Reevy & Delgado, 2020). There was a total of 1,239 valid results who were mostly female (87.5%) and Caucasian (86.9%). There was no information reported about their incarceration status. Reevy & Delgado (2020) found an internal consistency of $\alpha = 0.80$ for the items on the anxiety scale and $\alpha = 0.86$ for items on the avoidance scale which are similar to the results Zilcha-Mano, Mikulincer and Shaver (2011) reported.

Empathy. The Interpersonal Reactivity Index (IRI) measures an individual's ability to empathize with other people. The assessment is a 28-item questionnaire which uses a 5-point Likert scale with the anchors at 1 = "Does not describe me well" and 5 = "Describes me very well." The assessment contains four scales including perspective taking, empathic concern, personal distress, and fantasy. Perspective taking measures the ability to see life through other people's eyes ("I try to look at everybody's side of a disagreement before I make a decision"). Empathic concern assesses the capacity an individual must experience feelings of sympathy towards people in less fortunate conditions ("I often have tender, concerned feelings for people less fortunate than me."). Personal distress measures how well an individual can sense negative emotions in response to being around other people feeling negative emotions ("In emergency situations, I feel apprehensive and ill-at-ease."). Lastly, fantasy assesses the ability to imagine oneself in another situation ("I daydream and fantasize, with some regularity, about things that

might happen to me."). The four scales combined into one empathy score which was used in the analyses.

Davis (1980) stated perspective taking and fantasy tend to measure cognitive empathy, the ability to see put yourself into another person's perspective. While the empathic concern and personal distress scale tend to measure affective empathy, the ability to comprehend other people's emotions and respond accordingly (Davis, 1980). Davis initially used a sample of 589 male and 582 female undergraduate students at the University of Texas at Austin to access the reliability and validity of the IRI. Davis (1980) used a Joreskog factor analysis and found standardized alpha coefficients of .78 (males) and .75 (females) for fantasy, .75 (males) and .78 (females) for perspective taking, .72 (males) and .70 (females) for empathic concern, and .78 (males) and .78 (females) for personal distress. This means the items in each four-subscale load heavily on their assigned subscale and are measuring unique aspects of empathy. In addition, Davis (1980) also examined the IRI's test-retest reliability. A sample of 56 males and 53 female undergraduate students at the University of Texas at Austin were recruited to take the IRI a first time and then a second time 60 to 75 days later. The lowest test-retest reliability coefficients reported were in the perspective taking scale (.61 males, .62 females) and the highest test-retest reliability coefficients reported in the fantasy scale (.79 males, .81 females).

However, when the IRI was given to prison populations there appeared to be threats to both validity and reliability (Beven, O'Brien-Malone & Hall, 2004). A total of 88 violent offenders (gender not reported) at a maximum-security prison were given the IRI (Beven, O'Brien-Malone & Hall, 2004). The researchers reported items for each of the four subscales were often not correlated with one another. A corrected item-total correlation was used and an item scoring above .30 indicates the item is providing evidence towards the internal consistency

of the assessment. However, nine total items scored below .30 showing caution should be used with using the IRI in populations with offenders (Beven, O'Brien-Malone & Hall, 2004). This discrepancy between the reliability and validity in undergraduate students used in Davis's initial sample versus a sample of offenders has been noted by other authors (Ingoglia, Lo Coco & Albiero, 2016; Lauterbach & Hosser, 2007). All researchers agreed that the potential reason for this discrepancy was offender populations tended to have lower verbal skills, thus had difficulty answering negatively worded items on the IRI (Ingoglia, Lo Coco & Albiero, 2016; Lauterbach & Hosser, 2007). To address this issue Ingoglia, Lo Coco and Albiero (2016) developed the Brief Form of the Interpersonal Reactivity Index (B-IRI). The B-IRI has the same subscales as the IRI but with four items in each subscale rather than seven items (Ingoglia, Lo Coco & Albiero, 2016). In addition, the B-IRI does not contain any negative items which makes the assessment easier to answer for individuals with a lower verbal skill. The authors used a confirmatory factor analysis to examine how well each item fit onto its corresponding subscale (Ingoglia, Lo Coco & Albiero, 2016). The goodness-of-fit (χ^2) indexes showed the items tended to fit each subscale χ^2 (98) = 344.89, SB χ^2 (98) = 271.76, $p < .001$. Lauterbach and Hosser (2007) adjusted the IRI to a shortened version which is nearly identical to the B-IRI, except Lauterbach and Hooser (2007) used a 4-point scale to avoid having an error of central tendency. They asked 839 prison inmates (mean age = 20.7, gender not reported) with an average prison sentence of 15.8 months. At the time of the study 64% of the sample had not graduated from high school (Lauterback & Hosser, 2007). The authors reported the internal consistency, using Cronbach's alpha, for each scale as .63 for personal distress, .66 for fantasy, and .77 for both perspective taking and empathic concern. In addition, the authors used the corrected item-total correlations to access how each item scaled with its intended subscale (Lauterback & Hosser,

2007). The only items that scored below .30 were reversed items, which when unreversed, scored above .30. The authors suggested this provided evidence to show that reserved items and negative questions were the items on the original IRI which gave concern for the offender population (Lauterback & Hosser, 2007).

Recidivism. The risk that the participant has for reoffending was measured by the Salient Factor Score 98 (SFS-98). The assessment is a 7-item survey which measures the likelihood that a person will reoffend after being convicted of a crime (Hinojosa et al., 2005). Each question has multiple answers that measure factors such as the total number of convictions the participant has, the age of last offense, and if they have violated probation. A low score indicates a higher likelihood of recidivism, and a higher score indicates a low likelihood of recidivism (Hinojosa et al., 2005). A score of 0-5 indicates a high risk of recidivism, a score of 6-8 indicates a medium risk of recidivism, and a score of 9-11 indicates a low risk of recidivism (Hoffman & Beck, 1980).

Hoffman and Adelberg (1980) examined each item in the SFS-98 for its construction validity. Two thousand one hundred and forty-nine participants were recruited after being released from a Federal prison (Hoffman & Adelberg, 1980). Each participant filled out the SFS-98 and each item tested for its predictive validity. Every item (1 = ($X^2 = 75.5$, $p < 0.0001$), 2 = ($X^2 = 102.4$, $p < 0.0001$), 3 = ($X^2 = 85.2$, $p < 0.0001$), 4 = ($X^2 = 82.9$, $p < 0.0001$), 5 = ($X^2 = 80.3$, $p < 0.0001$), 6 = ($X^2 = 8.2$, $p < 0.005$), 7 = ($X^2 = 5$hypo, $p < 0.0001$) was able to significantly able to predict whether the participant reoffended within a one to two year follow up (Hoffman & Adelberg, 1980). Hoffman and Beck (1980) examined the validity of the SFS-98 using a sample group of 1,260 individuals released from prison. No further demographic data on the sample group was provided. The authors found that, over a one-year time, the SFS-98 was

correct in 68-72% of participants who took it. In addition, a mean cost rating was run for participants who were released in 1970 (0.36), 1971 (0.37), and 1976 (0.34) which indicates the SFS-98 has sufficient predictive qualities on multiple cohorts so cohort differences are not significant.

In a recent study, the SFS-98 was tested on a sample size 360 (292 males, 68 females) participants who were recently released from prison (Ferguson, 2016). All the participants had been charged with a minor offense. The author found a prediction rate of 75% on a 223 day follow up which was a statistically significant result ($\chi 2$ (1, N = 360) = 12.58, $p < .05$). In addition, the sample had an area under the curve analysis of .68 (Ferguson, 2016). An area under the curve of greater than .60 is considered better than chance which provides more evidence of the validity of the SFS-98 (Ferguson, 2016). Another researcher tested the SFS-98 with a 1,205-participant study group (Harer, 1995). There was a total of 1,069 males and 136 females (Harer, 1995). Most of the participants had first offense charges related to damage to property or harming another person, and the most common re-offenses were related to drugs (25%), parole violation (15%), or larceny (12%). Harer (1995) found the SFS-98 was a good predictor of recidivism as 17.4% of the low-risk group reoffended and 71.4% of the high-risk group reoffended. An ordinary least squares regression showed the SFS-98 was statistically significant at predicting recidivism (y = 0.0336, $p = 0.0127$).

