The Human-Animal Bond, Human Social Support and Resilience: Understanding Relationships that Aid Through Adversity

Lian Michelle Hill

School of Psychology

The University of Adelaide

A thesis submitted in partial fulfilment of the requirements for the combined degree of

Doctor of Philosophy and Master of Psychology (Clinical)

February 2021

Table of Contents

Declaration

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

I acknowledge that copyright of published works contained within this thesis resides with the copyright holder(s) of those works.

I also give permission for the digital version of my thesis to be made available on the web, via the University's digital research repository, the Library Search and also through web search engines, unless permission has been granted by the University to restrict access for a period of time.

I acknowledge the support I have received for my research through the provision of an Australian Government Research Training Program Scholarship.

Lian Hill

February 2021

Outline of Candidature

This thesis contributes to a body of work undertaken as part of the requirements for a combined Doctor of Philosophy / Master of Psychology (Clinical) degree at the University of Adelaide, South Australia. This degree program (equivalent 4 years full time) is comprised of a Master of Psychology coursework and clinical placements, together with the Doctor of Philosophy research load. The three manuscripts presented in this thesis, as well as seven post-graduate level subject courses and three major, and one minor, clinical placements (with a combined total of over 1000 clinical hours) were completed. Funding for this project was provided by the School of Psychology, University of Adelaide, permitting the purchase of a measure and registration for online data collection website Survey Monkey.

Acknowledgements

There are many to whom I owe my gratitude and thanks for the support they have provided in bringing this PhD project to fruition. Firstly, my sincere thanks to my supervisors Emeritus Professor Helen Winefield and Professor Pauleen Bennett for your expertise and knowledge, I feel fortunate to have learned from you both. To Helen, thank you for your sustained support, gentle encouragement, and sound guidance, I'm truly grateful.

Thank you to senior statistician Suzanne Edwards from the School of Public Health, The University of Adelaide, for your patient explanations and sound advice as I navigated through the numbers.

Thank you to all the people who participated in this research, in particular the seven women who candidly shared their stories with me. I learned so much from your experiences and felt humbled by your trust. Thank you to all the researchers, past and present, in the field of Human-Animal Bond research for building a foundation for me to develop my research.

To my fellow peers, both in Masters and PhD, I'm so grateful for the friendships and support through this undulating journey. Warmest thanks to Carly for sharing the good times with the bad, and always having kind words of encouragement.

A monumental thank you to all of my family for the encouragement and support. To my Mum, I owe the deepest gratitude for everything you have done, believing in me, being my biggest cheerleader, and teaching me the value of digging deep and persisting. To Chris, thank you for your unwavering certainty in me and carrying the real-world load so I could immerse myself and get to the finish line, I'm forever grateful.

This thesis is dedicated to Goldie. You joined the journey halfway through and have taught me so much, nothing like watching a toddler to learn tenacity. You inspire me every day to find joy in the simple and keep laughing. I hope this paves the way for you, to always know you can do great things.

Thesis Abstract

The Human-Animal Bond (HAB) has been shown to provide a buffering effect for stress and adversity. Based on gaps within the literature, this thesis takes a strengths-based approach to investigating the HAB, human social support and resilience, a construct not previously explored within the HAB field of research. This thesis builds upon previous findings that social support is a protective factor for resilience by investigating whether the HAB may be comparable with human social support. Given research into the HAB reported on the complexities of the HAB and associated methodological limitations, this thesis aims to produce outcomes based on methodological rigour and a theoretical framework that emphasises the strength of the bond as having an impact on mental health outcomes.

Utilising a mixed methods research design, the thesis is comprised of two quantitative studies and one qualitative study. A two-way approach with follow-up exploratory design enhances the credibility and validity of the outcomes and improves upon the research methodologies used within the HAB field of research. The first study of this thesis examines a large sample ($N = 538$) of companion animal owners and non-owners to determine whether the HAB would moderate the relationship between human social support and resilience, and whether the relationship between the HAB and human social support may be curvilinear. That was followed by a descriptive study to establish what subpopulation most likely had low to moderate levels of human social support and strong HAB, and was therefore potentially at risk of lower levels of resilience. Finally, a subpopulation of women was explored to understand the comparability of their animal companion and human relationships, as well as whether their companion animals aided through adversity.

Study One was a rigorous cross-sectional study that found the HAB was not a significant moderator between levels of human social support and resilience for companion

animal owners. However, there was a significant curvilinear relationship between the HAB and perceived human social support, suggesting extremely weak or strong HABs may be correlated with a reduced capacity to build resilience and process adversity. The dataset from Study One was further explored for Study Two and found single women were more likely to have low to moderate human social support and strong bonds with their companion animals.

Study Three was a qualitative study that explored women who recorded scores of low to moderate levels of human social support and strong HAB. Semi-structured interviews were conducted with seven women and thematically analysed, finding that women preferred their companion animals over their human social supports, that companion animals provided strong emotional support and were considered a strong protective factor in supporting women through adversity and against suicide.

Despite some methodological limitations in this thesis, it contributes knowledge to the HAB literature base, including alternative explanations as to how outcome measures are interpreted, such as finding a curvilinear relationship between the HAB and human social support (Hill et al, 2020), as well as understanding women companion animal owners' relationships. The mixed methodological approach utilised in this thesis has implication for the HAB field of research to consider similar research design and improve upon reported methodological weaknesses. The implications for mental health clinicians providing therapeutic care to individuals experiencing adversity, particularly suicidality, are significant.

List of Publications

Hill, L., Winefield, H., & Bennett, P. (2020). Are stronger bonds better? Examining the relationship between the human-animal bond and human social support, and its impact on resilience. *Australian Psychologist, 55*(6), 729-738. doi:10.1111/ap.12466

List of Presentations

Hill, L. (2020, June 2). Are stronger bonds better? Examining the relationship between the human-animal bond and human social support, and its impact on resilience. *Australia Broadcasting Corporation, ABC News Report.*

List of Tables

List of Figures

Thesis Overview / Exegesis

This thesis focuses on the relationships between human-animal bond (HAB), human social support and resilience. Chapter One provides a critical review of the literature base and provides a contextual background to the constructs examined in the thesis. Research aims and questions were generated as an outcome of the literature review and are presented at the end of the chapter. Chapter Two offers a detailed methodological overview of the research design implemented for the thesis as a whole, as well as each individual study. The thesis utilised a mixed methods research design in an effort to improve upon methodological weaknesses reported within the literature.

