The Role of Pets in Buffering Loneliness in the Context of the COVID-19 Pandemic

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Senna Perelman

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A Senior Comprehensive Project Proposal

Senna Perelman

Allegheny College

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This work is mine unless otherwise cited.

Pledge: _____

Approved:

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Dr. Lydia Eckstein

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Table of Contents

Introduction

On March 11th, 2020 The World Health Organization officially declared COVID-19 a global pandemic, and by May 20th, just two months later 4,806,299 people had already been infected leaving 318,599 dead (Ciotti et al., 2020). As it is a respiratory virus, COVID-19 is most rapidly and effectively transmitted through the respiratory route mainly through droplet transmission (Ciotti et al., 2020). The World Health Organization identifies droplet transmission as most likely to occur when an individual is in close contact with someone exhibiting respiratory symptoms such as coughing or sneezing as their eyes, nose, and mouth are vulnerable to potentially infectious respiratory droplets (*Modes of Transmission of Virus Causing COVID-19*, n.d.). Due to the nature of transmission, protocols put in place to limit and stop the spread of COVID-19 included mask mandates, social distancing, lockdowns, and quarantines. By March 15th, just 4 days after COVID-19 was declared a pandemic, states within the U.S. began putting shutdowns in place. New York shut down their entire public school system, and Ohio closed restaurants and bars (CDC, 2022). By the end of March 2020, over 100 countries had entered lockdown completely halting what was considered normal life (Dunford et al., 2020). Colombia implemented a system of using citizens' I.D numbers to determine which days they were allowed to leave the house while an hour specifically designated for dog-walking was put in place in Serbia (Dunford et al., 2020). Tasks considered part of the daily routine such as school, work, and visiting with friends and family became restricted and potentially deadly. The threat of infection from social interactions mixed with the constant stream of new knowledge of deaths, infection rates, and protocols, led to many left facing the physical and mental effects of the newly announced pandemic.

While the effects of the pandemic on physical health were clear, concern soon turned to its effect on mental health. These unprecedented times of lockdowns, isolation, quarantines, social isolation, as well as other stressors quickly led to a rise in mental anguish (Ustun, 2021). Not long after the pandemic began, studies began finding an increase in mental health issues. A study conducted by Qui et al. (2020) collected 52,730 questionnaires from China's general population and found that 35% of respondents experienced psychological problems while a study conducted by Wang et al. (2020) found that 53.8% of respondents identified the psychological effect of the pandemic to be moderate or severe. Two other studies yielded similar results with Gao et al. (2020) finding 48.3% of respondents showed depressive symptoms and the data from Liu et al. (2020) showing 53.5% of respondents experiencing the same thing. While psychological problems can be found in every part of history, research showed that they were significantly worse during the pandemic than before. A survey that included 1441 respondents from during the COVID-19 pandemic and 5065 respondents from before the pandemic, found that the prevalence of depressive symptoms was more than three times higher during the pandemic than before (Ettman et al., 2020).

The pandemic's impact on mental health led to a wide range of coping strategies. One of the most discussed strategies determined by a study conducted between October and November of 2020 was thinking positively and included engagement with hobbies including but not limited to, DIY activities, various forms of exercise including walking, and spending time in nature (Wright et al., 2021). Additionally, some of the more maladaptive coping mechanisms found by the study included alcohol consumption and binge eating (Wright et al., 2021). The mental anguish caused by the pandemic called for a myriad of coping strategies, and one of the most

popular, and possibly effective may actually have been adopting a pet or the utilization of those already in the home.

Pre-pandemic there was certainly no shortage of pets. In the United States alone over two-thirds of homes include a pet (Janssens et al., 2020) accounting for the fact that in the U.S. children are more likely to live with a pet than live with their biological father or a sibling (Hodgson et al., 2015). However, while the devastating number of deaths and infections continued to increase, so did the, seemingly unrelated, interest in pet adoption. One study used Google Trends to investigate this phenomenon and found an increase in relative search volume (RSV) for related terms (Ho et al., 2021). The RSV for pets, dogs, and adoption worldwide peaked between April and May 2020, very recently after the pandemic was declared (Ho et al., 2021). When comparing this to the same months of 2019, RSV for both cat and dog adoption increased by more than 250% (Ho et al., 2021). The American Society for the Prevention of Cruelty to Animals or ASPCA conducted a national poll of 5,020 respondents that showed that approximately 23 million or one in five American households adopted a cat or a dog since the pandemic began (*New ASPCA Survey Shows Overwhelming Majority of Dogs and Cats Acquired During the Pandemic Are Still in Their Homes*, n.d.). In addition to an increase in adoption, studies also found a decrease in the relinquishment or surrendering of cats and dogs during the start of the pandemic compared with the same time frame in 2019 (Powell et al., 2021). A study that polled 14 different animal shelters found a 20% decrease in cat relinquishment and 24% in dog relinquishment in 2020 compared to 2019 (Powell et al., 2021). These studies show not only that interest in adopting and the number of pets adopted increased but also that more pets were staying in these homes compared to the year before, indicating more pets in households during the pandemic. This phenomenon can possibly be explained by the fact that pets are associated

with benefiting the mental and physical health of their owners (Powell et al., 2021). However, it is important to examine if and how pets are able to buffer the devastating mental and physical effects brought on by the COVID-19 pandemic.

Chapter 1: COVID-19's Impact on Mental and Physical Health

COVID's Impact on Daily Life

The start of the COVID pandemic saw immediate and devastating physical health effects with 4,806,299 confirmed cases just two months after the declaration of the pandemic, leaving 318,599 dead (Ciotti et al., 2020). To combat the rapidly growing infection rate and deaths, governments all over the world put in place numerous measures. Due to the fact that by now it had been determined that COVID was most rapidly and effectively transmitted through droplet transmission occurring in close contact (Ciotti et al., 2020), the bulk of these measures aimed to decrease individuals' contact with each other (Landmann & Rohmann, 2021). This led to a huge halting of and impact on what was considered normal parts of daily life including but not limited to school, work, travel, sports, and social gatherings (Ivanova & Crave, 2020).

One of the major effects seen was COVID's impact on schools. As early as February 25th, 2020, before COVID was officially declared a pandemic, an official at the Center for Disease Control and Prevention made a call to schools and families in a press conference urging parents and guardians to start inquiring about and preparing for school shutdowns and tele-school (Baker & Staff, 2022). Just two days later Bothell High School in Washington state became the first school to close due to the Coronavirus, though it was only for two days (Baker & Staff, 2022). By the end of that March, Education Week had recorded the first COVID-related death of a teacher, Congress had passed one of three federal financial aid packages that aimed at providing money to schools to cover emergency costs of stopping the spread of COVID as well as supporting students (Baker & Staff, 2022), and schools continued to face shutdowns. On March 12th, Ohio became the first state to announce a statewide closing, and not long after Kansas became the first state to close schools for the remainder of the academic year (Baker &

Staff, 2022). By April 17th, more than half of U.S. public schools closed for the remainder of the year with the rest of the states following suit by May 6th ("The Coronavirus Spring," 2020). The closing of schools had a drastic and widespread impact. A systematic review of 36 studies across 11 countries found that the closing of schools due to the pandemic had numerous negative effects on students such as increased anxiety and distress as well as decreased physical activity and increased screen time (Viner et al., 2022). David Schonfeld, a leading national expert on school crisis management highlighted the impact on students as they were not just dealing with the disease itself but were also forced to face what the closing of schools meant, such as a loss of stability and safety for some, as well as once in a lifetime moments such as prom and graduation ("The Coronavirus Spring," 2020). Those not in school still faced similar impacts in the form of remote work and the halt in routine life. The U.S. Census Bureau released that between 2019 and 2021 the number of people working from home tripled with 5.7% working from home in 2019 and 17.9% in 2021 (Doherty, 2022). Nearly 48.3% of workers in Washington D.C reported working from home with the state of Washington, Maryland, and Colorado following with 24% (Doherty, 2022). The extent of this impact can be seen in the data that showed that in 2021, the average commuting time for a private vehicle was two minutes shorter than the average commuting time in 2019 as there were significantly fewer people traveling to work (Doherty, 2022). Similarly to school closings, remote work is reported to impact mental health. The American Psychology Association conducted a survey between March 26th and April 5th, 2021, and found that the majority of those working from home reported experiencing adverse mental health effects such as feeling isolation, loneliness, and a hard time feeling that they could distance themselves from work at the end of the day (Robinson, 2021). The data found that

almost two-thirds of those working from home reported feeling lonely and isolated at least part of the time while 17% reported those feelings all the time (Robinson, 2021).