Validity Measures

There was no available literature discussing how to validate if someone has been incarcerated. Therefore, there were three questions randomly placed throughout the series of assessments which inquired about correctional setting vernacular. Participants needed to answer at least two out of the three questions correctly for their assessment to be considered valid. This

also served as a way to make sure the participants are not answering randomly. A 2017 paper discussed how inmates in United States prisons communicate with one another (Dziedzic-Rawska, 2017). Dziedzic-Rawska (2017) citied the website https://prison-slang.com/ in their research as being a creditable source to obtain words individuals in prisons and jails frequently use. The participants were asked three multiple-choice questions asking how "C.O." (correctional officer), "P.O." (probation officer), and "seg" (segregation) were defined within a correctional setting.

Procedure

After IRB approval was granted, the MTurk task was launched, and participants were able to enroll in the study task. Participants needed to read through the IRB Information Letter before proceeding to the assessment questions. The participants first answered demographic questions to demonstrate eligibility for the study assessments. Then the questionnaires were shown in a randomized order to prevent order effect to increase internal validity (Kazdin, 2016). At the end of the survey, the participants were given credit for participation if their response was deemed valid.

Chapter 4

Results

Dogs have been used as therapeutic aids since the 1960s (Levinson, 1962). Research has shown that people gain several benefits from having a pet dog including gaining empathy towards others and helping to end the cycle of incarceration (Ascione, 1992; Dell et al., 2019; Hill, 2018; Sprinkle, 2008). One possible explanation for these effects is understanding the human animal bond and the attachment style between owner and pet (Fine, 2019; Kogan & Blazina, 2018). This study examined the effect that dog ownership has on empathy and the participant's risk of recidivism. In addition, the participant's relationship attachment styles with their pet dogs were explored. The study's hypotheses asserted that having a pet dog would be associated with a reduced risk of recidivism and an increased level of empathy. Further, having a secure relationship with a pet dog, would be correlated with an even lower risk of recidivism and a higher level of empathy than other attachment styles.

Participants

The study was posted on MTurk, and a total of 341 participants submitted their responses. Thirty-four of the respondents were eliminated because they failed to answer two of the three validity check questions, so their responses were not deemed valid. One respondent was eliminated because they reported they had previously participated in a prison animal program. Fifteen participants were removed as data outliers. The final number of participants was 291 which was sufficient for the recommended sample size of 240 given by Sullivan's (2016) power analysis.

Most of the participants were between the ages of 26 and 45 (n = 170, 55.4%), identified as a man (n = 205, 70.4%), were Caucasian (n = 193, 66.3%), and lived in the Pacific West (n =

85, 29.2%). The participants with a legal history reported they either spent under one day in a correctional facility (*n* = 224, 77%), one day to one year in a correctional facility (*n* = 59, 20.3%), or longer than a year in a correctional facility (*n* = 8, 2.7%). In addition, the participants responded they had been arrested for either a nonviolent offense (*n* = 255, 87.6%), a violent offense (*n* = 33, 11.3%), or a violent sexual offense (*n* = 3, 1.0%). The current study's sample was consistent with previous research examining length of stays for incarceration. One research study with 75,203 participants found that the median incarceration length was one day (Camplian, 2019). Another recent paper noted that most people booked into correctional facilities were charged with a misdemeanor and spent less than a week in jail (Jorowitz & Velazquez, 2020). Full demographic information of the participant study pool is located in Table 1.

Table 1

Demographic Characteristics of Participants (n=291)

Characteristic	*n*	%
Age		
18 – 25	93	32
26 – 45	170	58.4
46 and older	28	9.6
Gender		
Man	205	70.4
Woman	86	29.6
Trans man	0	0

Trans woman	0	0
Gender non-binary	0	0
Other	0	0
Location		
Central	27	9.3
Midwest	34	11.7
Northeast	52	17.9
Pacific West	85	29.2
Southeast	59	20.3
Other	34	11.7
Ethnicity		
African American	22	7.6
Asian-American	51	17.5
Caucasian	196	66.3
Latino-a/Hispanic	17	5.8
Native American	6	2.1
Bi-racial/Multi-racial	2	.7
Length in Correctional Facility		
Under one day	224	77
One day to one year	59	20.3

Longer than a year	8	2.7
Offense Type		
Nonviolent	255	87.6
Violent	33	11.3
Violent Sexual	3	1.0

The participant's attachment style was assessed using their Pet Attachment Questionnaire (PAQ) scores for the avoidant and anxiety dimensions. If the participant scored less than 46 on both dimensions, they were placed in the secure attachment category. If they scored above a 46 on the avoidant dimension they were placed in the avoidant attachment category, if they scored above a 46 on the anxiety dimension, they were placed in the anxious attachment category, and if they scored above a 46 on both dimensions they were placed in the fearful attachment category. Most of the participants had a secure attachment with their pet dog (n = 209, 71.8%), some participants had an anxious attachment (n = 38, 13.1%), some participants had a fearful attachment (n = 32, 11%), and a few participants had an avoidant attachment (n = 12, 4.1%).

Initial Analyses and Testing for Assumptions

MTurk automatically de-identified the data before it could be exported. All data were then taken from MTurk and exported into an Excel document. Next, all data were transferred to Statistical Product and Service Solutions (SPSS) version 28.0.0.0 and all statistical tests were analyzed on SPSS. The Hayes PROCESS macro version 4.0 for SPSS was downloaded and used for additional analyses (Hayes, 2017). The dataset was examined for various irregularities which could contribute to a type I or a type II error. If such an error occurs, it would invalidate attempts

to examine the true effect the variables have on the outcome. Steps were done in order to ensure the data met all assumptions for the different statistical tests used in analysis.

The data's skewness and kurtosis were examined. The Brief Interpersonal Reactivity Index (B-IRI) had a moderate negative skewness of -.749 and a kurtosis of -.474 with a standard deviation of 18.921 and a mean of 50.893. The Salient Factor Score 98 (SFS-98) had an approximately symmetric skewness of -.299 and a kurtosis of -.751 with a standard deviation of 2.096 and a mean of 7.701. The kurtosis value with the SFS-98 scores showed the data had normal univariate distribution (George & Mallery, 2019). Both variables had had a platykurtic distribution demonstrating the data was spread out with flat tail ends (George & Mallery, 2019).

Missing Data

Datasets with missing data can be a widespread and significant problem to researchers (Baraldi & Enders, 2010). An examination of the dataset showed a missing data rate of 0%. The study was designed ensuring all participants must answer each question before moving on. Therefore, there were no patterns with missing data as all questions were answered, in their entirety, by all participants. There were no participants that began the study and stopped answering mid-way through.

Removal of Data Outliers

One of the most common techniques for removing data outliers is the standard deviation method (Bain & Engelhardt, 1992; Miller, 1990). Hawkes and Webb (1963) first introduced this method by stating that eliminating data, which was more than three standard deviations from the mean, was essential to running robust statistical analyses. Since the 1960s, the practice of using two standard deviations from the mean has gained popularity over the previous norm of three standard deviations from the mean (Cousineau & Chartier, 2010; Miller, 1990). Miller (1990)

noted that data sets that utilized the three standard deviation approach still had, seemingly, erroneous data which was potentially causing statistical bias. The author found that using a two standard deviation method helped provide a stronger representation of the data set as long as the sample size was greater than twenty. Bain and Engelhardt (1992) came to a similar conclusion noting that removing data, which was two standard deviations away from the mean, would help reject extreme data which may diminish from the statistical integrity of the research study. Another study found that the two standard deviation method would remove 5% of the data which appeared to fit the majority of the data sets observed, especially data sets with larger sample sizes (Amidan, Ferryman, Cooley, & 2005).