The thesis' first study, presented in Chapter Three, set out to explore whether the HAB moderated the relationship between human social support and resilience, in particular for those with lower levels of human social support. Given the HAB did not moderate the relationship between human social support and resilience, a curvilinear relationship was explored. The second and third studies, Chapter Four and Five respectively, expanded on the outcomes of the first study by exploring what subpopulation most likely had lower levels of human social support and stronger HAB, how women's human and companion animal relationships compared, and whether their companion animal impacted coping with adverse experiences.

Finally, Chapter Six summarises and discusses the main findings from the studies, highlights the contributions to the HAB literature and methodology, and outlines the clinical implications for psychologist and other mental health practitioners. Methodological strengths and weaknesses are discussed, as well as directions for future research. References and appendices are presented at the end of this thesis, as is the published version of Study One.

Chapter 1. Literature Review

1.1 Adversity and Mental Health

The occurrence of stress and adversity in everyday life is a reality, as is some probability of exposure to more significant traumatic events. Stress, adversity and trauma impact on mental health and can result in various psychopathologies (Höltge, Mc Gee, Maercker, & Thoma, 2018; Seery, Holman, & Silver, 2010; Southwick, Bonanno, Masten, Panter-Brick, & Yehuda, 2014). Furthermore, prolonged, ongoing and chronic exposure to adversity and challenging circumstances can be a prelude to both significant psychological and physical illness (Rutter, 1985; Southwick & Charney, 2012). Approximately 45% of Australians (7.3 million) aged 16-85 years will experience a mental health condition in their lifetime, with one in five Australians experiencing mental ill-health, which contributes to 12% of Australia's disease burden (Australian Institute of Health and Welfare [AIHW], 2018). The estimated cost to the Australian economy is $43 to $51 billion per year, as well as approximately $130 billion associated with diminished health and decreased life expectancy for those experiencing mental health conditions (Productivity Commission, 2019). Hence, there is a growing need for the enhancement of individual strengths that aid in buffering against mental health decline.

Threats to an individual's ability to cope and subsequent need for positive adaptation of individual strengths, may include events such as interpersonal and domestic violence, other dysfunctional relationships, divorce, losses and grief, history of trauma or abuse, exposure to familial psychopathology, war, natural disaster, injury and illness, bullying, poverty, and climate change (World Health Organization [WHO], 2012). Seery et al., (2010) stated that the more adverse an experience will result in worse mental health outcomes, yet

claimed some exposure to adversity within the lifetime predicted lower distress and functional impairment and increased satisfaction with life. Similarly, in being able to cope with adversity and reduce aversive related stress, research findings suggest that an average of 50% of individuals that are exposed to severe hardship or stressors do not develop adversarial reactions, in that most people do not develop psychopathology following stressful experiences (Bonanno, 2004; Rutter, 1985).

1.2 Resilience, a paradigm shift

The study of psychopathology and related mental health has mainly focused investigations toward risk factors, trauma outcomes and susceptibility towards the development of mental illness (Richardson, 2002; Seligman, 2011; Southwick et al., 2014). However, there has been a gradual paradigm shift away from this reductionist, problem-oriented approach towards focusing on factors and mechanisms that promote positive psychological mental health and develop the ability to recover quickly after exposure to adversities and stressors. Therefore, a strengths-based approach may be used to determine healthy development despite risk and look at building strengths and competencies related to positive outcomes and encourage the prevention of mental health conditions (Fergus & Zimmerman, 2005; Windle, 2011). One such strength is resilience, which research suggested led to the development of positive psychology, as learning more about the characteristics of those who exhibit positive coping skills in the sight of adversity can encourage building such strengths when an individual is under duress (Lemay & Ghazal, 2001). Furthermore, in the context that resilience is conceptually related to the principles of positive psychology, building resilience is aimed at preventing psychopathology development after an individual is exposed to stress, adversity or trauma (Rutten et al., 2013).

Resilience is more than the absence of pathology and involves maintaining wellbeing, as individuals have the capacity to develop through adversity with the potential for incurring growth (Panter-Brick & Leckman, 2013; Richardson, 2002; Yehuda et al., 2013). Research suggested that resilience can be taught and enhanced based on who an individual is, what adversity has occurred and what their current situation is (Connor & Davidson, 2003; Southwick, Bonanno, et al., 2014). Given the cost and impact of mental health conditions (AIHW, 2018), there is a growing need for the enhancement of individual strengths that aid in buffering against mental health decline, namely, resilience. Furthermore, engaging with resilience as a concept, aids health professionals to identify, use, and cultivate client strengths and resilient qualities (Richardson, 2002). Lastly, Windle (2011) states that resilience has the ability to impact on health, well-being and quality of life, highlighting the relevance and validity of resilience within practice and policy.

1.3 Definition of Resilience

Research has reported on the complexity and challenges in developing a consistent definition of resilience (Haskett, Nears, Sabourin Ward, & McPherson, 2006; Masten & Obradović, 2006; Windle, 2011). What may be recognised and understood in lay terms as relatively simple, the concept of resilience has been shown to be a complex construct within the evidence base (Bonanno, 2012; Liu, 2015; Windle, 2011). The growing interest and relevance of resilience, both empirically and colloquially, necessitates having a clear operational definition in relation to reliable research (Southwick et al., 2014). However, such complexities may be explained by the dynamic process that enables an individual to effectively negotiate, adapt to, and/or manage sources of stress, adversity or trauma over the lifespan (Windle, 2011).