In addition to school and work, many other normalities were halted by COVID, one being travel. On March 13th, 2020 the U.S. issued a travel ban barring non-U.S citizens traveling from 26 European countries, and on March 28th a domestic travel advisory for New York, New Jersey, and Connecticut was put in place urging against non-essential domestic travel (CDC, 2022). Early in February 2020, airlines began suspending and limiting flights to mainland China and countries including the U.S., Russia, Italy, and Australia implemented travel restrictions (Chinazzi et al., 2020). As the pandemic raged on, over 130 countries implemented some form of travel restriction including quarantine, screening, and a complete ban on travel to certain areas (Devi, 2020). On top of, what some may consider severe, impacts of COVID on daily life such as travel, school, and work, smaller aspects of life were affected as well including but not limited to the closing and or suspension of restaurants, museums, libraries, movie theaters, gyms, professional and recreational sports (COVID impacted the NBA, PGA Golf, NHL, MLB, MLS, U.S Soccer, NCAA Basketball Tournament, XFL Football, Tennis: ATP and WTA tours, International Soccer, and Auto Racing), music festivals, concerts, Broadway performances, and public events (Ivanova & Crave, 2020). These impacts mixed with ongoing social distancing that greatly limited social interaction and increased isolation played a huge role in the mental anguish felt during COVID as it removed social contact as well as outlets and joys that hobbies provide.

Impact and Causes of Loneliness and Social Pain

One of the biggest ways COVID impacted individuals was through the increase in loneliness. Biologically, human beings are programmed to reproduce, and being socially accepted is vital for this to occur. To be socially accepted means that other people want you in

their groups and relationships, while social rejection means others have little to no interest in including you in groups and relationships, and people experience both of these in numerous ways (DeWall & Bushman, 2011). The need to belong, defined as wanting to maintain close and lasting relationships with others and can be defined in two parts, the first being that people want positive and regular social contact and the second part that people want stable relationships where mutual concern is present (Baumeister & Leary, 1995). The need to belong is a universal feeling and experience fueled by biological needs. By nature of our reproductive and survival needs, humans are not well equipped for life in isolation. This is seen through early humans' dependency on groups to meet survival needs through protection, opportunities to reproduce, and sharing and receiving resources that lightened the burden of survival (DeWall & Bushman, 2011). Because of the implications for survival, as exclusion from early group living was quite literally a death sentence, social rejection is experienced as bitter as a means to motivate individuals to avoid these experiences and increase survival (DeWall & Bushman, 2011).

Because social acceptance serves as a human need, social rejection can have numerous effects ranging from emotional, cognitive, behavioral, and neural (DeWall & Bushman, 2011). In regards to emotional changes, social rejection can lead to a myriad of negative emotions such as hurt feelings, an increase in anxiety, anger, sadness, depression, jealousy (Leary, 2010), as well as diminished self-esteem (Williams et al., 2000). Social rejection can impact cognitive processes in a few ways such as a negative impact on individuals' performance on challenging intellectual tasks as well as hypervigilance towards potential social acceptance and threats of rejection. For example, when presented with ambiguous actions from a stranger, those already experiencing rejection perceive hostility (DeWall, Twenge, Gitter, & Baumeister, 2009). When it comes to behavioral changes, social rejection can have effects counterproductive to gaining acceptance

such as increased aggression. Within respective studies, rejected people in comparison to those not experiencing rejection subjected strangers to longer bouts of intense white noise, subjected those who do not like spicy food to greater amounts of hot sauce, and gave potentially damaging evaluations to those applying to jobs (Twenge, Baumeister, Tice, & Stucke, 2001). Within the real world, the behavioral effects of social rejections are seen through the implications of acts of mass violence. When analyzing cases of school shooters, social rejection was found in thirteen out of the fifteen cases (Leary, Kowalski, Smith, & Phillips, 2003). Additionally, the extent of the impact of social acceptance can be seen through the fact that even a small experience of acceptance even from a stranger has been found to reduce aggression in rejected individuals (DeWall, Twenge, Bushman, Im, & Williams, 2010). Social rejection can also cause numerous biological responses. When an individual experiences social rejection their heart quite literally slows down (Gunther Moor, Crone, & van der Molen, 2010), they experience an increase in progesterone the hormone heavily associated with motivation for social affiliation (Maner, Miller, Schmidt, & Eckel, 2010), and the release of the stress hormone cortisol is increased due to the stress of negative social evaluation caused by rejection (Dickerson & Kemeny, 2004). Additionally, social rejection has neural effects, changing the way an individual's brain is working such as increased activation in the dorsal anterior cingulate cortex, and anterior insula, all regions of the brain associated with the affective aspect of physical pain (Eisenberger, Lieberman, & Williams, 2003). Social acceptance is so important to human life that studies by Stillman et al. (2009) found that when surveying individuals experiencing social rejection and those not, those experiencing rejection quite literally experienced life as less meaningful than their non-rejected counterparts. Additionally, research conducted by DeWall (2011) has even found a connection between loneliness and smoking as smoking may be seen as an avenue to

acceptance. Multiple studies found that participants who experienced more childhood rejection began smoking at an earlier age, loneliness leads to increased tobacco use, a positive association with having ever smoked in general, an increase in the chances of smoking once per week over the course of two months, and a positive association with chain-smoking (DeWall & Pond, 2011). Because of the implications of social acceptance and rejection, humans are social creatures by nature, spending almost 80% of time awake with others and valuing this as more rewarding than time spent alone (Hawkley & Cacioppo, 2010).

Due to the vitality of social interactions, it's no surprise that loneliness can have detrimental effects. Loneliness is defined by Hawkley and Cacioppo as a feeling of distress caused by the perceived dissonance between an individual's ideal experience of social interactions and relationships and their actual experience. Every single person is susceptible to loneliness (Hawkley & Cacioppo, 2010). Loneliness can have numerous harmful effects, including impacting physical health. Studies have found that loneliness can predict an increase in morbidity and mortality. For example, loneliness is associated with cardiovascular health risks among young adults where the more times an individual experiences loneliness, the more cardiovascular health risks they faced (Caspi et al., 2006) and the same has been found for systolic blood pressure (Hawkley et al., 2006). Loneliness can have an effect on immune functioning as a whole. Studies have found a link between loneliness and lower natural killer (Nk) cell activity and higher antibody titers to the Epstein Barr and human herpes viruses (Kiecolt-Glaser et al., 1984), and poorer antibody response to a part of the flu vaccine (Pressman et al., 2005). With these facts combined with the fact loneliness affects sleep, an imperative part of physical health, it is no surprise that loneliness has been shown to predict all-cause mortality even when controlling for other factors such as age, sex, chronic disease, alcohol use, smoking,