The current study utilized the two standard deviation outlier elimination technique which is aligned with current scientific literature. While there is some concern about removing statistical data, Bakker and Wicherts (2014) found that the removal of outliers did not lead to weaker statistical testing or a less robust conclusion. However, the authors did note that 41% of psychological studies examined did not appear to report the removal of outliers. The authors recommended if such methods are used, they should be fully transparent to the reader. Therefore, the strength of the study should not be weakened by removing data outliers, and the methods for removing the outliers are fully transparent to the reader. A total of 15 participants of the 306 total were removed from the sample. A visual review of sample histogram confirmed that the removed participant data were at the tail ends of the sample.

Homogeneity of Variances and Data Transformations

The independent samples t-tests and one-way ANOVA both require the assumption of homogeneity of variances (Delacre, Leyes, Mora & Lakens, 2019; Kim & Park, 2019). These analyses focus on the mean of data compared across two groups, which requires both groups to

have the same variance. If this assumption is not met, then the analysis cannot compare the two groups. The Levene's test of equality of variances has been used since the 1960s and is still considered a robust way of testing group's homogeneity of variances (Gastwirth, Gel & Miao, 2009). Therefore, a Levene's test was run to determine if the dataset had homogeneity of variances. The SFS-98 scores were normally distributed with a nonsignificant Levene's test result ($F = 1.174$, $p = .280$) indicating they fit the homogeneity of variances assumption required for parametric statistics. However, the B-IRI scores ($F = 23.52$, $p < .001$) had significant results indicating it did not have normality distributed data. The logarithmic transformation is widespread technique to improve data normality while maintaining the integrity of the data (Keene, 1995; Sedgwick, 2012). This technique is used to address data skewness while keeping the data in the same order. The B-IRI scores were transformed using the logarithmic transformation method, and the subsequent Levene's test results were insignificant ($F = 2.026$, $p = .157$) showing the transformation helped the variance of the data. All data met the assumptions required for parametric statistical testing.

Cronbach's Alpha

The Cronbach's Alpha of each assessment measurement used in the current study was calculated. This analysis is a measure of an assessment's internal consistency, which is a form of reliability examining the inter-relatedness of the items of each construct (Tavakol & Dennick, 2011). The B-IRI has four subscales consisting of empathic concern, fantasy, personal distress, and perspective taking. The Cronbach's Alpha was .876 for the total B-IRI, .796 for the empathic concern scale, .667 for the fantasy scale, .716 for the personal distress scale, and .728 for the perspective taking scale. The results for the overall B-IRI provided ample evidence for the internal consistency of the reliability with the current study's sample. The empathic concern,

personal distress, and perspective taking scales showed acceptable evidence while the fantasy scale provided questionable evidence. These results are consistent with previous studies examining the internal consistency of the assessment (Davis, 1980; Lauterback & Hosser, 2007).

The PAQ is comprised of an anxiety and avoidant dimension. The Cronbach's Alpha for the total questionnaire was .967 which showed strong evidence for the internal consistency of the assessment with the study's sample. The results from the avoidant scale were .948 and the anxiety scale was .936. Previous research examining the internal consistency of this questionnaire found results between the ranges of .80 and .89 (Reevy & Delgado, 2020; Zilcha-Mano, Mikulincer & Shaver, 2011). Therefore, this study provided stronger evidence for the internal consistency of the questionnaire. The Salient Factor Score 98 (SFS-98) only has one category which has shown strong evidence of its predictive qualities (Ferguson, 2016; Harer, 1995; Hoffman & Adelberg, 1980). The results from the Cronbach's Alpha were an overall score of .804 showing the sample had good internal consistency within the current study's sample.

Statistical Analyses

This study utilized a between-subjects research design. The primary analyses used were an independent samples t-test and a one-way analysis of variance (ANOVA). An independent samples t-test compares the means between two independent groups (Ross & Shannon, 2011). The ANOVA compares the means between two or more independent groups with two or more levels. Hypotheses 1.1 and 2.1 involved comparing two independent groups so the independent samples t-test was utilized. Hypotheses 1.2 and 2.2 used attachment style as a variable that has four different levels (secure, anxious, avoidant, and fearful) therefore an ANOVA statistical test was used. Finally, a Hayes PROCESS macro (HPM) was run to determine a meditation model for the variables pet ownership, empathy, and risk of recidivism. The alpha level of .05 was used

as the statistically significant cut off as .05 is the recommended ceiling for the independent samples t-test, the ANOVA, and the Levene's test for equality of variances (Ross & Shannon, 2011).

Hypothesis 1.1. Participants with a legal history who have a pet dog will have a lower recidivism SFS-98 score than participants with a legal history who do not have a pet dog. An independent samples t-test was used with SFS-98 as the dependent variable and the participant's pet ownership status as the independent variable. The Levene's test showed the assumption of homogeneity of variances was not violated, $F_{(1,289)} = 1.17$, $p = .280$. The independent samples t-test was statistically significant, $t_{(1,289)} = -2.701$ with a two-tail $p = .008$ significance score. The mean for the pet group ($M = 7.703$) was higher than the mean from the no pet group ($M = 6.845$). The results indicate participants with a legal history who have a pet dog have a significantly decreased risk of recidivism compared to participants who do not have a pet dog. Results of the independent samples t-test are shown in Table 2.

Table 2

Independent Samples T-Test for Pet Ownership and Risk of Recidivism

	M	*SD*
Pet Dog	7.703	2.112
No Pet Dog	6.845	1.973

Hypothesis 1.2. A one-way ANOVA was used to analyze the research hypothesis that participants who have a secure attachment with their dog have a lower risk of recidivism score than a participant's avoidant, anxious, or fearful attachment with their dog. The ANOVA test showed statistically significant results ($F_{(3,193)} = 2.909$, $p = .040$) indicating that SFS-98 scores

are significantly different based on the type of attachment the participant has with their pet. The secure group had a mean of 7.63, the anxious group had a mean of 6.14, the avoidant group had a mean of 5.00, and the fearful group had a mean of 6.84. The results were further examined to look at differences between the attachment styles. A Tukey HSD post-hoc analysis was run to show differences among the different groups. The results revealed participants with a secure relationship had a statistically significant higher SFS-98 score, which indicates a lower risk of recidivism, than participants with an anxious relationship (p = .048, 95% C.I. = [-.014, 2.980]). However, there were no significant differences between participants with a secure attachment and an avoidant attachment (p = .248, C.I. = [-1.060, 6.301]) or fearful attachment (p = .399, C.I. = [-.525, 2.100]). These findings suggest that participants with a secure relationship with their pet have a lower risk of recidivism compared to participants with an anxious relationship with their pet. Results of the ANOVA and post hoc comparisons are shown in Tables 3 and 4.

Table 3

One-way ANOVA Test for Pet Attachment Style and Risk of Recidivism

	Sum of Squares	Mean Square	*F*	Sig.
Between Groups	31.765	10.58	2.909	.040
Within Groups	291.223	3.64		
Total	322.988			

Table 4

Tukey HSD Post Hoc Comparisons

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error
Secure	Anxious	1.48*	.57

	Avoidant	2.63	1.40
	Fearful	.787	.50
Anxious	Secure	-1.48*	.57
	Avoidant	1.14	1.41
	Fearful	-.695	.52
Avoidant	Secure	-2.63	1.40
	Anxious	-1.14	1.41
	Fearful	-1.84	1.39
Fearful	Secure	-.787	.50
	Anxious	.695	.52
	Avoidant	1.84	1.39

*The mean difference is significant at the .05 level.

Hypothesis 2.1. Individuals with a legal history who have a pet dog will have a higher empathy score than individuals with a legal history who do not have a pet dog. Empathy scores were measured by the B-IRI. After data transformation, the B-IRI dataset met the homogeneity of variances assumption needed for an independent samples t-test. The independent samples t-test had a statistically significant result ($t_{(1,289)} = 2.040$) with a two-tail $p = .043$ test. The mean for the pet group ($M = 1.767$) was higher than the mean from the no pet group ($M = 1.741$). The results revealed that participants with a legal history who have a pet dog have a higher level of empathy compared to participants who do not have a pet dog. Results of the independent samples t-test are shown in Table 5.