American Psychological Association (American Psychological Association [APA], 2014) described resilience as the process of adaptation that occurs as a result of adversity, trauma and stress. However, according to Southwick, Douglas-Palumberi, and Pietrzak (2014) this definition does not encompass the complexity of resilience, which is described as multifaceted with interacting factors such as biological, psychological, social and cultural, and results in how an individual will respond to adverse events. Similarly, Windle (2011) suggested that individuals have assets and resources within their environment which facilitate the ability to adapt, or "bounce back" when faced with adversity. Conclusively, resilience is multidimensional concept, which varies with context, age, time, gender, individual environment and culture, and an individual's personal qualities allowing them to thrive when faced with adversity (Connor & Davidson, 2003; Kim-Cohen & Turkewitz, 2012). It appears individual differences in resilience explains how an individual faces adversity and fosters resilience, which therefore explains the variation in definition across contexts and multiple domains.

Masten (2014) provides a summative definition of resilience as a dynamic system having the capacity to positively adapt to challenges that threaten the systems development or ability to function effectively, and suggested that to determine if an individual is resilient there are two components to take into consideration: firstly, whether an individual is exhibiting behaviours that indicate effective coping, and secondly, whether an individual has experienced a degree of adversity that has threatened the ability to cope effectively and promote positive outcomes (Masten & Obradović, 2006). Yet, as resilience is not a fixed feature, it is the interaction between an individual and their extensive environment that will contribute to the level of resilience (Egeland, Carlson, & Sroufe, 1993; Rutter, 1993). Specifically, it is an interaction of risk and protective factors within individuals' environment

that contributes to their level of resilience (Garmezy, 1991; Luthar, Doernberger, & Zigler, 1993; Rutter, 1993).

1.4 Resilience as a Process

Resilience and Resilience Theory is a framework that aids in the development of intervention and research (Richardson, 2002). There are three main orientations of resilience; trait, outcome, and process, however much research has suggested that psychological resilience is mostly process driven (APA, 2014; Bonanno & Burton, 2013; Harris, Gooding, Haddock, & Peters, 2019; Hu, Zhang, & Wang, 2015; Johnston et al., 2015; Masten, 2014; Panter-Brick & Leckman, 2013). Resiliency has been described as the process of coping with adversity in a way which effects the ability to build resilient qualities such as protective factors, also referred to within the literature as positive adaptation (Luthar, Cicchetti, & Becker, 2000; Richardson, 2002; Windle, 2011). Similarly, Friedli (2009) proposed positive adaptation as protective factors and assets moderating risk factors resulting in a reduction in negative outcomes. Overall, the outcomes of resilience are proposed as a return to normal functioning, or potentially an increase in development and functioning, despite exposure to adverse life events (Richardson, 2002; Windle, 2011). There are various pathways to achieve resiliency as a process of positive adaptation that takes place in the context of adversity (Bonanno, 2004; Connor & Davidson, 2003; Garmezy & Rutter, 1985; Windle, 2011).

Bonanno (2004) describes a stable trajectory of healthy functioning after the occurrence of adversity, which involves a short period of disequilibrium followed by a return to stable health. However, Yehuda et al. (2013) suggested individuals have the capacity to develop through adversity, with the potential of incurring growth, through ‘reintegration’ which includes a conscious effort to reintegrate positively based on learned experiences.

Similarly, a conceptual model proposed by Richardson (2002), The Resilience Process Model, suggested that a biopsychospiritual homeostasis exists within an individual, in turn this homeostasis is affected by adverse life events and resilient factors. Richardson (2002) described 'biopsychospiritual homeostasis' as the "state of mind, body, and spirit" an individual achieves when they adapt to their environment and circumstances, the interaction of risk and protective factors when faced with adverse events. When homeostasis is disturbed by adverse events or stressors in an individual's life, there is a conscious and unconscious amalgamation that takes place by the individual and leads to one of four outcomes: 1) the process of resilience which will result in growth, self-awareness and increased resilience, 2) a return to homeostasis, 3) reintegration to homeostasis but with loss, or 4) dysfunctional reintegration. Finally, Richardson (2002) found that reintegration process to be an introspective experience in determining one's own resilient characteristics, determining accessibility to these, and nurturing them if deemed useful and appropriate. Many research findings agree that protective factors play an important, dynamic role which interacts with risk factors, enabling positive coping mechanisms and reducing the effects of adversity (Windle, 2011).

1.5 Risk and protective factors in resilience, namely social support

Many characteristics of resilience are described within the literature. Predictors of resilience include social resources, personality, economics, and genetic factors. Bonanno, Westphal, and Mancini (2011) proposed that no single predictor accounts for a large proportion of variance, but there are many contributing factors. Various internal and external qualities were found to enhance the ability to "bounce back", namely, protective factors such as secure and stable social supports, sense of purpose, sense of mastery, economic stability, emotional regulation (Masten, 2014; Richardson, 2002; Southwick et al., 2014). Other

characteristics which influence levels of resilience include historical and current context, life circumstances, gender, age, positive emotions and culture (Bonanno, 2004; Garmezy & Rutter, 1985; Rutter, 1985; Seligman & Csikszentmihalyi, 2000). Conversely, threats are considered 'risk factors', a situation or individual quality that may increase the chances of a negative outcome of life events, including interpersonal relationship difficulties, poverty, grief (Luthar et al., 1993; Zuckerman, 1999). The balance of risk and protective factors evident in an individual's life may influence their ability to positively adapt effectively, therefore, leading to an overall range of outcomes in adaptation to adverse challenges (Rutter, 1999).

McLean, Maxwell, Platt, Harris, and Jepson (2008) identified risk and protective factors for suicide and suicidal behaviour and found risk factors included mental illness and prior self-harm; substance misuse; epilepsy; personality traits such as hopelessness, neuroticism, extroversion, impulsivity, anger and anxiety; eating disorders; a genetic predisposition; menstrual cycle, pregnancy and abortion; unemployment and poverty. However, the protective factors included coping skills, reasons for living, physical health and activity, positive family connectedness, supportive schooling experience, social support, religious affiliation, employment, and access to health treatment and professionals. Similar to other findings, they concluded that risk and protective factors have varying effects on individuals and communities at different times and circumstances in the lifespan, yet such factors should be considered when attempting to enhance resiliency and reduce suicide and suicidal behaviours.