self-rated health, and functional limitations (Penninx et al., 1997). In addition to physical health, loneliness can impact mental health and cognitive functioning as well. Associations have been found between loneliness and personality disorders, psychoses (DeNiro, 1995), suicide (Goldsmith et al., 2002), increased depressive symptoms (Cacioppo et al., 2006), increased perceived stress, fear of negative evaluation, anxiety, anger, and decreased optimism and self-esteem (Cacioppo et al., 2006). Loneliness can also lead to impairment in cognitive functioning and performance even increasing the risk of Alzheimer's and dementia. One study found that after adjusting for factors such as age, sex, and education, individuals who experienced more loneliness were 2.1 times more likely to develop Alzheimer's than those registering less loneliness (Wilson et al., 2007). Experiencing loneliness can affect quality of life in more ways than just mental and physical health. Cacioppo and Hawkley's research on loneliness posits that perceived social isolation can lead to feeling unsafe as well as hypervigilance for social threats in which this unconscious surveillance can cause cognitive biases (Hawkley & Cacioppo, 2010). Due to this, lonely individuals experience the world as a more negative and threatening place, remembering more negative social information and expecting more negative social interactions than their non-lonely counterparts. These negative expectations can lend themselves to a self-fulfilling prophecy by eliciting behaviors from others that serve as confirmation of the lonely individual's expectations of the world (Newall et al., 2009). Amongst other adverse side effects, this perceived experience of the world due to loneliness can lead to a decrease in the ability to self-regulate emotions and behavior. This can be problematic when it comes to the ability, or lack thereof, to regulate self-control behaviors. Studies have found that diminished regulation of emotion due to loneliness in middle-aged and older adults decreases the likelihood of engaging in physical activity, a proven way to maintain

and support physical and mental health as well as cognitive functioning (Hawkley et al., 2009). In addition to a decrease in physical activity, loneliness has been shown to be a risk factor for obesity as well as other health-compromising behaviors such as greater chances of engaging in alcohol abuse (Akerlind & Hörnquist, 1992). As if the risk for health-compromising behaviors was not detrimental enough, loneliness research on animals has shown that health behaviors may be more beneficial and effective for those who feel socially connected than those who feel lonely (Stranahan et al., 2006).

In addition to the numerous effects that stem from loneliness, loneliness itself can be undeniably painful. Social pain, defined by Eisenberger as unpleasant and related to actual or perceived potential danger to an individual's sense of social connection and value (Eisenberger, 2012), may be closely related to physical pain in more ways than one. One of the most obvious connections between the two can be seen in the ways language is used to describe both physical and social pain. Language of physical pain is mirrored in descriptions of social pain such as hurt feelings the same way one would express a hurt finger, and having a broken heart the same way one may describe a broken bone (Eisenberger, 2012). This overlap in the use of words to describe both physical and social pain, which can be seen across numerous languages, suggest a connection between the two sensations. In one study, individuals using a pain rating scale rated previous experiences of social pain as just as painful as experiences of physical pain (Eisenberger, 2012). These results are not unlike those found in research conducted by McDonald and Leary (2005) that found numerous overlapping variables between both physical and social pain in emotional expression, neurological mechanisms and more. This overlap between social and physical pain is not a coincidence as research has shown that physical and social pain share neurological similarities being processed by some of the same neural circuitry

(Eisenberger, 2012). For example, a study by Kross et al. (2011) found neural connection in the fact that the brain systems for social rejection developed by co-opting the circuits that make the affective aspect of physical pain possible, resulting in similar representations. One study on non-human mammals even found that opiates used to relieve physical pain were also able to reduce separation distress behaviors showing beneficial effects for both pains caused physically and socially, and other studies have found that a reduction of physical pain occurs in the presence of social support and increased feeling of social disconnect when experiencing physical pain (Eisenberger, 2012). The research supports a clear connection between physical and social pain, showing how feelings of loneliness and social disconnect, something found to be incredibly common during COVID, can be as painful as actual physical pain.

Loneliness During COVID-19

Even before the pandemic began, social isolation and loneliness were garnering attention as major public health concerns due to the long list of possible detrimental effects. While mental health has historically always been stigmatized, the addition of digital platforms and social media to daily life has allowed for much more discussion and awareness on the topic (Williamson, 2020). Additionally, professional athletes from all areas of the sports world have served as advocates for the importance of mental health, with many such as Dwayne “The Rock” Johnson, Lindsey Vonn, Michale Phelps, Kevin Love, Serena Williams, Naomi Osaka, Demar Derozan, Paul Pierce, Ronda Rousey, and Dak Prescott sharing their own experiences (The Editors, 2021). This increase in prioritization of mental health can also be seen through the increase in interest and funds given by the public sector. For example, the Australian government’s budget for mental health services more than doubled from nearly 1 billion AUD in 2007-2008 to 2.1 billion AUD in 2019-2020 (Williamson, 2020). Additionally, increases in available mental health

services such as online options, as well as a shift in psychiatry from a hospital setting to a more community-based one have led to increased prioritization of mental health (Williamson, 2020). While there was already a clear trend towards better prioritization of and consideration of mental health, the COVID-19 pandemic only exacerbated this (Ernst et al., 2022). The measures implemented during the COVID-19 pandemic aimed at decreasing the spread through limited interaction between individuals led to a huge impact on what daily life looked like (Landmann & Rohmann, 2021). Almost every form of social interaction was impacted in some way, serving as one of the main reasons that during COVID loneliness became its own pandemic (Landmann & Rohmann, 2021). Since the start of the pandemic, numerous studies of the general population have found an increase in loneliness (Dahlberg, 2021). Social isolation can be defined as having a small network of close and not close relationships that then leads to fewer and infrequent social interactions (Ernst et al., 2022). While socially isolated people are not necessarily always lonely people, social isolation has been found to be a huge risk factor for loneliness (Ernst et al., 2022). Due to the nature of government's responses to the disease across the globe through lockdowns, quarantines, social and physical distancing measures, and restrictions on daily activities, social isolation was not in short supply. Buecker and Horstmann conducted some of the first research on COVID-19's impact on the prevalence of social isolation and loneliness. The research was conducted using 4,832 German residents who completed a baseline survey, repeated the process of four days of daily surveys followed by a three-day break, and then a weekly review survey. The researchers examined the differing sociodemographic characteristics within the participants, specifically age, gender, employment status, relationship status, household type in terms of living situation (alone vs. with others), and pre-existing health conditions concerning COVID-19 (Buecker & Horstmann, 2021). After examination, significant cross-level examinations between

days of lockdown and age, gender, family status, and occupational status were found. There was a positive cross-level interaction between days and age which indicated that as age increases the quantity of social relationships as compared to before the pandemic decreased less strongly over time. The cross-level interaction between days and gender showed the quantity decreased more intensely for men than women, and that there was no significant difference between women and individuals who identify as non-binary. In terms of relationship status, the research found a stronger reduction in single people than those in romantic relationships, and the relationship between days and occupation status showed that those in training had a stronger reduction in the quantity of relationships than those working full-time (Buecker & Horstmann, 2021). This is not the only research that indicates certain groups experienced loneliness during COVID differently. Research conducted in the United Kingdom found that young adults aged 18-30, those living alone, people with a lower household income, unemployed individuals, and people dealing with a mental health condition had a higher chance of experiencing loneliness during the pandemic, additionally finding that since the start of the pandemic, being a student served as a higher risk for loneliness than it did before (*How Has Covid-19 Affected Loneliness?*, n.d.). Not only was there widespread loneliness caused by COVID, but research has also found that those who were already lonely became even lonelier, furthering the gap between lonely and not lonely individuals (Patulny & Bower, 2022). One study examined multi-wave qualitative data collected in Australia in 2020 to examine loneliness while transitioning out of the lockdown. Overall, participants reported increased feelings of loneliness due to factors such as physical isolation, health related anxieties, the cancelation and stopping of activities, decreased connection quality, and lack of motivation (Patulny & Bower, 2022). It was also found that the way in which interactions had to alter to remain COVID-safe proved more challenging and harmful to certain

groups of people. These groups include single people, those with social anxiety, people with physical and mental disabilities and their carers, and those who had already entered the pandemic with low social capital (Patulny & Bower, 2022). While COVID was and is dangerous for everyone, there are groups who are at more risk for more serious presentations of symptoms and even death such as older adults, people with medical conditions, and immunocompromised individuals (CDC, 2020). In addition to the groups found in other research, these groups of people may have experienced greater loneliness as individual factors led to stricter and longer isolation, even when others began returning to what was considered normal.