Table 5

Independent Samples T-Test for Pet Ownership and Empathy

	M	*SD*
Pet Dog	1.767	.076
No Pet Dog	1.741	.089

Hypothesis 2.2. Participants who have a secure attachment with their dog will have a higher empathy score than participants with an avoidant, anxious, or fearful attachment with their dog. A one-way ANOVA was used to examine the hypothesis as the attachment style variable has four different levels. The ANOVA test did not reveal statistically significant results ($F_{(3,193)}$ = 1.837, p = .147) indicating empathy was not significantly impacted by the type of attachment style the participant had with their pet dog. A Tukey HSD post-hoc analysis further showed there were no significant differences in empathy scores between the attachment style groups. Results of the ANOVA and post hoc comparisons are shown in Tables 6 and 7.

Table 6

One-way ANOVA Test for Pet Attachment Style and Empathy

	Sum of Squares	Mean Square	*F*	Sig.
Between Groups	.031	.010	1.837	.147
Within Groups	.445	.006		
Total	.475			

Table 7

Tukey HSD Post Hoc Comparisons

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error
Secure	Anxious	-.041	.022
	Avoidant	.016	.055
	Fearful	-.039	.012
Anxious	Secure	.041	.022
	Avoidant	.057	.055
	Fearful	.001	.020
Avoidant	Secure	-.016	.055
	Anxious	-.057	.055
	Fearful	-.055	.054
Fearful	Secure	.039	.012
	Anxious	-.001	.020
	Avoidant	.055	.054

*The mean difference is significant at the .05 level.

Model (Hayes PROCESS Macro). A Hayes PROCESS Macro (HPM) was used to analyze the current study's data (Hayes, 2013). The HPM is a regression logistic path analysis tool which uses a conditional process model. This model uses an advanced regression-based approach which allows the examination of multiple effects on scientific variables. The HPM can be downloaded for free for SPSS at www.processmacro.org. HPM is a thoroughly researched statistical analysis, and it is widely used to answer questions involving meditation and moderation (Hayes, 2013; Hayes, Montoya & Rockwood, 2017). In order to use the HPM there are three assumptions the

data must meet (Stride, Gardner, Catley & Thomas, 2015). First, the primary independent variable must be continuous or dichotomous. The independent variable is pet ownership which is dichotomous between being a pet owner and not owning a pet. The second assumption is any potential mediator variables need to be continuous. The mediator variable is empathy which is measured on a continuous scale using the participant's B-IRI scores. The last assumption is the dependent variable which is also needs to be continuous. The dependent variable is risk of recidivism which is measured on a continuous scale using the participant's SFS-98 scores.

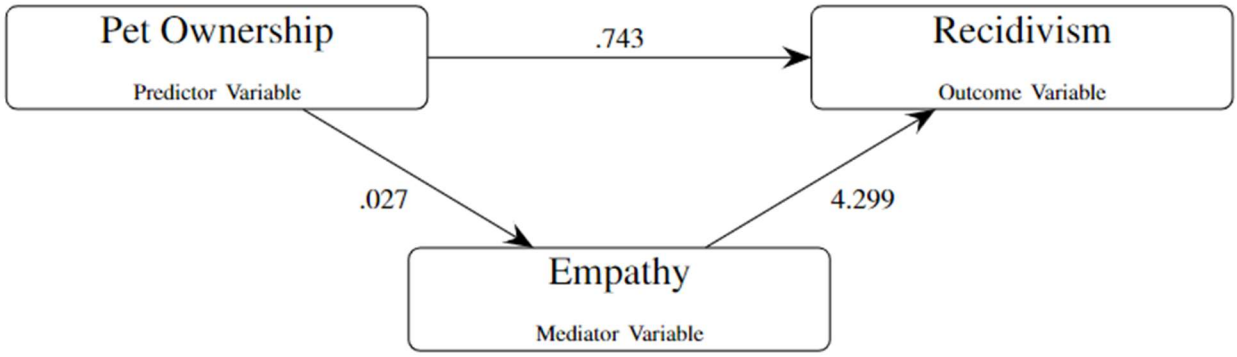
The current study's results provided a model which established the extent to which the predictor variable, pet ownership, impacts risk of recidivism, the outcome variable, through empathy, the mediator variable. The first step of the model examined the relationship between pet ownership and the participant's score on the SFS-98 which measured the participant's risk of recidivism. This is the model's direct effect between the predictor and outcome variables, and it ignores the mediating variable, empathy. The results showed this effect was statistically significant (b = .743, $t_{(2,194)}$ = 2.334, p = .021). The next step examined the regression with pet ownership on the participant's B-IRI scores for empathy which was also statistically significant (b = .027, $t_{(3,194)}$, = 2.041, p = .043). The third step of the mediation model revealed that the participant's B-IRI score, while controlling for pet ownership, was also statistically significant (b = .743, $t_{(2,194)}$, = 2.334, p = .021). The last step showed when the mediating variable, empathy, was controlled pet ownership was still a significant predictor of recidivism (b = 4.299, $t_{(2,194)}$, = 2.334, p = .027). Lastly, the unstandardized indirect effect was examined using the percentile bootstrap estimation approach with a total of 5000 samples. The results showed the indirect coefficient β = .115, SE = .076, 95% CI [.013, .292] and partially standardized β = .056. The bootstrapping approach's confidence interval did not include 0 which means the model had

evidence of a mediated relationship. The indirect effect of the model was .115 showing a small effect size.

Overall, this model examined the role that the meditating variable, empathy, had on the relationship between pet ownership and recidivism. The results of the HPM revealed a statistically significant effect of the impact that pet ownership had with risk of recidivism. In addition, there was a direct effect of pet ownership on the risk of recidivism variable while in the presence of the mediating variable, empathy. This indicates the relationship between pet ownership and risk of recidivism was partially mediated by the participant's empathy scores. See Figure 3 for a visual representation of the HPM mediating model with the variables pet ownership, risk of recidivism, and empathy.

Figure 3

Visual representation of mediating variable model after statistical analysis



Chapter 5: Discussion

A recent article showed The United States of America has the highest incarceration rate, per capita, in the entire world (Hamilton, 2021). In 2019, there were a total of 2.3 million people held in correctional facilities throughout the nation (Hamilton, 2021). Research examining The United States of America's recidivism rate is a matter of national concern. The emergence of prison animal programs (PAPs) has been a viable method to help break the cycle of incarceration. A review of the scientific literature shows strong evidence that inmates involved with PAPs gain many positive benefits including increased prosocial skills, a greater sense of community, lowered aggression, and increased self-esteem (Furst, 2019; Han et al., 2018; Humby & Barclay, 2018). Inmates involved in PAPs also showed an increase in empathy after participating in the program (Furst, 2019; Han et al., 2018). These positive effects are not limited to the correctional system. Some studies showed that bringing pets into a classroom environment helped children develop empathy towards both animals and humans (Ascione, 1992; Podberscek, Paul & Serpell, 2005; Sprinkle, 2008). The human animal bond could be a variable that explains some of these beneficial effects. Previous authors have used attachment theory as a foundation for examining the relationship between humans and their pets (Cassidy & Shaver, 2002; Zilcha-Mano, Mikulincer & Shaver, 2012). In fact, Meehan, Massavelli and Pachana (2017) theorized that pets fulfilled all four characteristics of a secure attachment which includes providing a safe haven, a secure base, implementing proximity maintenance, and bringing about separation distress.