Southwick et al. (2014) claimed that one main approach to enhance resilience is to promote health family and quality social support relationships for the ultimate development

and operation of an individual's natural protective system. Similarly, Masten (2014) emphasised that as a social species, human resilience is largely embedded in close social supports, including emotional security. Although an individual's capacity to be resilience is based on the interaction of such systems and environment (Rutter, 1993; Luthar, Doemberger, & Zigler, 1993; Garmezy, 1991), as Masten stated that "the reality is that people differ and for some individuals, different protective factors may be important for specific outcomes in specific context" (Southwick et al., 2014, p. 7). It is likely different people require different combination of factors to actualise their resilience. However, the evidence base is clear that social systems and social support is an important factor in building and maintaining resilience (Haskett et al., 2006; Masten, 1994;Rutter, 1985.

1.6 Social support: Definition and theory

Social support can broadly be defined as involving a range of affirming actions, interpersonal exchanges, and social conditions that are generated from social relationships and consequently contribute to positive mental health and well-being (Gore, 1985; McNicholas & Collis, 2006). More specifically, Gottlieb and Bergen (2010) defined social support as the social resources an individual perceives being available or provided to them either within formal support groups or informal helping relationships. Other research findings suggested that support is moreover a subjective experience that depends on a recipient considering it as quality assistance through adverse events (Antonucci, 1985; Barrera, 1986). Conclusively, the association between social support and well-being has been found consistently, in that perceived social support has been identified as assisting individuals to cope by way of a stress-buffering hypothesis based on empathic understanding, the perceived availability of interpersonal resources during adverse experiences, and an individual's ability

to integrate into a larger social network (Caplan, Killilea, & Abrahams, 1976; Cohen, 1985; Thoits, 1986).

The stress-buffering hypothesis suggested by Cohen and Wills (1985) proposed social support "buffers" an individual from the negative impact of adverse experiences, such that it serves as a protective factor (Cohen & Wills, 1985). An alternative model which Cohen and Wills (1985) found evidence for was the main-effects model, which suggested that social support is beneficial regardless of adverse experiences, although it is possible the main-effects model may require a minimum threshold of social support for benefits to be observed, therefore for individuals with low levels of social support may be denied the benefits of social support. Conclusively, Cohen and Wills (1985) claimed that available, quality social relationships provided stability, positive experiences, positive affect and a sense of self-worth.

However, it is important to note that not all support is positive. Antonucci (1985) explained that when a recipient perceives support efforts negatively or the consequence of the support is negative, such as when a support provider is overprotective, reinforces unhealthy behaviours, non-reciprocal, and/or abusive, can increase the likelihood of negative outcomes and result in maladaptive behaviours. Rook (1984) found that family and friends do not automatically provide supportive relationships and suggested that it is the specific content of relationships that offer value. Recent research found negative social interaction has deleterious effects on physical and mental health outcomes, and in particular, that the negative impact of social strain was more harmful than the positive impact of social support (Ahn, Kim, & Zhang, 2016).

Cohen (2007) suggested social support has a unique role in how individuals interact with others. Results from a conceptual analysis by Langford, Bowsher, Maloney, and Lillis (1997) supported past findings which found four main defining attributes of social support: emotional, instrumental, informational, and appraisal. Emotional support includes empathy, trust, unconditional love, being needed, feeling valued and cared for, with an emphasis on reciprocity (Cobb, 1976; House, 1981; Moss, 1973). Instrumental/tangible support includes the facilitation of practical and tangible products and services as well as financial assistance (Barrera, 1986; House, Kahn, McLeod, & Williams, 1985). Informational support is the provision of verbal communication in the form of advice, mentorship, or practical guidance to aid problem-solving. Appraisal support provides verbal communication to enable self-evaluation, affirmation, and a sense of belonging (House et al., 1985; Wills, 1991). Langford et al. (1997) suggested these four attributes are protective factors for a recipient of social support, as well as allowing for reciprocity to happen in these domains. Subsequently, perceived social support has been linked to emotional well-being and reduced mental health conditions (Barrera, 1986; Cohen & Wills, 1985; Lakey & Cronin, 2008).

1.7 Social support as a mental health construct

Several research findings indicate that social support relationships aid the ability to face challenges, stressors and positively adapt to their environment (Caplan et al., 1976; Haskett et al., 2006; Luthar & Zigler, 1991; Southwick & Charney, 2018). For example, Pejičić, Ristić, and Anđelković (2018) found that perceived social support significantly predicted resilience, and in particular, was shown to be a protective factor for mental health. Furthermore, similar to Langford et al. (1997) findings, Collis and McNicholas (1998) described various components of social support, such as emotional support, esteem support, practical support, as well as providing social integration and opportunities for nurturance and

protection, indicating the intricacies of the construct. Additionally, social support has been shown to protect against loneliness, support one's self-identity and social roles, as well as support functional aspects of relationships (House, Landis, & Umberson, 1988). Finally, Lanford et al. (1997) suggested that consequences of social support include personal competence, perceived control, psychological well-being, coping behaviours, sense of stability, sense of self-worth, and a decrease in mental health conditions.

1.8 Social support during adversity and in building resilience

Several research findings indicate that factors such as close friendships, social support and other environmental factors contribute to resilience (Haskett et al., 2006; Luthar & Zigler, 1991). In fact, Richardson (2002) suggested that exposure to an adverse event results in primary emotions that cause an individual to engage in the resiliency process by seeking out emotional comfort from social supports. Similarly, a review by Wills and Bantum (2012) into what psychological processes resulted in resilience, found that the ability for an individual to self-regulate (e.g. have developed coping skills and self-control abilities) after experiencing a traumatic experience is related to social support and resilience. Therefore, an individual's reaction to adverse life events and their subsequent levels of resilience may be influenced by their levels of social support and close relationships (Harris, 1996; Wills & Bantum, 2012). For example, research suggests that psychosocial factors such as resilience and social support are protective factors against suicidality (Green et al., 2010; Jakupcak et al., 2010). McLean et al. (2008) claimed that isolated and non-help seeking individuals were at risk of suicide and suicidal behaviour, and suggested fostering positive social connectedness, among others, as a prevention strategy.