As made clear by the ample research on social rejection and pain, loneliness is a complex concept. Previous research conducted by Buecker et al. (2020) explored the idea of loneliness having two dimensions, emotional and social. Within the research, emotional loneliness is experienced as lacking emotional connections with others, while social loneliness lends itself to a feeling of missing a broader social network (Buecker et al., 2020). However, the caveat to this idea of dual dimensions is the fact that neither emotional nor social loneliness completely encapsulates the feelings presented by restricted physical contact (Landmann & Rohmann, 2021). While every individual and their experience during COVID is different, based on an understanding of COVID restrictions, emotional loneliness may not be exceptionally prevalent for individuals as they are still able to feel connected to others. Additioanlly, due to the fact that, for the most part, social networks persisted on some level social loneliness was also not the main experience (Landmann & Rohmann, 2021). However, the restriction of physical touch and interactions takes away interpersonal touch, a foundation of human nature and communication (Hetherington, 2000). Physical touch has historically been used as a means of healing in numerous cultures (Goodman & Teicher, 1988), is an essential part of human development

(Stenzel & Rupert, 2004), acts as protective and reductive against stress (Landmann & Rohmann, 2021), and has the ability to increase feelings of gratitude (Simão & Seibt, 2015). In addition to one-on-one physical touch, the physical contact of being in a crowd has physical and psychological benefits as well (Hopkins & Reicher, 2017). Being part of a group has been shown to increase the feeling of a shared identity within that group, a shift from feelings of what makes a person an individual to what makes them part of the group (Hopkins & Reicher, 2017). Additionally, somewhat counterintuitive to the associated stressors of being in a large mass of people, research has found that when feelings of group identification are stronger, individuals feel less crowded even when in an objectively large crowd, acting as a stress reducer instead of a stressor (Hopkins & Reicher, 2017). Being part of a crowd also increases feelings of control (Greenaway et al., 2015), lowers stress (Haslam & Reicher, 2006), and increases the perceived availability of social support (Hopkins & Reicher, 2017). Concerts, sporting events (Field, 2010), religious gatherings such as the Hajj and the Prayag Magh Mela, as well as smaller gatherings have many benefits (Hopkins & Reicher, 2017). The benefits of social gatherings and physical touch were greatly diminished by COVID restrictions, adding to the already present feelings of loneliness.

One way people tried to get around the loneliness inducing aspects of COVID was through virtual connection such as Zoom and other video chat services used for a myriad of virtual gatherings, online watch parties, multiplayer games, social media, and so much more, options that were not available during pandemics of the past (Gabbiadini et al., 2020). Increased use of all digital platforms and social media was registered globally during the pandemic (Gabbiadini et al., 2020), and in one study by Gabbiadini et al. (2020) participants reported increased use of technologies during the pandemic such as streaming movies and tv shows in

party mode, a way for multiple people to watch at the same time, online board games, and multiplayer video games. While these virtual interactions can help reduce some loneliness and the associated feelings caused by the pandemic, there are drawbacks as well. Online communication has been found to decrease social cues imperative to face-to-face interactions, lead to more impersonal interactions (White & Dorman, 2001), increase the difficulty of sharing mutual support (Lewandowski et al., 2011), decrease empathy (Konrath et al., 2011), and increased individualism (Wellman et al., 2003). There are undeniable benefits of virtual connection, but a huge limitation is accessibility. These technologies are by no means available to everyone, and consequently, many groups who are not likely to have access are some of the groups with high infection rates such as older adults who even if they do have access to the technologies may not have the education on how to use them, sick people, and those living in poverty (Gabbiadini et al., 2020). The effect of COVID-19 on loneliness and the associated feelings is and was widespread and devastating. When facing such hardship many people looked for ways to cope, one of which included the utilization of pets.

Chapter 2: Pets' Impact on Mental and Physical Health

Who Owns Pets and Why

Before understanding why humans love their pets so much, it is important to define what a pet is. Thomas (1991) suggests a few criteria that make the relationships between humans and pets different than humans and other animals: pets are allowed in the home, they are given names, and they are not eaten. It is easily argued that attitudes and feelings towards animals and pets are social constructs that differ and change depending on context, such as culture, media, institutions, and other people (Arluke, 2010). For example, it is argued that as American society has become urbanized and the separation between farming and hunting has increased for the general population, a more romanticized view of animals has developed (Budiansky, 1992). Examining human-pet relationships as a social construct can help make clearer the changes throughout history and even the differences today. Part of these differences has to do with the fact that societies rank everything, including animals on their worth, and throughout time and context this ranking changes (Arluke et al., 1996).

In addition to societal factors, research has suggested that individual differences play a role in relationships with pets as well. One factor that has an influence on relationships with pets is gender, and while gender is not a binary, the present research has only looked into differences between men and women. In terms of treatment of and attitudes towards animals, women generally tend to have a more positive and empathetic view towards animals than men, and when it comes to owning pets women more often view themselves as a parent, while men view themselves as a partner or companion (Signal & Taylor, 2007). Additionally, data from the GSS, or General Social Survey, found that in the United States, 51% of women have a dog compared to 41% of men, but found no differences for cat owners (Applebaum et. al, 2020). While the data

on race and ethnicity and pet ownership is sparse, from the data that has been collected within the United States, White people are the most likely to own pets and Black people are the least likely. Cat ownership among White people was five times higher than for Black people with Latinx individuals falling in the middle (Herzog, n.d). The probability of owning a pet and the nature of the relationship is also influenced by the age of an individual and what stage of life they are in. For example, individuals in mid-life stages are more likely to have a pet than people who are under 30 or over 70 (Applebaum et. al, 2020). Lifestyle choices in terms of where a person lives and how much space they have have a significant impact on pet ownership. Somewhat intuitively, people who have more space are more likely to have pets. This is mirrored in the data that shows that compared to the five states with the highest rate of dog ownership, the five states with the lowest rates are fifteen times more crowded in human population density (Herzog, n.d). Additionally, the size of the town an individual lives in also has an impact on pet ownership with data from the GSS showing that of the people who live in cities, only 40% owned dogs and 20% owned cats compared to rural areas where 55% owned dogs and 37% owned cats. Part of the discrepancy may be the fact that people are more likely to own a pet when living in a house compared to a condo or apartment (Applebaum et. al, 2020). Due to the expenses necessary to own and care for a pet, money is a factor as well. Among European nations, individuals from rich countries like Sweden were more likely to own a dog than people living in poorer countries such as Greece (Herzog, n.d). Similarly, within the United States, individuals in the lowest 25th percentile of family income were less likely to own a dog compared to those in any other income group (Herzog, n.d). Another factor in the probability and nature of pet ownership is simply experiences with animals. Studies have found that people who were raised with pets as kids were more likely to own a pet as an adult, and it often was the same

type of pet from their childhood (Herzog, n.d). Additionally, associations between Big Five Personality factors and the type of pet a person owns have been found. Gosling et al. (2015) surveyed 4,565 participants who took the Big Five inventory and then self-identified as either a cat owner, a dog owner, owned both or owned neither. The results showed that dog owners were higher in Extraversion, Agreeableness, and Conscientiousness, but lower in Neuroticism and Openness than cat people. Lastly, and perhaps one of the most surprising factors with influence on pet ownership is genetics. A Swedish study on twins and pet ownership examined expansive sets of data on fraternal and identical twins and pet ownership, with the obvious and important distinction that identical twins share more genetic similarities than fraternal twins. Within males, identical twins had a 30% chance of owning a dog if their twin brother did compared to only 18% for fraternal twins. Similarly, female identical twins had a 40% chance of owning a dog if their twin sister did compared to 25% for fraternal twins, finding that overall within the study genetic factors were responsible for an estimated 51% of the differences in pet ownership in men and 57% in women (Fall et al., 2019). It is important to point out that there is no one gene solely responsible for pet ownership, and much like all other human traits it is polygenic, meaning there are thousands of genes impacting human relationships with pets (Fall et al., 2019).