The current study sought to further examine the human animal bond, pet owner's attachment styles, participant's level of empathy, and their risk of recidivism. It was hypothesized that pet dog ownership would be associated with a lower risk of recidivism, and

participants with a secure pet attachment style would have a significantly lower risk of recidivism than the other three attachment styles. In addition, pet dog owners would score significantly higher on an empathy assessment compared to non-pet owners. Furthermore, participants with a secure attachment style would score significantly higher on an empathy assessment than the other three attachment styles. There are several scientific studies looking at each variable, but there is a lack of research examining each of the above factors combined. Specifically, there is a scarce amount of literature inspecting how people's attachment styles with their pets may be correlated with their empathy and risk of recidivism. This study provides a Hayes PROCESS Macro simple mediation model #4 analysis looking at pet ownership, empathy, and risk of recidivism in addition to hypothesis 1.1, 1.2, 2.1, and 2.2. See Figure 4 for a visual representation of the Hayes PROCESS Macro simple mediation model #4.

Results

The hypotheses of this study examined the interaction between pet ownership, pet attachment style, empathy, and risk of recidivism. Hypotheses 1.1 and 1.2 were supported by the data of this study. Previous research has shown that participation in a PAP can lead to a reduction in recidivism rates (Chianese, 2010; Fournier & Winston, 2019; Merriam, 2001). However, further research has yet to be done that investigates the influence of pet ownership after release and its influence on recidivism rates. The results of this study gave evidence that people with a legal history, who have a pet dog, had a lower risk of recidivism score than people with a legal history who did not have a pet dog. This study begins to bridge the gap between people who are currently incarcerated and people who are on either parole or probation in the community.

In addition, this study showed that there are differences in risk of recidivism scores depending on people's attachment styles with their pet. People with secure relationships can receive several positive benefits including a higher sense of life satisfaction, developing adaptive ways of dealing with stress, increased resilience through hardships, and a decreased chance of developing a psychological disorder (Cassidy & Shaver, 2002; Olufowote, Fife, Schleiden & Whiting, 2019; Sable, 2008). There is evidence to suggest that people can develop a secure attachment with their pet which may provide the same benefits (Kurdek, 2008; Zilcha-Mano, Mikulincer & Shaver, 2011). A one-way ANOVA was used to examine the participant's relationships with their pets and their risk of recidivism score. The results showed that the participant's SFS-98 (recidivism) scores were significantly different based on the type of attachment style they have with their pet dog. A Tukey post-hoc analysis further revealed the differences between the groups. Participants with a secure attachment style with their pet dog had a lower risk of recidivism compared to the participants with an anxious style. However, there was not a significant difference in risk of recidivism scores between the secure and avoidant or fearful attachment style groups. This indicates that people with a secure attachment style with their pet dog, compared to people with an anxious relationship with their pet dog, have a lower chance of going back into the legal system once they are released.

There is a significant gap in the scientific literature discussing the effects of pet ownership attachment styles and recidivism rates. One recent dissertation found a significant relationship between formerly incarcerated adult's anxious attachment style and behavioral characteristics (disinhibition and antisocial) of psychopathology (Christian, Sellbom & Wilkinson, 2017). Individuals who display a higher level of disinhibition and antisocial behaviors have a greater association with recidivism. Another study found that adults who scored

high on the anxious attachment style also had significantly higher rates of callousness and unemotional traits which can lead to an increased chance of becoming incarcerated (Mack, Hackney & Pyle, 2011). It is possible that the anxious attachment style characteristic of having a positive perspective on others and negative viewpoint on themselves influences the risk of recidivism rate (Van Buren & Cooley, 2002). This could account for the failure of differences that the avoidant and fearful attachment style had. However, more research needs to be done to identify more variables that would explain this relationship. Psychologists working with clients who have been involved in the legal system should encourage qualities of secure attachment in pet relationships. A prior study found that 10% of adult pet owners they surveyed had an anxious pet attachment style (Taggart, 1996). While we do not know the specific reasons for the association between a higher risk of recidivism and an anxious attachment style, it is important for the mental health field to not ignore their client's pet relationships. If psychologists notice their clients are displaying traits of an anxious attachment with their pet dog, it may be worthwhile to help the client work towards a secure attachment style.

Hypotheses 2.1 and 2.2 sought to investigate if dog owners with a legal history have a higher level of empathy than those without a pet dog. In addition, this study examined if the participant's empathy score is affected by their pet attachment style. An independent samples t-test showed significant results which supported hypothesis 2.1. This indicates participants, with a pet dog, obtained higher scores on the Brief Interpersonal Reactivity Index (B-IRI), an assessment that measures empathy, than participants who did not have a pet dog. These results align with current research showing that people who have pets are associated with a higher level of empathy towards others (Ascione, 1992; Podberscek, Paul & Serpell, 2005; Sprinkle, 2008). For hypothesis 2.2, a one-way ANOVA was used to further investigate if the participant's

attachment style had a relationship with the participant's score on the B-IRI. There were no significant differences in empathy scores among the attachment style groups. These results show that, while pet ownership is correlated with a higher empathy score, the participant's specific attachment style is not associated with empathy. These results provide more evidence in the scientific literature for counseling psychology that pet ownership can provide therapeutic benefits for clients. In addition, by examining the different attachment styles, psychologists will understand that pet ownership in general, not the type of attachment style, is the important factor for empathy. There are empathy programs offered throughout the United States of America for former inmates who are looking to stay out of prison (Community Justice Center, 2022; Marlow et al., 2012; Reinventing ReEntry, 2019). Psychologists working in programs such as these should consider adding an animal component to help the program members with empathy.

A Hayes PROCESS Macro (HPM) was used to further analyze the data and look for mediation using a conditional process model. Model 4 for simple meditation was employed while utilizing a bootstrapping approach to examine if any indirect effects were significant. Empathy, as measured by the B-IRI, was the mediator variable. Pet ownership served as the predictor variable, and risk of recidivism, as measured by the SFS-98, was the outcome variable. The first step looked at if pet ownership predicted a lower risk of recidivism. This step yielded significant results. This shows there was a relationship between the participant's ownership of a pet and their score on the SFS-98 for recidivism, within this model. These results inform the field of counseling psychology by providing evidence that pet dog ownership can have a significant role with reducing recidivism rates. The results of the second step indicated that pet owners have a higher rate of empathy versus non pet owners. The last step showed people, who have a higher empathy score, will have a statistically significantly lower risk of recidivism. Overall, the model

showed that pet ownership predicts a lower risk of recidivism and empathy plays a mediating variable role between pet ownership and risk of recidivism. There is a small effect that pet ownership has on recidivism that is partially mediated by empathy. These results support each hypothesis and provides a model for the predictive nature of pet ownership and empathy on the risk of recidivism.

In recent years, the incarcerated rate within the United States of America has reduced to its lowest level since 1995 (Minton, Beatty & Zeng, 2021). However, with still over two million people held in correctional facilities this is still a matter of grave importance for psychologists (Hamilton, 2021). In 2019, about 4.5 million individuals were living in the community on either probation or parole (Minton, Beatty & Zeng, 2021). Researching and understanding the different ways in which psychologists can help their clients reduce their risk of recidivism is essential. Mental health professionals working with former inmates can inquire if they have a pet or companion animal. If the client has a treatment goal involving staying out of the prison system, exploring their relationship with their pet may be helpful. The exploration should focus on their attachment style with their pet, and if they have an anxious one then possibly working on helping them work towards a secure attachment style. In addition, psychologists working with former inmates can potentially bring up pet dog ownership to help their clients break the incarceration cycle. This would be an option for clients who are able care for another living-being and with the financial resources to provide adequate care. Lastly, mental health professionals working in reentry programs or organizations serving the parole or probation populations can advocate to add dogs to the program. Many programs already have a focus on increasing participant's empathy and the results of the current study indicates that pet dog ownership is associated with higher empathy levels and can predict a low risk of recidivism. Providing outreach and educating

the public and organization leaders can help encourage people to take an evidence-based approach when developing reentry programs.

Future Research Directions and Counseling Implications

More research is needed in the area of breaking the incarceration cycle. Even though incarceration rates have fallen in the past few years the United States of America still has the highest rate of incarceration, per capita, in the world (Jacobson, Heard & Fair, 2017; Sentencing Project, 2021). This study was conducted to add to the available literature on variables that predict a lower risk of recidivism. Results of this study showed that participants with a secure pet attachment had a significantly lower risk of recidivism than participants with an anxious attachment style. A review of the available scientific literature revealed there is a dearth of research examining pet attachment styles in regard to recidivism. In addition, there does not appear to be literature exploring pet attachment styles and how that relates to recidivism. More research is needed in this area to further examine the role that pet attachment styles plays in relation to breaking the incarceration cycle.