1.9 Animal companionship and the human animal bond

Recent research found that our relationships with companion animals provided comfort and safety, purposeful routine, a meaningful role, and social connection (Hui Gan, Hill, Yeung, Keesing, & Netto, 2019). Currently, there are approximately 24 million companion animals in Australia, indicating more than two-thirds of Australian homes have a companion animal (Animal Medicine Australia [AMA], 2016). In addition, the companion animal care industry now contributes around $6.02 billion annually to the Australian economy, and expenditure on companion animals and companion animal care products and services increased by 28% between 2006 and 2009 (Australian Companion Animal Council [ACAC], 2010). People spend extraordinary amounts of money, time and energy on their companion animals and the return is evident if companion animals can be a source of physical and psychological support. Although much of the Human Animal Bond (HAB) research has shown that animal companionship may have positive effects on human health and well-being (Beck & Katcher, 1996; Brooks et al., 2018; O'Haire, 2010; Wells, 2009), other research has found no connection between positive mental health and animal companionship, or that the HAB may in fact increase levels of psychological distress (Antonacopoulos & Pychyl, 2010; McNicholas et al., 2005; Parslow, Jorm, Christensen, Rodgers, & Jacomb, 2005; Peacock, Chur-Hansen, & Winefield, 2012; Wells & Rodi, 2000). Research into the putative HAB has grown at a rapid rate in the past 20 years, and as understanding of our relationships with animals continues to develop, examining these interactions and relationships and their potential benefits has become increasingly important (Esposito, McCardle, Maholmes, McCune, & Griffin, 2011; Shapiro & DeMello, 2010).

1.10 Definitions and terminology of the HAB

The term Human-Animal Bond (HAB) was first coined by Konrad Lorenz and Boris Levinson in the 1960s and 1970s in early research that acknowledged the influence of

companion animals on health and wellbeing through the means of social connections such as love and friendship (Hines, 2003). According to Hosey and Melfi (2014) companion animal researchers are more likely to refer to the human-companion animal relationship as a distinct bond. The human-animal bond (HAB) may be viewed as a shared beneficial and dynamic relationship between humans and other animals, and this relationship is influenced by behaviours that contribute to the health and well-being of both (American Veterinary Medical Association [AVMA], 2020). The HAB has been denoted throughout the literature as a complex bond, not unified in its methodology and theory, and further complicated by use of ambiguous terminology (McCardle et al., 2011; Hosey & Melfi, 2014; Esposito et al., 2011). For example, the term 'pet attachment' can be based on "Attachment Theory" developed by Bowlby (1988) or alternatively, based on general attachment within a social relationship (Winchester, 2013). Yet, there have been no definitive outcomes as to whether the human-animal relationship is comparable to human-human relationships (Beck & Madresh, 2008; Crawford, Worsham, & Swinehart, 2006; Peacock et al., 2012; Quinn, 2005). Various terms have been used in the literature to refer to this relationship; here for the sake of consistency we shall refer to it as the human-animal bond (HAB).

There are many human-animal relationships focused on within the literature base, such as animal assisted therapy, animal assisted interaction, service animals, and companion animals. However, the focus here is on the HAB relationship with a companion animal. The term companion animal will be used as opposed to 'pet', as outlined by Walsh (2009) it better connotes the psychological bond and mutuality of the relationship. Furthermore, based on terminology and conceptual definitions within the literature (Esposito et al., 2011; Hosey & Melfi, 2014; Vitztum, 2013), animal companionship is defined as an outcome of community-based individuals living with a companion animal with the intention of providing lifelong

care, and having a mutual relationship with the companion animal based on a series of interactions. Animal companionship is when an individual takes on the responsibility of caring for an animal for the duration of that animal's life, and the animal is kept for the primary use of contributing to an individual's companionship needs (Australian Animal Welfare Strategy [AAWS], 2006).

1.11 The strength of the human animal bond: A theoretical framework

Research investigating the HAB has suggested that individuals establish close emotional bonds with their companion animal. Netting, Wilson, and New (1987) theoretical perspectives of HAB included the role an individual engages in as a companion animal carer, the mutual exchange within the human-animal relationship and experiences throughout the lifespan that influence attitudes towards companion animals, based on theories such as social role theory, exchange theory and life-span development theory, and leading to the amelioration of adversity induced stress. They went on to conceptualise that although the HAB may not fully simulate the human-human bond, it may be possible for non-conventional relationship to occur with companion animals which replace human relationships. Similarly, Russow (2002) proposed a criterion for HAB which involves there being a relationship between a human and animal which is reciprocal and persistent and enhances well-being for both human and animal, and when such criteria are met a bond develops between a human and animal. This distinct bond can be a mutually beneficial relationship which includes emotional and psychological components, however the mechanisms of how the bond works still lack theoretical foundation (Hosey & Melfi, 2014).

Several theoretical underpinnings have been suggested, such as attachment theory, biophilia, systems-oriented theory, and relational ecology framework theory (Beck &

Katcher, 2003; Chur-Hansen, Winefield, & Beckwith, 2009; Putney, 2013; Walsh, 2009). Chur-Hansen et al. (2009) hypothesized the human-animal attachment relationships, based on Bowlby (1973) attachment theory which is borne from object relations theory, may be represented as a curvilinear (inverted U curve) as opposed to a linear relationship (Chur-Hansen et al., 2009). Yet, Putney (2013) contested attachment theory as an underlying mechanism for HAB as being an over-determined and inflexible conceptualization which unnecessarily pathologies individuals. In line with Netting et al. (1987) and Garrity, Stallones, Marx, and Johnson (1989) theoretical conceptualisations, Johnson, Garrity, and Stallones (1992) developed and evaluated a scale to measure emotional attachment of individuals to their companion animals based on weak and strong affection, with theoretical considerations described as the emotional connection in the form of social support that relates to health outcomes (Garrity et al., 1989; Netting et al., 1987; Ory & Goldberg, 1983). Therefore, the theoretical paradigm is based on companion animals providing a supportive relationship in the form of emotional social support and buffering (the HAB), which ameliorates the impact of adverse stressors (McConnell et al., 2011; Garrity et al., 1989; Serpell, 2011), and thus how the HAB impacts on predictors of mental health.