Physiological Benefits of Pets

Studies have found copious evidence of the benefit of pets including psychological ones as well as physiological ones also known as zooeyia, derived from the greek root words zion meaning animal, and Hygeia meaning health derived from the goddess of health (Hodgson & Darling, 2011). In terms of physiological effects, Hodgson argues that pets can benefit physical health in four ways: through increasing social capital, aiding in harm reduction, motivating healthy behaviors, and they can serve as part of patients' treatment plans (Hodgson et. al, 2015).

To properly care for their pets such as walking a dog or venturing to the pet store for necessities, pet owners tend to be more civically engaged than people without pets (Wood et al., 2005). For example, more than half of dog owners become acquainted with their neighbors as a direct result of their pet, and over 80% report engaging in conversation with other pet owners while walking their dogs (Wood et al., 2005). Pets can serve as motivators for healthy behaviors as well as deterrents for risky ones. One study by Milberger found that smokers who owned pets were motivated to quit, attempt to quit, or encourage other members of the household to quit due to the potential harm of secondhand smoke to their pets (Milberger et al., 2009). Additionally, owning a dog can positively impact physical activity, a significant predictor of disease. Compared to non-dog owners, people with dogs complete about 300 minutes of moderate activity a week compared to the 170 minutes for non-dog owners (Kushner et al., 2006), and children who live with dogs are reported to take more daily steps and engage in more physical activity than children without pets (Owen et al., 2010). Additionally, exercise and physical activity programs often stress the importance of a buddy system. And while human exercise buddies can encourage physical activity they also can discourage it. Pets on the other hand serve as a constant positive influence, simultaneously initiating exercise and providing enjoyment (Kushner et al., 2006). In addition to physical exercise, pets have been found to have a positive impact on nutrition as well, with a study by Edwards (2002) finding that the nutrition intake of residents in a dementia unit significantly improved after the addition of an aquarium into the space. This change is believed to be attributed to the fish's ability to engage the residents, allowing them to spend more time sitting at the table and eating.

Petting animals has been found to cause changes in hormone levels and heart rates. One study conducted by Handlin et al. (2011) examined this by using ten female participants and their

dogs. Participants were instructed to pet, talk to, and interact with their dog, and blood samples were taken from both the dogs and the owners at zero minutes, one minute, three minutes, five minutes, fifteen minutes, thirty minutes, and sixty minutes, and heart rate was monitored throughout (Handlin et al., 2011). The results showed that levels of oxytocin, the hormone associated with warm and fuzzy feelings (Owens, n.d), decreases stress, blood pressure, anxiety levels, and depression symptoms, and increased self-confidence, social interactions, memory, and learning (McCance et. al, 2012) peaked for the owners between one and five minutes (Handlin et al., 2011). Levels of cortisol, the body's stress hormone significantly decreased at fifteen or thirty minutes, and heart rate showed a significant decrease at fifty-five and sixty minutes (Handlin et al., 2011). In addition to changes in the owners, similar results were found for the dogs with oxytocin levels increasing three minutes in and a significant decrease in heart rate at fifty-five minutes (Handlin et al., 2011). Additionally, it has been found that just experiencing being gazed at by their pet significantly increased oxytocin levels in pet owners (Nagasawa et al., 2009). In general, pet owners frequent the doctor less than those without pets with one study finding that senior citizen pet owners enrolled in Medicare experienced a reduction in the need for medical services as well as a reduction in costs for health care (Siegel, 1990). Numerous studies have even found that after suffering heart attacks, patients who owned pets had a higher survival rate, with one study finding that after following up one year after, patients with pets had a 94% survival rate compared to 71% for non-pet owners (Mubanga et al., 2019). Additionally, research has found cognitive and neural benefits of pets as well with research by Menna et al. (2016) finding that compared to no change in the control condition, participants exposed to Animal-Assisted Intervention Reality Orientation Therapy experienced significant improvements in cognitive abilities. Similarly, a study conducted by Bono et al.

(2015) found that dog therapy had the ability to decrease the progressing cognitive impairment caused by Alzheimer's Disease, and Branson et al. (2016) found that the executive functioning of older adults with pets was significantly better than those without pets.

Psychological Benefits of Pets and Implications for Mental Health

In general, pets have been shown to increase well-being and positive emotions. One study surveyed 263 American adults to examine pets' effects on well-being. After administering an online questionnaire, independent sample- t-tests showed that those who owned pets reported being significantly more satisfied with life than those who did not own pets (Bao & Schreer, 2016). Although it is important to acknowledge that the lack of random assignment in this study precludes causal conclusions (e.g., it is equally possible that those who are more satisfied are also more likely to get pets), other research suggests that the presence of pets may have positive effects on people's moods. For example, Janssens et al. (2020) investigated pets' effect on their owners. Over the course of five consecutive days at ten random times each day, fifty-five adult pet owners were asked to reflect on their current affective states in addition to their current experiences and the current context in which they were taking place. Additionally, they were asked if a pet was present, and if so how was their presence appraised and what were their interactions like (Janssens et al., 2020). Using a multilevel regression analysis, the data showed that pet owners experienced less negative affect when their pet was present, and the more interaction reported led to higher levels of positive affect asserting that pets not only serve as protective against negative feelings but can also induce positive ones (Janssens et al., 2020).

Lots of research has pointed to pets as being protective against stress. One study conducted by Shiloh et al. (2003) aimed to study this phenomenon by creating a stressful situation for fifty-eight participants who were informed they may have to hold a tarantula.

Participants were then randomly assigned to one of five groups where they were instructed to either pet a rabbit, pet a turtle, pet a toy rabbit, pet a toy turtle, or the control group who received neither a real animal nor a toy. State-anxiety was measured three times using a questionnaire, in the beginning, after the stressor was introduced, and after the participant completed the manipulation they were assigned to. State-anxiety was heightened after the stressor was introduced and the data found that petting a real animal had a much greater impact on lowering state-anxiety than petting a toy and that there was no significant difference between those assigned to pet the rabbit versus those who pet the turtle. Similarly, pet owners experiencing extreme stress have found that interactions with their pets function as very effective stress management (Gage & Anderson, 1985). Children at doctors appointments displayed fewer signs of behavioral distress, as well as a decrease in physical indicators of stress when a dog was present (Nagengast et al., 1997), physiological as well as psychological indicators of anxiety, were decreased in college students when interacting with a dog (Willson, 1991), and symptoms of state-anxiety were reduced in psychiatric patients when interacting with an animal during a therapy session (Barker & Dawson, 1998). The results of these studies support the findings that voluntarily touching another living thing under safe conditions, whether it is pets or humans, can elicit positive feelings and can decrease negative feelings such as anxiety and stress (Montagu, 1978). And while all of these studies speak to the benefits of touching an animal, some research suggests that merely being in the presence of animals can have benefits such as the study conducted by Clements et al. (2019) that found benefits to human well-being through simply being in the presence of and interacting with an aquarium of fish. In addition to the positive feelings elicited by interactions with pets, it is also believed that there is a cognitive effect. Research by Brickel (1982) posits what is called an attentional shift hypothesis that suggests that

pets divert attention away from stressors, reducing anxiety. This is echoed in Wilkins' (1971) work which asserts that due to the appealing characteristics of pets such as their complexity, unpredictability, interactiveness, and ability to engage multiple senses, they are perfectly equipped to serve as a distraction.