In addition to empathy, another variable of interest researchers may want to examine would be emotion regulation. Emotion regulation has already been deemed a variable of interest for empathy levels (Stern & Cassidy, 2018). There does appear to be a connection between emotion regulation and empathy (Lockwood, Seara-Cardoso & Viding, 2014; Schipper & Petermann, 2013; Thompson, Uusberg, Gross & Chakrabarti, 2019). Researchers have also found significant differences between people's attachment style and their ability to regulate their emotions (Cooper, Shaver & Collins, 1998; Oshri, Sutton, Clay-Warner & Miller, 2015; Nielsen, 2017). One research study had a sample of 2,405 young adult offenders and examined the role of emotion regulation on incarceration rates (Grieger, Hosser & Schmidt, 2012). The authors

showed that emotion regulation predicted a lower rate of incarceration with all types of crime except property charges. Since empathy had a predictive quality, emotion regulation would be another variable that would benefit from more research. Future research should examine if emotion regulation is another possible meditating variable between pet attachment style and risk of recidivism.

Another area that would be of interest to evaluate, would be using the HPM to obtain a model that examines the effect that pet ownership has on empathy and recidivism with juvenile participants. There are already prison animal programs that have shown evidence to reduce recidivism rates with youth offenders (Chianese, 2010; Merriam, 2001). There is also evidence that having a relationship with a dog can increase juvenile's empathy scores (Ascione, 1992; Sprinkle, 2008). The current study showed that empathy can act as a partial mediating variable between pet ownership and recidivism in adult offenders, but there does not appear to be research looking at this relationship with the juvenile population. Since the relationship is present with adult offenders this could also be present in their juvenile counterparts. While youth incarceration rates have been rapidly declining, this would be an important matter for psychology researchers to evaluate considering there are 34,000 juveniles held in correctional facilities or residential programs throughout the United States of America (Wagner & Rabuy, 2017).

The current study utilized a cross-sectional research design to examine the meditation effect that empathy had on risk of recidivism. The results showed that empathy was a partial mediator between pet ownership and risk of recidivism. However, a model with a more rigorous research design could be used to further examine the effects. A longitudinal cohort study would track participant's scores over time which could give further evidence for the meditating effect that empathy has within this model. While some researchers assert that cross-sectional designs

are not automatically inferior to cohort research, it still would be beneficial to evaluate the variables over time using a mediating model (Shahar & Shahar, 2013). In addition, following research participants over time would provide more data points for a closer, and potentially, more reliable examination. Researchers who choose to take a longitudinal approach would also be able to examine the variable of recidivism more closely. Instead of using a risk of recidivism assessment, researchers could track the number of times the participants have been charged with a crime. This would add validity to the study along with a more reliable way to track recidivism.

The present study showed that there are psychological differences associated between pet attachment styles. There is limited research studying the effects that pet attachment styles can have on peoples' lives. Arguably the most common pet attachment questionnaire is the Lexington Attachment to Pets Scale, but this survey only measures the strength of the attachment (Wanser et al., 2019). The survey does not assist the research with sorting the participants into the different attachment style groups (Wanser et al., 2019). The scientific literature regarding the strength of people's relationship with their animals is expanding, but the categories of pet attachment is far less examined. This study's results indicated there are significant differences between pet attachment categories, and further research is warranted to inspect the implications of these differences. Research examining the four different attachment styles within human relationships show different mental health implications depending on the attachment style. People with secure attachment styles tend to have higher levels of resilience and report a higher amount of life satisfaction compared to anxious attachment styles (Cassidy & Shaver, 2002; Olufowote, Fife, Schleiden & Whiting, 2019; Sable, 2008). One study showed that people with an avoidant attachment style have more anxiety and depression symptoms compared to securely attached adults (Priel & Shamai, 1995). In addition, Shi (2003) found that, individuals who have

an anxious attachment style, tend to focus on fixing their partner's needs before their own and developed maladaptive conflict resolution behaviors. It is possible that differences in pet attachment styles may also be correlated with similar mental health symptoms and behaviors. One of the ways that mental health professionals can evaluate their client's relationship with their pet dog could be by using the Pet Attachment Questionnaire (PAQ). The current study provided strong evidence of the internal consistency of the overall assessment and both the anxiety and avoidant dimensions. Psychologists can use the PAQ to track and assess the type of attachment style their client has with their pet dog.

The current study's HPM revealed that pet ownership was a statistically significant predictor variable for the outcome variable risk of recidivism. The mediator variable, empathy, had a significant partially meditated effect on risk of recidivism. This aligns with current research discussing how pet ownership and empathy can have positive benefits on people trying to stay out of prison (Kratcoski & Kratcoski, 2017; Lawing, Childs, Frick & Vincent, 2017; Wooldredge & Smith, 2018). Taking care of a pet dog can have beneficial psychological effects that can help break the cycle of incarceration. This study provided more evidence that taking care of a dog, after being released from prison, can be valuable to individuals. Specifically, the results revealed that having a pet dog can be beneficial for empathy and recidivism.

Most of research available looks at the effects of PAPs, but not many researchers are discussing maintaining that positive pet and owner relationship upon prison release. The results of this study can be used to bolster the idea that involvement with a dog can contribute to lower recidivism rates. This is important because recidivism rates in the United States of America are some of the highest in the world (Jacobson, Heard & Fair, 2017). One study that followed 404,630 former inmates found that within the first three years 67.8% were re-arrested and within

the first five years 76.6% were re-arrested (Durose, Cooper & Syndyer, 2014). When people are released from prison, resources are provided to them for mental health care, medical care, housing, food assistance, and substance-use treatment programs. When a person has their basic needs met, and they feel comfortable supporting another life, mental health providers could examine the client's relationship with their pet. The current study shows that the relationship with a dog helps improve the client's level of empathy and thus help break the cycle of incarceration. Mental health providers should support clients if they feel ready to take on the responsibility of dog ownership. They should also be attuned to a client's relationship with their pet dog and take appropriate steps if they believe the client has an anxious relationship style and encourage a secure relationship in order to lower the risk of recidivism.

Study Limitations

A limitation of the current study is the self-reported nature of the data retrieved. Due to the sensitive nature of studying individuals who are incarcerated and the COVID-19 pandemic, it was determined that an online survey would be the best way of gathering data for this study. One of the main concerns of online self-reported data is honest responding to the questions asked. There were three validity check questions placed randomly within the order of questionnaires that assessed two areas. Firstly, the participants needed to answer two out of the three questions in order for their survey to be counted. This helps eliminate participants who were randomly responding to questions. Secondly, the questions were related to correctional facility information that a person would be more likely to know if they had any involvement with the legal system. One article discussing common American prison phrases was used to helped determine the three words used for the validity check (Dziedzic-Rawska, 2017). These three questions helped ensure

the participants were truthful about spending time in a correctional facility. However, the data still relied on participants being honest and open about their past and present life.

Due to funding, the COVID-19 pandemic, and time limitations, the current study utilized a cross-sectional research design where participants answered multiple questionnaires about their life experiences with no follow-up assessments. The cross-sectional approach that the present study used provided evidenced for an initial scientific approach. A longitudinal design, which follows participants, over a set period would provide a stronger foundation for the meditation analysis (Jose, 2016). Determining causality with a cross-sectional research design should be met with caution. While the results of current study were significant, the effect size was small. Therefore, even though empathy was shown to have a partially mediated effect within the current study's model, consideration should be used with interpreting the results. Future research which follows the participants over time would provide a more rigorous foundation for implications and assumptions.

An unforeseen limitation of the study was the abnormal distribution of data collected. The participant's scores for empathy were not normally distributed which means, at first, the data did not meet the statistical assumptions of typical statistical tests. The two standard deviation outlier removal method was used along with the logarithmic data transformation technique to address data skewness. After employing these two techniques the data were normative and could be used with parametric statistical tests.