1.12 Animal companionship and mental health

Researching the human-animal relationship, Johnson et al. (1992) determined that although companion animals appear to contribute to psychological health, the relationship between the strength of the bond to companion animals and wellbeing was multifaceted. Proposed psychological health benefits from interacting with companion animals include a decrease in state-anxiety and fear (Shiloh, Sorek†, & Terkel, 2003), decreased feelings of loneliness (Antonacopoulos & Pychyl, 2010), increased levels of self-worth (Wells, 2009), and enhanced social support (Chur-Hansen, Stern, & Winefield, 2010; Wells, 2004). A

qualitative analysis by de Souza (2000) found that companion animal owning individuals with significant mental illness conditions, strongly valued the relationship qualities the HAB offered, such as opportunity to care for another, external focus, companionship, and simple non-complex dynamics, often contrasting to experiences found in other human relationships which often require unconditional love and approval. Furthermore, an investigation by Guéguen and Ciccotti (2008) into trust and attraction in the HAB found that the just the presence of a companion animal encourages helping behaviour, trust and increased compliance within other human relationships. In addition, Wells (2009) highlighted psychological benefits such as enhanced self-esteem and social communication, such as the social role dogs encourage, as well as reduced feelings of isolation and depression. Therefore, research indicated that companion animals have a strong impact on positive mental health and wellbeing, caused by either indirect (such as increasing social interactions that leads to beneficial effects of wellbeing), or direct (such as being a social support that acts as a protective factor for stress and provide confidence for coping skills) effects (McNicholas et al., 2005).

However, some research has found no relationship between mental health and the HAB (Wells & Rodi, 2000). In fact, some research claimed that the HAB may produce increased levels of psychological distress such as depression, loneliness and psychoticism (Antonacopoulos & Pychyl, 2010; McNicholas et al., 2005, Parslow et al., 2005). Additionally, Parslow et al. (2005) found that older Australian adults who owned and cared for a companion animal were more likely to have depressive symptoms and reported higher levels of psychoticism. Reasons for this may include stressors such as caring for companion animals and whether they present with behavioural problems, health issues (of the companion animal or carer) or grieving caused by illness or death of the companion animal (Podberscek,

2006). Additional negative aspects of the companion animal relationship have also been reported in the evidence, such as the negative impact of caregiving responsibilities, financial burden, disruptive or maladaptive behaviour from companion animals, as well as companion animal loss and grieving (Brooks, Rushton, Walker, Lovell, & Rogers, 2016; Ford, 2012; Lowe, Rhodes, Zwiebach, & Chan, 2009). Furthermore, Peacock et al. (2012) found that higher levels of attachment an individual has towards their companion animal resulted in greater psychological distress. Similarly, in Black, Winefield, and Chur-Hansen (2011) study of occupational stress in veterinary nurses, it was determined that higher attachment to individuals' companion animals was more likely to result in decreased job satisfaction. Conclusively, a systematic review conducted by Brooks et al. (2018) found that the HAB mostly provided benefits for those with mental health conditions, such as reducing worry, providing a sense of comfort and self-worth, and encouraging social interaction. However, they also emphasized the complexity of the HAB and stated that these findings were dependent on the research methods (i.e. quantitative versus qualitative studies), as well as varying mediating factors such as pet type, strength of relationship, and quantity of pets.

1.13 Methodological weaknesses in human animal bond research

Research methods within HAB research have been shown to have limitations which may contribute to inconsistent outcomes (Chur-Hansen et al., 2010; Hosey & Melfi, 2014; Peacock et al., 2012). However, recognition of methodological weaknesses has not been a recent realisation, as a lack of scientific rigour was identified early in HAB research with constant recommendation and efforts made to improve reliability and validity of outcomes (Johnson et al., 1992). Therefore, the inconclusive findings within the HAB research may be due to methodological issues, such as the variation in measures developed to investigate the strength of the bond within the companion animal relationship. There are a multitude of

measures assessing the level of comfort or bonding one attains from a companion animal, the level of closeness, commitment or dependence an individual has towards their companion animal, or attitudes, behaviours and level of responsibility an individual exhibit towards their companion animal (Anderson, 2007). Other methodological issues include a lack of longitudinal studies, and often no control groups (Blazina, Boyra & Shen-Miller, 2011; Brooks et al., 2018; Chur-Hansen et al., 2010; Hosey & Melfi, 2014). Where companion animal owners and non-owners have been compared in representative samples, the evidence for mental health outcomes related to the HAB has been negligible (Herzog, 2011; Peacock et al., 2012). Additionally, there are reported issues with "file drawer effect", where there is an over representation of positive results being published by researchers, as well as unconscious biases by researchers who personally favour the HAB (Herzog, 2011).

Similar to Chur-Hansen et al. (2010), Barker and Wolen (2008) propose that much of the research evidence has been descriptive, as well as there being an overuse of convenience sampling within cross-sectional study designs. Furthermore, Sachs-Ericsson, Hansen, and Fitzgerald (2002) suggested that the lack of studies conducted, and the methodological limitations, prevent any solid conclusions. Although research would benefit from randomised controlled trials to provide the best research evidence available, randomised controlled clinical trials are non-existent due to the often-inevitable impossibilities of assigning participants into experimental versus controlled groups, leading to limitations on double-blind control (Chur-Hansen et al., 2010).