Additionally, pets are beneficial for those dealing with pre-existing mental health problems. One study conducted by Hawkins et al. (2021) administered an online survey to 119 adults, forty-one of whom were diagnosed with a mental health condition and seventy of whom were struggling with their mental health, to assess their experiences with mental health and pets. While not all participants had been formally diagnosed, non-diagnosed mental health struggles such as depression, anxiety, post-traumatic stress disorder, obsessive-compulsive disorder, and schizophrenia were mentioned by participants. After thematic analysis of the surveys, numerous repeating themes emerged highlighting the beneficial nature of pets including increased hedonic tone, increased behavioral activation and motivation, reduction in anxiety symptoms and panic attacks, reduction in loneliness and increased social connections, and reduction of risky behaviors, (Hawkins et al., 2021). One of the themes found was increased hedonic tone, the ability to experience pleasure, which was experienced and expressed by 90%, or 107 of 119, participants (Hawkins et al., 2021). Mechanisms for increasing hedonic tone included humor and laughter, a well-established beneficent of mental health (Gonot-Schoupinsky & Garip, 2019). Additionally, participants reported a feeling of infectious joy as both the pet owners' and pets' moods seemed to increase (Hawkins et al., 2021) which mirrors the previously discussed research that found during interactions both dog and dog owner experienced increased oxytocin levels (Handlin et al., 2011). 92%, or 110 out of 119, participants experienced increased behavioral activation and motivation. Participants expressed that through an increased sense of

responsibility to their pets, they experienced an increase in their overall motivation as well as goal-oriented behavior (Hawkins et al., 2021), both of which are usually low for those experiencing mental health problems (Brown & Pluck, 2000). A reduction in anxiety symptoms and panic attacks was experienced by 111 of the 119 (93%) participants (Hawkins et al., 2021). Participants reported that their pets provided support when experiencing panic attacks, had the potential to prevent the escalation of anxiety to panic attacks, and helped ease PTSD symptoms (Hawkins et al., 2021). These results are similar to other research that points to pets as beneficial in helping people cope with anxiety and PTSD such as research that found significant benefits of equine therapy, or therapy using horses for treating PTSD (Young & Horton, 2019) as well as the ability of canine companions to allow for veterans struggling with PTSD to feel calmer, less lonely, less depressed, and less worried about the safety of their family leading to relief in their psychological distress (Stern et al., 2013). Pets are shown to benefit those struggling with symptoms of anxiety and or PTSD by serving as a distraction and as a way to increase mindfulness (Arditte Hall et al., 2019; Cooney et al., 2010) through physical touch, an important factor in maintaining positive wellbeing as well as lower physiological arousal (Lockhart, 2019), as well as by proving emotional support (Hawkins et al., 2021). Additionally, Colombo et al. (2006) looked into pets' effects on anxiety in older adults and found that those who cared for a bird experienced significant positive changes in their anxiety based on the Brief Symptom Inventory. Improvements were seen in phobic anxieties as well as obsessive-compulsive behaviors.

Similar to the results of a survey of pet owners and non-pet owners that found that 85% of respondents agreed that interaction with pets can decrease loneliness, 80% of pet owners reported their pet makes them feel less lonely and 54% of them said their pet helps them connect

with other people ("Social Isolation & Loneliness," n.d.), 115 of the 119 (97%) participants experienced increased social connection and a reduction in loneliness, a known detriment to mental health (Hawkins et al., 2021). One way this is seen is that owning a pet serves as a catalyst for social interactions and connectedness. Creating bonds and connections is made easier through the presence of similar interests related to owning a pet (Hawkins et al., 2021). These results are similar to those found in research on loneliness in unhoused youth in the U.S. (Rew, 2000). Thirty-two unhoused youths aged sixteen to twenty-three completed focus groups that collected qualitative data regarding how lonely they felt, circumstances that provoked loneliness, and how they coped with loneliness. The results showed that in addition to being with friends, animal companions served as one of the primary coping strategies as they provided safety, unconditional love, and a reason to keep going (Rew, 2000).

In addition to increasing positive behaviors, 102 of the 119 (86%) participants experienced a reduction in risky behaviors such as self-harm and suicidality (Hawkins et al., 2021). Participants reported that a big factor in the reduction of suicidal ideation and even the prevention of a suicide attempt was the worry about their pets' needs being fulfilled (Hawkins et al., 2021). Additionally, numerous participants expressed that owning a pet increased feelings of purpose, a crucial element in quality of life (Ryff & Keyes, 1995), gave life more meaning, and for some, even served as a reason to live. Similarly, research conducted by Brooks et al. (2016) found that of the participants who identified their pets as having an important role in their daily management of mental health and well-being, sixty percent placed their pets in the most important grouping of support (Brooks et al., 2016).

Depression can be onset by varying factors for each person and many of the physiological and physiological benefits of pets already discussed serve as protective against and beneficial for

those struggling with depression, such as increased oxytocin, decreased loneliness, more social connection, and increased physical activity. In addition to this, research has found that participants assigned to Animal-Assisted Intervention Reality Orientation Therapy, a form of therapy that views behaviors as choices and is designed to improve cognitive function in those who experience confusion and disorientation (*8. Be Selective with Reality Orientation | ATrain Education*, n.d.) were significantly less depressed than those participating in just Reality Orientation Therapy (Menna et al. 2016), and when investigating a sample of older Korean adults Ko et al. (2016) found that those who were assigned to care for a cricket experienced greater changes in depressions scores and significantly lower depression scores compared to those in the control group. These studies suggest that the effects of caring for pets are not limited to mammals - or even live pets. In fact, recent research found that even caring for robotic pets has positive impacts (Fogelson et al., 2022). The study conducted by Fogelson et al. (2022) investigated the effect of these robot companion pets on individuals living with dementia. There are numerous effects of dementia, with some of the behavioral and psychosocial symptoms including depression and loneliness (Fogelson et al., 2022). Eighteen participants living in dementia care facilities in the Northeastern United States were given a robotic dog or cat based on what they chose and were instructed to interact with it however they wanted for six weeks. Participants completed a pre-intervention assessment and then an assessment again at three weeks and six weeks. Analysis of the assessments found a significant improvement in the form of a decrease in both loneliness and depression in the participants (Fogelson et al., 2022). This research proves especially useful for individuals who may not be able to own a real pet for whatever reason and has implications for other non-living pet interactions such as Tomagotchis,

a handheld virtual game that involves caring for a virtual pet, and other virtual pet care games, though further research is required to investigate this claim.

Benefits of Pets as Part of Mental Health Interventions

Pets can serve as an important facet of psychological intervention as seen through the rising popularity of pet-assisted therapies with around 500,000 service dogs being used in America (Mueller, 2022), 60% of hospice services offering animal-assisted therapy (Whiteman, 2014), and numerous institutions utilizing visit from therapy dogs and other animals. Additionally, pets provide some conveniences not awarded by typical mental health treatments such as seeing a psychologist, counselor, or psychiatrist due to the associated stigmas, prices, and wait times. In terms of wait time, the national average wait time for mental health services was seven and a half weeks pre-pandemic, and due to the increased mental health struggles and associated demand as a result of the pandemic, these problems were only exacerbated (Niederberger, 2016). This is largely due to the lack of availability of professionals in these fields (Boyd, 2014) with reports estimating that in a few years the United States alone will be short between 14,280 and 31,109 of the psychiatrists, psychologists, and counselors needed to treat those suffering from mental issues (Weiner, 2022). And even if mental health care is available, it is not always appropriate and effective for the patient for many reasons such as lack of cultural competency and racial and ethnic biases brought on by lack of diversity within the workforce. As of 2015, 86% of the psychologists in America were White, 5% were Asian, 5% were Latinx, 4% were Black, and 1% were multiracial or from other racial/ethnic groups, significantly less diverse than the actual racial and ethnic makeup of the United States (Lin et al., 2018). Additionally, price is a huge barrier for many with the average cost of mental health services falling between $100 and $200 per session exacerbated by the fact that insurance companies are not required to

cover mental health benefits (Lauretta, 2021) plus the addition of potential costs of medication if prescribed. Lastly, regardless of the efforts made to normalize mental health, there is still ample stigma surrounding mental disorders and treatments including self-stigma and stigma from others. A study of 90,000 people worldwide found that 12.6% did not receive mental health treatment out of fear of their community or neighbors having a negative opinion, 12% said it was because they feared it having a negative impact on their job if someone found out, and 9% simply said they did not want anyone to know. There are many negative beliefs about those with mental illness caused by stigma. For exmaple, 7%-8% of people in developed countries and 15%-16% of people in developing countries believe people with mental illness are more violent, 15% of people believe those with mental illness are a burden to society, and 53% do not agree that people are understanding and sympathetic to those with mental illness (Clark, 2021). For many adopting a pet serves as a quicker, cheaper, and less stigmatized way to potentially benefit, provide relief, and protect against mental health issues.