Conclusion

Firstly, the present study found that people who have an incarceration history and a pet dog have a lower risk of recidivism than people with an incarceration history who do not have a pet dog. This parallels current research literature regarding this topic. Furthermore, people with a

secure attachment style with their dog had significantly lower risk of recidivism compared to an anxious attachment style. The results indicate different pet attachment styles impact people in significantly distinct ways. The present study also found that people who have a legal history and a pet dog have higher levels of empathy compared to people with a legal history who do not have a pet dog. A more detailed examination of pet attachment styles showed that different attachment styles did not have a significant impact on empathy scores. The HPM affirmed all the hypotheses results and revealed that pet ownership was a predictor of risk of recidivism with empathy as a mediating variable.

The results of this study provide more evidence to the available scientific literature that pet ownership can make a significant impact on former inmate's lives. In addition, the current study informs psychologists to be aware of client's relationship style with their pet dog and encourage them to build a more secure relationship if the relationship style appears anxious. The mental health field needs to continue working towards helping individuals break the cycle of incarceration while providing rehabilitative services. People in leadership roles in programs working with individuals on parole or probation should consider adding a pet ownership component. Psychologists should not ignore the valuable human animal bond that people have with their pets, and further research and clinical work needs to be done to examine the long-lasting effects that dogs have on people's mental well-being.

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Appendix A

Zilcha-Mano, Milulincer and Shaver's (2011) Pet Attachment Questionnarie

Pet Attachment Questionnaire (Zilcha-Mano, Mikulincer, & Shaver, 2011)

The following statements concern how you feel in the relationship with your pet. We are interested in how you experience the relationship with specific pet. If you have more than one pet, please select the one that you have the closest relationship with, and answer all the below questions about your relationship with this specific pet. Respond to each statement by indicating how much you agree or disagree with it, using the following rating scale:

1	2	3	4	5	6	7
Disagree Strongly	.....	.....	*Neutral/ Mixed*	.....	.....	*Agree Strongly*

1. Being close to my pet is pleasant for me	1	2	3	4	5	6	7
2. I'm often worried about what I'll do if something bad happens to my pet	1	2	3	4	5	6	7
3. I prefer not to be too close to my pet	1	2	3	4	5	6	7
4. Sometimes I feel that I force my pet to show more commitment and desire to be close to me	1	2	3	4	5	6	7
5. I prefer to keep some distance from my pet	1	2	3	4	5	6	7
6. If I can't get my pet to show interest in me, I get upset or angry	1	2	3	4	5	6	7
7. Often my pet is a nuisance to me	1	2	3	4	5	6	7
8. Signs of affection from my pet bolster my self-worth	1	2	3	4	5	6	7
9. I feel distant from my pet	1	2	3	4	5	6	7
10. I often feel that my pet doesn't allow me to get as close as I would like	1	2	3	4	5	6	7
11. I'm not very attached to my pet	1	2	3	4	5	6	7
12. I get angry when my pet doesn't want to be close to me as much as I would like it to	1	2	3	4	5	6	7
13. If necessary, I would be able to give away my pet without any difficulties	1	2	3	4	5	6	7
14. I get frustrated when my pet is not around as much as I would like it to be	1	2	3	4	5	6	7

15. I have no problem parting with my pet for a long duration	1	2	3	4	5	6	7
16. I need shows of affection from my pet to feel there is someone who accepts me as I am	1	2	3	4	5	6	7
17. I get uncomfortable when my pet wants to be close to me	1	2	3	4	5	6	7
18. I feel frustrated if my pet doesn't seem to be available for me when I need it	1	2	3	4	5	6	7
19. I get nervous when my pet gets too close to me	1	2	3	4	5	6	7
20. Without acts of affection from my pet I feel worthless	1	2	3	4	5	6	7
21. I want to get close to my pet, but I keep pulling away	1	2	3	4	5	6	7
22. I am worried about being left alone without my pet	1	2	3	4	5	6	7
23. I try to avoid getting too close to my pet	1	2	3	4	5	6	7
24. I need expressions of love from my pet to feel valuable	1	2	3	4	5	6	7
25. When I'm away from my pet for a long period of time, I hardly think about it	1	2	3	4	5	6	7
26. I need a lot of reassurance from my pet that it loves me	1	2	3	4	5	6	7

To code the PAQ, you should reverse score item no. 1.

An individual's score in the avoidant dimension is the sum of the odd numbered questions.
An individual's score in the anxiety dimension is the sum of the even numbered questions.

Appendix B

Ingoglia, Lo Coco & Albiero's (2016)

The Brief Interpersonal Reactivity Index

The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you by choosing the appropriate letter on the scale at the top of the page: A, B, C, D, or E. When you have decided on your answer, fill in the letter on the answer sheet next to the item number. READ EACH ITEM CAREFULLY BEFORE RESPONDING. Answer as honestly as you can. Thank you.

ANSWER SCALE:

A	B	C	D	E
DOES NOT DESCRIBE ME WELL				DESCRIBES ME VERY WELL

1. I often have tender, concerned feelings for people less fortunate than me.

(EC-2)

2. I really get involved with the feelings of the characters in a novel. (F-5)

3. In emergency situations, I feel apprehensive and ill-at-ease. (PD-6)

4. I try to look at everybody's side of a disagreement before I make a decision.

(PT-8)

5. When I see someone being taken advantage of, I feel kind of protective

toward them. (EC-9)

6. I sometimes try to understand my friends better by imagining how things

look from their perspective. (PT-11)

7. After seeing a play or movie, I have felt as though I were one of the

characters. (F-16)

8. Being in a tense emotional situation scares me. (PD-17)

9. When I see someone being treated unfairly, I feel very much pity for them.

(EC-18, originally expressed as a reversed item)

10. I would describe myself as a pretty soft-hearted person. (EC-22)

11. When I watch a good movie, I can very easily put myself in the place of a leading character. (F-23)

12. I tend to lose control during emergencies. (PD-24)

13. When I'm upset at someone, I usually try to "put myself in his shoes" for a while. (PT-25)

14. When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me. (F-26)

15. When I see someone who badly needs help in an emergency, I go to pieces. (PD-27)

16. Before criticizing somebody, I try to imagine how I would feel if I were in their place. (PT-28)

NOTE:(-) denotes item to be scored in reverse fashion

PT = perspective-taking scale
FS = fantasy scale
EC = empathic concern scale
PD = personal distress scale

A = 0
B = 1
C = 2
D = 3
E = 4

Except for reversed-scored items, which are scored:

A = 4
B = 3
C = 2
D = 1
E = 0

Appendix C

Hoffman & Beck's (1974) Salient Factor Score

Salient Factor Score (SFS 98)

Item A. PRIOR CONVICTIONS/ADJUDICATIONS (ADULT/JUVENILE) ..... _____

None = 3; One = 2; Two or three = 1; Four or more = 0

Item B. PRIOR COMMITMENT(S) OF MORE THAN 30 DAYS (ADULT/JUVENILE) ..... _____

None = 2; One or two = 1; Three or more = 0

Item C. AGE AT CURRENT OFFENSE/PRIOR COMMITMENTS ..... _____

26 years or more	Three or fewer prior commitments	= 3
	Four prior commitments	= 2
	Five or more commitments	= 1
22-25 years	Three or fewer prior commitments	= 2
	Four prior commitments	= 1
	Five or more commitments	= 0
20-21 years	Three or fewer prior commitments	= 1
	Four prior commitments	= 0
19 years or less	Any number of prior commitments	= 0

Item D. RECENT COMMITMENT FREE PERIOD (THREE YEARS)..... _____

No prior commitment of more than 30 days (adult or juvenile) or released to the community from last such commitment at least 3 years prior to the commencement of the current offense = 1; Otherwise = 0

Item E. PROBATION/PAROLE/CONFINEMENT/ESCAPE STATUS VIOLATOR THIS TIME... _____

Neither on probation, parole, confinement, or escape status at the time of the current offense; nor committed as a probation, parole, confinement, or escape status violator this time = 1; Otherwise = 0

Item F. OLDER OFFENDERS..... _____

If the offender was 41 years of age or more at the commencement of the current offense (and the total score from Items A - F above is 9 or less) = 1; Otherwise = 0

TOTAL SCORE..... _____

Appendix D

Demographic Questionnaire

What gender do you identify as?