1.14 Animal companionship as a social support

Early research indicated there are close emotional bonds between some people and their companion animals, and some individuals give family member status to their companion

animals (Albert & Bulcroft, 1988; Katcher, Friedmann, Goodman, & Goodman, 1983). Similarly, Staats, Wallace, and Anderson (2008) reported various reasons why individuals chose to engage in companion animal guardianship, citing mainly companionship and social support. However, research into animal companionship as a social support has been somewhat tenuous. Endenburg, Hart, and Bouw (1994) suggest that individuals keep companion animals primarily for the social reason of companionship. Yet, according to McNicholas et al. (2005) companionship conceptually differs from social support, as companionship provides intrinsic fulfilment as opposed to extrinsic support and suggests that daily companionship may enhance positive mental health, whereas social support may act as a safeguard to adverse stressors. Regardless, there may be aspects of the HAB that cannot completely substitute human-human relationships, as Serpell (2011) suggested companion animals may fulfil those *social and emotional* needs similar to those fulfilled by human social supports.

To determine if relationships with companion animals (CA) can be compared to relationships with other humans, and if they provide the same requirements to increase mental health and well-being, a review by McNicholas and Collis (2006) found that human-animal interactions can be interpreted as a social interaction, that humans converse with their companion animal as they would another human and use language to describe their companion animal relationship as they would a human relationship. Similar to Vaux (1988), McNicholas and Collis (2006) suggested that social relationships and social interactions conceptually differ; that social interactions are basic processes that contribute to and build social relationships, yet the components of a social relationship can vary from the components of social interactions. While the HAB and human social support constructs may have conceptual similarities, it appears the HAB may substitute unique components of social

support. Meehan, Massavelli, and Pachana (2017) found that individuals perceived their companion animals as a significant form of social support. Whereas Serpell (2011) concluded that companion animals may provide substantive and unique forms of social support that vary in their psychological and physiological impact on owners, suggesting that the *strength* of the relationship may be related to assumed benefits or possible disadvantages of HAB. However, much of the research into HAB and mental health focuses on ownership of, caring for and/or companionship with pets, with little reporting on how the strength of the bond impacts mental health outcomes.

Although there are characteristics of a human-human relationship that are not compatible with the companion animal relationship, such as an inability to seek advice and talk about stressors or anxieties, nor does a companion animal serve as a stronger or more capable figure within the HAB. However, research findings claim that there are characteristics within the companion animal relationship that allow individuals to view their companion animal as providers of love, acceptance and emotional support (Zilcha-Mano, Mikulincer, & Shaver, 2011). Furthermore, Zilcha-Mano et al. claimed that these positive characteristics gained from the companion animal relationship may help an individual cope better and remain more composed during times of adversity. Thus, indicating that positive characteristics within the companion animal relationship can serve to build resilience. Other research suggests that individuals with a companion animal believe that their companion animal provides unconditional acceptance and love, and that the relationship provides stability, constancy, affection, loyalty, genuineness, and with a non-judgmental allegiance (Hirschman, 1994; Levinson, 1969). These components can contribute as positive characteristics offered in social support relationships (Cobb, 1976), and therefore, act as a buffering effect for adverse events and reduces stress responses (Cohen & Willis, 1985).

However, research has found contrasting outcomes between the HAB and social support. Smolkovic, Fajfar, and Mlinaric (2012) investigated whether cat and dog owners with low levels of social support would have higher levels of attachment to pets but did not find a statistically significant relationship. Similarly, Winefield, Black, and Chur-Hansen (2008) study into the relationship between social support and attachment to pets in older adults did not find a statistically significant relationship. It appears much of the research has assumed a linear relationship between perceived human social support and HAB, as well as HAB and related mental health outcomes.

1.15 Animal companionship as a social support during adversity

Given the possibility that animal companions contribute unique supportive characteristics that affect owners (Brooks et al., 2018; Serpell, 2011) and characteristics offered by human social support (Collis & McNicholas, 1998), it is possible those with a very strong HAB could have low human social support, and these constructs have a curvilinear relationship, which may in fact result in compromised levels of resilience due to reduced human social support. Research has shown that adults with a strong bond to their animal companions had fewer human social support networks (Netting et al., 2013; Stallones, Johnson, Garrity, & Marx, 1990). Antonacopoulos and Pychyl (2010) found companion animal owners with low levels of human social support and strong HAB, had increased loneliness and depression, and concluded that the HAB and its relationship with psychological health outcomes was complex. Furthermore, in a sample of HIV infected men, Siegel, Angulo, Detels, Wesch, and Mullen (1999) reported that men who owned a companion animal experienced lower levels of depression, particularly in those with low levels of perceived human social support, and indicated that pets may mediate the relationship between AIDS diagnosis and depression, however the particular strength of the

HAB was not discussed. Much of the research has suggested that individuals with a very strong bond to their animal companions have lower levels of perceived human social support, indicative of a curvilinear relationship, which may result in negative mental health outcomes. Overall, companion animals have been shown to act as a source of companionship, particularly during times of adversity, by way of providing a sense of purpose and reciprocity to those with serious and prolonged mental health conditions (Brooks et al., 2018; Ford, 2012; Zimolag & Krupa, 2010).

1.16 Summary and suggestions for future research

According to Windle (2011), individual assets and protective factors could be enhanced via improved health services and treatments/intervention, with the aim of improving health and well-being for those facing stress, adversity and trauma. Mental health treatment could be improved by acknowledging the role of companion animals in individual's lives, and whether they can encourage engagement in psychological interventions as a valued, positive social support, such that an individual may be able to draw on that supportive relationship when experiencing adversities and related psychopathology. Improving the use of the resources available in the immediate environment (e.g. companion animals as positive social support), may interact by strengthening individual resilience. Given some research has suggested that the HAB contributes positive characteristics offered in social relationships, such as providing unconditional acceptance, love, stability, and with a non-judgmental allegiance (Cobb, 1976; Collis & McNicholas, 1998; Hirschman, 1994; Levinson, 1969). Therefore, it is possible the HAB may provide a buffering effect for adverse events and reduce stress responses (Cohen & Wills, 1985). However, there is currently no research that directly investigates the relationship between resilience, social support and human-companion animal relationships.