Chapter 3: Limitations of Pets in Coping with Mental Health Challenges

While there are numerous benefits to owning pets it is unrealistic to think that pet ownership is a panacea. Though the benefits, as discussed earlier, are multiple, there are other factors that can hinder or complicate pet ownership as the main avenue for mental health care. Most notably, pet ownership requires a substantial investment of time, energy, and resources. Costs and expenses can serve as huge drawbacks and barriers for those considering getting a pet. If adopting from a shelter, adoption fees can range on average from $129 to $767 for dogs and puppies, $39 to $317 for cats and kittens, and $9 to $199 for birds, rabbits, and other small animals (*Adoption Fees*, n.d.). Purchasing a pet from a pet store or breeder is even more expensive with pet store prices for dogs ranging from $750 to as high as $3,500 for some breeds (<*petstores-Prices*>, n.d.), and similar prices of $500 to $3,000 from breeders (Neff, 2020). Vet bills, even for a basic physical and check-ups, can range from $90 to $300 which does not account for other potential vet expenses such as heartworm testing, ear care, flea control, fecal exams, dental care, allergy testing, spaying and neutering, vaccinations, and any necessary medications (Cook, n.d.). Additional expenses attributed to food, toys, treats, grooming, and any other necessary purchase to care for your pet add up to an average cost of $480-$3,470 per year for a dog working out to $40-$290 per month (*Cost of Owning a Dog*, 2022), and an average of $634 per year and $53 a month for a pet a cat (*How Much Does It Cost to Have a Cat?*, n.d.). On top of costs, pet-related allergies are very common. Pet allergies are caused by an allergy to the protein in pets' dander such as dead skin cells, saliva, and urine which can then be collected in the pet's fur, feathers, or hair (*Allergic to Your Pet? Learn About Dog and Cat Allergies*, n.d.). 10-20% of the world population have allergies to cats and or dogs, but allergies to other pets such as rabbits, ferrets, hamsters, guinea pigs, horses, and birds are common (*Allergic to Your*

Pet? Learn About Dog and Cat Allergies, n.d.). There is a wide array of possible symptoms those with pet allergies can experience including sneezing, runny nose, stuffy nose, coughing, swelling and itching of the nose and eyes, hives, itchiness on the throat or roof of the mouth, disruption of sleep, fatigue, and irritability, making it impossible or at the very least unpleasant to own a pet (*Allergic to Your Pet? Learn About Dog and Cat Allergies*, n.d.). In some cases, newly developed or pre-existing allergies may make it necessary for a pet owner to deal with an additional chronic health condition that may even necessitate having to find a new home for the pet. In terms of hypoallergenic pets, some people can tolerate different breeds better, but all pets carry allergens (*Allergic to Your Pet? Learn About Dog and Cat Allergies*, n.d.).

Additionally, for some suffering from mental health issues, owning a pet, despite the numerous benefits, very well may not be enough to relieve their mental anguish. Pets cannot and should not be sole substitutes for professional care and treatment of chronic physical and mental health conditions. Many people require other interventions such as seeing a trained mental health professional for psychotherapy and/or a physician for the prescription of medications. For example, as of 2020, 41.4 million adults in the United States alone were receiving mental health treatment such as seeing a counselor (*Mental Health Treatment or Counseling among Adults U.S. 2002-2020*, 2020), and in 2019 15.8% of all U.S adults reported taking medication for their mental health (*Products - Data Briefs - Number 380 - September 2020*, 2020). The COVID-19 pandemic only exacerbated these statistics with 84% of psychologists reporting an increase in the number of those reaching out for anxiety treatments, 72% reporting an increase in those needing help with depressive disorders, and increases in demand for treatment for numerous other mental health issues such as sleep-wake disorders, obsessive-compulsive disorders, and substance-related and addictive disorders (Bethune, 2021). Additionally, research has shown that

just owning a pet is not enough to activate all of the potential benefits, but that a positive relationship with pet ownership and the pet themselves is what produces the majority of the previously discussed benefits (Wong et al., 2019). In other words, "just" owning a pet is not enough - if the cost and caretaking of a pet feels more stressful than rewarding, the benefits of pets may not be experienced. Additionally, some research has even shown that in certain situations pets can actually function as a detriment to mental health, exasperating some of the struggles already felt. Broadly, pets can cause the owner to feel negative feelings about themselves in regard to their ability to own a pet (Hawkins et al., 2021). One specific study by Hayden-Evans et al. (2018) found that individuals with borderline personality disorder experienced negative feelings surrounding being a pet owner including fear, worry, and guilt. Guilt most notably as it has been shown to play a role in many mental health difficulties (Kim et al., 2011), but was a common feeling expressed among participants for numerous reasons, most often surrounding not providing adequate care (Hayden-Evans et al., 2018). The potential for negative feelings caused by pet ownership is additionally troubling when taking into consideration the fact that research has shown that some pets can pick up on humans' emotions and then in turn display parallel emotions themselves (Sundman et al., 2019). Additionally, experiencing the death of a pet can be incredibly challenging and painful, with research showing the experience can be as severe as dealing with the death of a human (Lee, 2020). Studies have found that people can experience the same symptoms of dealing with the death of a human and for the same duration (Lee, 2020). These experiences are only exacerbated by more deep and meaningful relationships with a pet, something found to be very common with a recent Pew survey reporting that more American dog owners are closer to their dog than their own mother or father (Taylor et al. 2006).

Conclusion

The COVID-19 pandemic brought with it a new virus, sickness, death, and a complete halting and altering of what was considered normal life - and a plethora of accompanying mental health issues. With 4,806,299 confirmed COVID cases and 318,599 deaths just two months after the declaration of the pandemic (Ciotti et al., 2020), and 642,380, 614 confirmed cases and 6,622,871 deaths as of November 2022 (*COVID Live - Coronavirus Statistics - Worldometer*, 2022), the spread of the virus is and was rapid and deadly. To counter the spread, restrictions and guidelines were put in place all over the world, upending social and occupational life as we knew it. The isolation of the early months of the pandemic coupled with the impending fear of catching or spreading the virus, and suffering the consequences of infection dealing with the grief of losing a loved one, and the drastic changes to life caused a wave of mental health issues. Loneliness emerged as not only a prominent cause of mental health issues but also carries many negative effects itself with the potential to lead to a myriad of negative effects seen physically, emotionally, behaviorally, and cognitively (Hawkley & Cacioppo, 2010).