A. Male
B. Female
C. Transgender Male
D. Transgender Female
E. Non-conforming/non-binary
F. Other _____

What is your age?

A. 18-25 years old
B. 26-45 years old
C. 46+ years old

What is your ethnicity?

A. Caucasian
B. African-American
C. Latino or Hispanic
D. Asian
E. Native American
F. Native Hawaiian or Pacific Islander
G. Two or more
H. Other _____

What is your location?

A. Pacific West US
B. Central US
C. Southeast US
D. Midwest US
E. Northeast US
F. Outside of the US

Have you ever been charged with a crime?

A. Yes
B. No

What type of crime were you charged with, if you were?

A. Nonviolent offense (e.g. drug related, property crimes)
B. Violent offense (e.g. assault, endangerment)
C. Violent sexual offense (e.g. sexual assault)

Did you spend any time in a correctional facility (e.g. jail, prison)?

A. Yes (under 1 day)

B. Yes (over 1 day)
C. No

Have you ever participated in a prison animal program at a prison?

A. Yes
B. No

Do you have a pet dog?

A. Yes
B. No

Are you the main caregiver to the dog?

A. Yes
B. No

How long have you had your pet dog?

A. Under 7 months
B. Over 7 months

Figures

Figure 1. *Two-dimensional model of attachment theory (Cassidy & Shaver, 2002).*

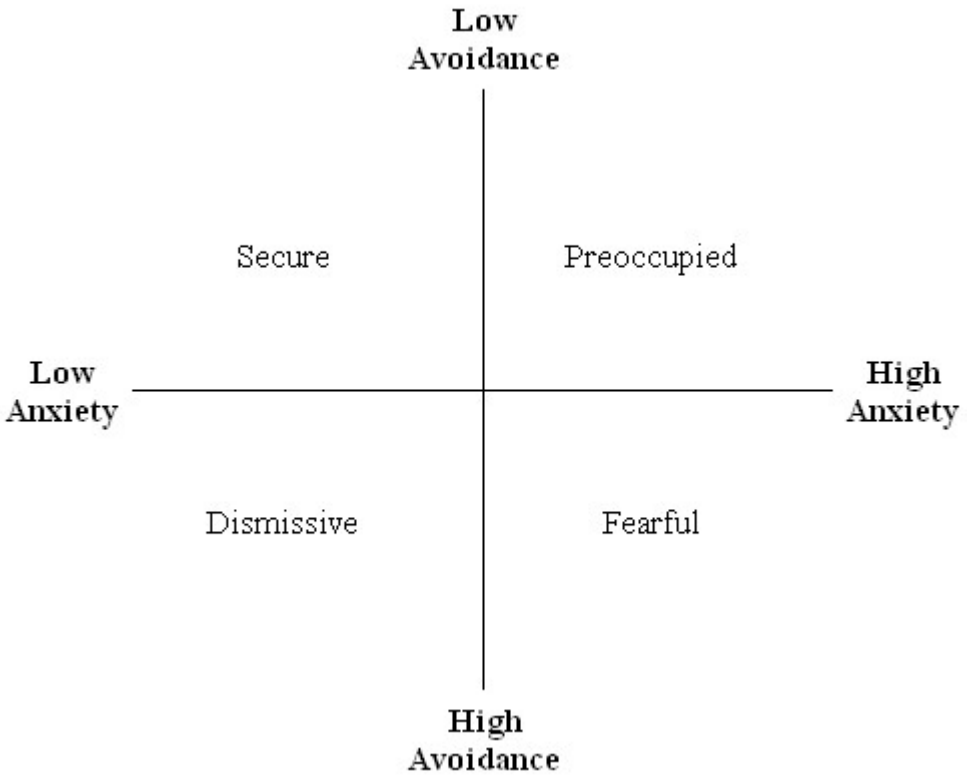

Figure 2. *Visual representation of mediating variable model.*

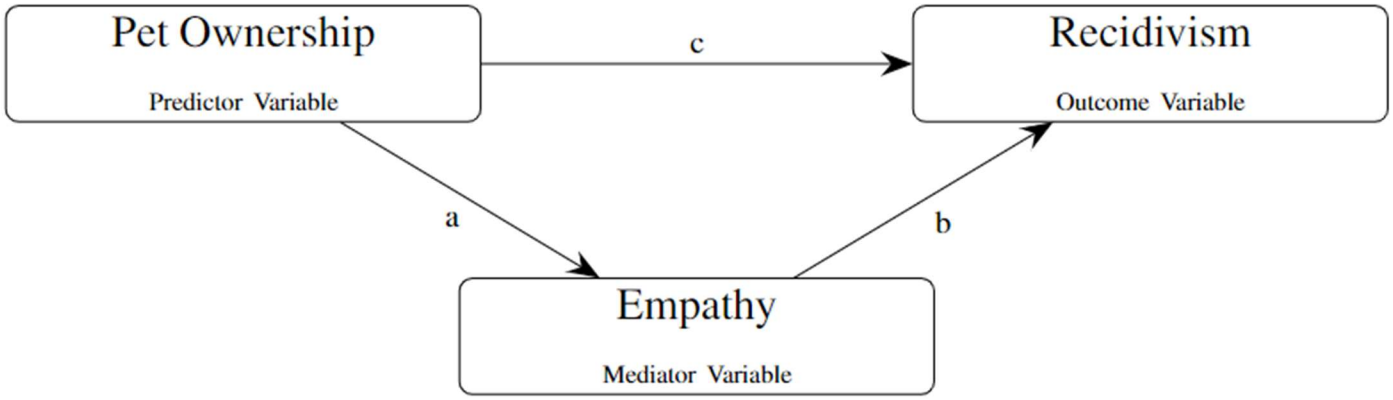

Figure 3. *Visual representation of mediating variable model after statistical analysis.*

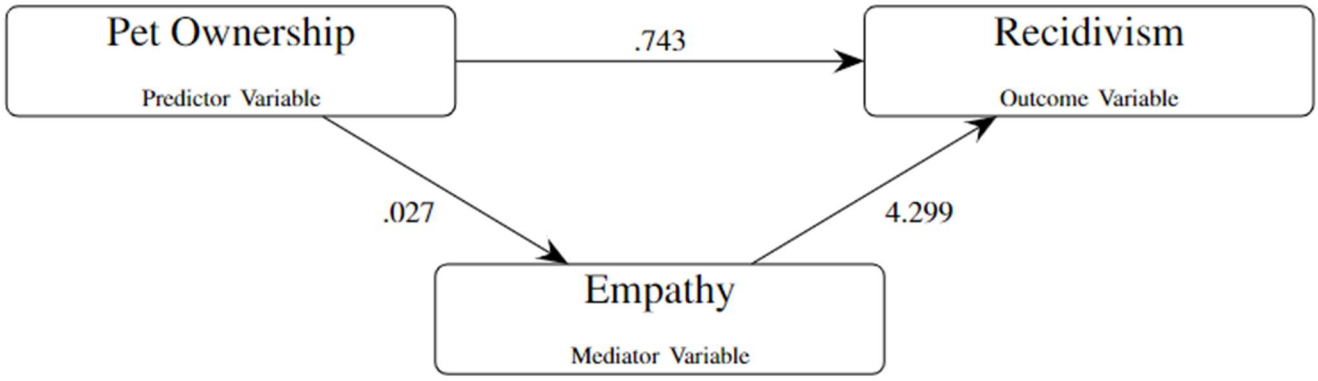

Figure 4. *Visual representation of the Hayes PROCESS Macro simple mediation model #4 (Stride, Gardner, Catley & Thomas, 2015).*