In an attempt to buffer these negative effects of the pandemic, numerous people turned to adopting a pet or utilizing their pets already at home with increased searches into pet adoption around the beginning of the pandemic (Ho et al., 2021), and 23 million (or one in five American households) adopted a cat or a dog since the pandemic began (*New ASPCA Survey Shows Overwhelming Majority of Dogs and Cats Acquired During the Pandemic Are Still in Their Homes*, n.d.). Pets have been found to have numerous benefits for physical health, mental health through physical, emotional, psychological, and hormonal changes that increase the general well-being of those they live and or interact with, as well as serving as beneficial for those dealing with pre-existing mental health conditions. The positive impact increases when taking

into account the conveniences pets provide over other avenues of mental health care such as cost (Lauretta, 2021), wait times (Weiner, 2022), effectiveness of mental health care providers and medication, as well as the attached stigmas (Clark, 2021).

Despite the copious benefits of pet ownership, pets are not and should not be used as a substitution for alternative and sometimes necessary mental health interventions. There are also multiple factors with the potential to hinder and complicate pet ownership and the possible benefits including costs and allergies (*Adoption Fees*, n.d.; Cook, n.d.) Additionally, just owning a pet is not enough as developing and maintaining a positive relationship is necessary to activate all of the potential benefits (Wong et al., 2019). In some cases for those dealing with pre-existing mental health conditions pets can even exacerbate the struggles already felt through negative feelings related to inadequate care (Hawkins et al., 2021) as well as the experience of the death of a pet (Lee, 2020). Additionally, if a pet is living in a multi-person household it is possible that not everyone is receiving the same benefits due to differing experiences. Individuals may have different relationships with their pets based on if they actually want the pet, their level of love and commitment, and individual pros and cons. For example, there can be lots of necessary maintenance to properly care for a pet such as feeding, walking, grooming, cleaning up after, and possible medical care. The possibility of the majority or all of these responsibilities falling on one individual may have an impact on the relationship with the pet and what benefits are received. In households that consist of a man and woman in a heterosexual relationship, it is reported that typical household labor and chores fall majority on the woman (*How Men and Women View Family Life, Household Duties during COVID-19 | Pew Research Center*, 2021) and pet specific research has found it is the same for pet care with the woman doing the majority (The Brussles Times, 2022). Same-sex couples split up chores and labor more evenly, however,

once children are added into the equation labor is often split similarly to heterosexual couples but with it often depending on earnings (Miller, 2018). While there is no pet-specific research, it is not unreasonable to assume that pet maintenance and chores may end up being split the same way, but further research is required to investigate not only this claim but also the potential difference in the reception of pet-provided benefits by different members of a multi-person home.

Despite the caveats, it is abundantly clear that pets have the potential to have huge impacts on mental health, physical health, and general well-being. In addition to individual or household ownership of a pet, this should be extended to and considered by other facets of life such as schools, colleges, retirement communities, doctor's offices, libraries, jails, and more. This incorporation of animals into these spaces is not a new or novel idea and has boasted great success when implemented. Therapy dogs in schools have shown numerous benefits such as increased attendance, improved confidence, strengthened and improved relationships among teachers and peers, and reduced anxiety related to learning as academics have been found to benefit. For example, a study conducted by the University of California found that students participating in a reading program with the addition of dogs experienced an increase in reading fluency by 12% to 30% (*How do Therapy Dogs Help in the Classroom?,* 2022). The presence of therapy animals has been shown to be beneficial with older students at colleges and universities as well with studies finding that students who spent time in classrooms with dogs experienced improved happiness and energy levels (*How do Therapy Dogs Help in the Classroom?,* 2022). These benefits are also seen in prisons with animal-assisted therapies producing improvements in mental health, emotional control, empathy, and academic skills, all common struggles among those in prison (Villafaina-Domínguez et al., 2020). Airports have also utilized pets to help

potentially anxious flyers, an initiative that is growing with 48 programs in 2017 to then 58 in 2018 and spreading across the world with the first introduction in an airport in the UK in 2018 (*A Complete Guide about Therapy Dogs in the USA Airports*, 2019). The incorporation of animals into these spaces can provide a way for people to reap the benefits of interactions with pets without actually owning one themselves as it is not a possibility for everyone or in addition to owning a pet but in a space where their pet would not usually be, an idea that requires further research and should continue to be explored and implemented. Regardless of what the setting is, everyone and anyone has the ability to benefit from pets. Whether it is through petting, interacting with, or simply being gazed at, pets have a huge impact on people's lives. Regardless of if their impact on physical and mental health is known, through the provided love, companionship, and happiness, the benefits of pets are deeply and widely felt.

Methods

The purpose of this chapter is to review the techniques used in the investigation conducted into whether adopting a pet or utilizing a pet already in the household was an effective way to buffer the mental anguish caused by the COVID-19 pandemic.

Search Engines and Databases. Google, Google Scholar, and the Allegheny College Library resource Aggregator were used to access relevant articles. Through the initial search engines, numerous psychology, and medical journals and databases became prevalent. These include Taylor & Francis Online, Pubmed.gov, National Library of Medicine, Wiley Online Library, Science Direct, APA PsycNet, SAGE Journals, BMC Psychiatry, International Journal of Clinical and Health Psychology, CDC.gov, American Association for the Advancement of Science, Journal of Personality and Social Psychology, Proquest, JAMA, BioMed Central, and Frontiers. Additionally, standard Google searches were conducted for fact-finding purposes, e.g., data on pet adoption fees, the extent of the mental health crisis as a result of the COVID pandemic, pet allergy information, etc.. Reputable national news outlets (e.g., *The New York Times, The Washington Post, Smithsonian Magazine*) and professional organizations (e.g., *Asthma and Allergy Foundation of America, American Psychological Association, Animal Humane Society, American Society for the Prevention of Cruelty to Animals)* were prioritized. Articles published outside of these sources (e.g., on personal blogs or websites, social media, etc.) were not consulted.

Search Terms. To investigate the proposed thesis, numerous search terms were applied depending on the subject matter of the chapter. See Table 1 for key words used in each search, organized by chapter. There were no exclusion criteria when sourcing articles by country of

origin, publication date, or type of pet. However, particular emphasis was given to articles published during or after the COVID pandemic (i.e., 2020 and beyond) as that was the focus of the paper.

Procedure. Once articles were found, they were evaluated to determine if they would be a helpful contribution to the investigation. To do this, first the abstract was read to make sure the content of the paper was relevant and accurate to what was being searched for. If it was, the results were then read to gauge how exactly the research went, and if the outcome was applicable to the specific topic being researched.

Table 1.

Search Terms by Chapter

Chapter 1: COVID-19's Impact on Mental and Physical Health	**Chapter 2: Pets' Impact on Mental and Physical Health**	**Chapter 3: Limitations of Pets and Coping with Mental Health Challenges**
COVID timeline, number of deaths from COVID, Number of Covid infections, How is COVID spread, measures to stop COVID spread, COVID shutdowns, COVID lockdowns, mental health and COVID, mental health issues and COVID, depression, and COVID, coping with COVID, coping strategies during Covid-19 Pandemic, schools closings COVID, remote work during the Pandemic, mental health and remote work, COVID travel bans, closings due to COVID, and sports during COVID, social rejection, social pain, effects of loneliness, loneliness and depression, loneliness and anxiety, loneliness and mental health, loneliness and physical health, negative effects of loneliness, social acceptance, need to belong, and loneliness during COVID-19 pandemic	How many people own pets, history of owning pets, pets and well-being, pets and happiness, pets and loneliness, pets and depression, pets and anxiety, pets and PTSD, pets and obsessive-compulsive disorder, pets and mental health, pets and physical health, pets and recovery, pets and physical activity, pets and oxytocin, benefits of petting animals, benefits of pets, benefits of interaction with pets, factors that influence pet ownership, robotic pets, and pet adoption and COVID	Average cost of adopting a pet, average cost of pets from pet store, average cost of pets from breeders, average cost of owning a pet, average cost of a vet visit, pet allergies, pets causing mental health problems, how many people see a psychologist, and how many people use medication to treat mental health problems.

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