Whether the companion animal relationship is equivalent to the role of a close social relationship, which may then result in possible curative or beneficial effects on health outcomes, requires further research (Julius et al., 2013). Furthermore, given the evidence that animal companions contribute unique supportive characteristics that effect owners, it is possible that a very strong HAB could result in, or from, low human social support, and that these constructs have a curvilinear relationship, possibly resulting in compromised levels of resilience due to reduced human social support. Therefore, the possibility of a curvilinear relationship between the companion animal relationship and other variables (Chur-Hansen et al., 2010), such as examining the relationship between HAB and perceived human social support, is an area for future research.

It is clear from research findings that the HAB relationship impact on mental health outcomes is complex and somewhat controversial, yet an important one which requires further research (Herzog, 2011). There are important implications for both individual psychological therapy and understanding the psychological determinants of the HAB. For example, in the delivery of mental health care, therapists might need to consider the role companion animals play when collaboratively engaging with clients and may consider them as a potential protective factor in the form of social support, or possible risk factor as being a burden of care or grief from loss of a companion animal. Therefore, although the HAB has been found to act as a buffering effect for mental health outcomes due to adverse events, the role of resilience as a mental health outcome for HAB has not been explored.

1.17 Research aims and questions

Evidence within the literature review highlights the need for further understanding and exploration into the HAB, human social support and resilience, as well as considering improvements to methodology in research design. Therefore, this thesis aims to explore the following research questions through a series of quantitative and qualitative research studies.

Study One (quantitative research study):

1. What is the difference in levels of resilience between companion animal owners and non-owners?
2. Will the HAB moderate the relationship between perceived human social support and resilience? As such, will a moderately strong HAB will compensate for low levels of perceived human social support?
3. Is there be a curvilinear relationship between the strength of the HAB and perceived human social support? Specifically, will companion animal owners with moderately strong HAB show higher levels of perceived human social support than those with very low or very high HAB?

Study Two (quantitative research study):

4. What are the differences between age groups, marital status, gender, and/or education levels in the HAB, and on human social support?
5. What are the demographic predictors of the HAB when those predictors are interacting with lower levels of human social support?

Study Three (qualitative research study):

6. What are the mechanisms of a strong HAB in women with lower levels of perceived human social support?
7. How does women's companion animal relationship compare to their human relationships?
8. Do women's companion animals impact their ability to cope with adversity?

Chapter 2. Research Methodology

2.1. Preamble

This chapter will outline the research design for the thesis, as well as the methodology for data collection for all three studies contributing to this thesis. An overview of the types of research paradigms chosen to answer the research questions is provided. The methodologies outlined in this chapter expands upon and provides clarity to that encapsulated to meet the limits of a journal-length article. Details are provided for all measures used, as well as information relating to demographic characteristics and reasons for data inclusion and exclusion.

2.2 Research Design of the Thesis

This thesis was formatted as a "Thesis by Publication" and meets the requirements of the guidelines established by the University of Adelaide Graduate Centre[1]. Therefore, within this thesis there are three research manuscripts; one published and two submitted for publishing. Overall, these papers constitute a body of work that explores the relationship between human social support, the human-animal bond (HAB) and resilience, how human social supports compare to the companion animal relationship, and how companion animals' impact on an individual's ability to work through adversity.

2.3 Research Design of the studies: Mixing methods

An overarching aim of this thesis was to engage multiple data-collection methods in an effort to provide credibility and validity to the outcomes, this process is referred to as

[1] https://www.adelaide.edu.au/graduatecentre/current-students/handbook

mixed methods (Hesse-Biber, 2010; Saldaña, 2013). Using a two-phase approach with a follow-up exploratory design (Gelo, Braakmann, & Benetka, 2008), this thesis presents two quantitative studies and one qualitative study and considered three different perspectives: 1) the general population's relationships between human social support, animal companionship and resilience, 2) exploratory analysis of the dataset to determine what subpopulation met the criteria of low to moderate human social support and strong HAB, and consequently more likely at risk of lower resilience, and 3) exploring that subpopulation more in-depth to understand how their human and companion animal relationships compare and whether and how their companion animal impacted upon their ability to process adversity. Each sequential study provided additional context for the following study, and specifically used quantitative methods to collect data and generate a targeted sample for more comprehensive qualitative interviews. Therefore, the data collected from qualitative methods builds upon the outcomes from the quantitative studies in an explanatory sequential design that allows the subpopulation of interest to be understood more holistically (Del Toro & Yoshikawa, 2016; Wisdom & Creswell, 2013). Frequently, limitations to each individual method are reported, such as quantitative research being deductive and too objective and qualitative research being more interpretive and less generalisable (Allwood & Allwood, 2012; Gelo et al., 2008), whereas such limitations may be mitigated by incorporating mixed methods and accounting for each method's weaknesses with the strengths of the other (Gelo et al., 2008; Turner, Cardinal, & Burton, 2017).

In regard to furthering the field of research methodology, Allwood (2011) argued against the distinct division of quantitative and qualitative research, stating it was of limited value and simplistic as there is overlap and to distinguish the research methods, philosophies, and processes does not encourage furthering the field. However, Gelo et al. (2008) suggested

the two methodologies are strongly distinct from one another and that combining these methods constitutes a new paradigm in itself, and should be a requirement for studying the contextual and causal complexities of the social world. The current research project has sought to use a combination of research methods that allow for best practice in answering the research questions associated with each individual study and being able to link those fluidly for the project as a whole. There is a limited amount of mixed methodology undertaken in the field of HAB and by adopting a combination of research designs may advance and integrate the outcomes within the field.

Overall, mixed methods research aims to link data gotten from different methods and not neglect data integration (Fielding, 2012) For example, finding a representative subsample of the population through conducting a quantitative demographic survey enables more in-depth qualitative research, with both studies becoming directly linked (Hesse-Biber, 2010). Furthermore, qualitative research can complete information found in quantitative research by expanding on concepts that are not easily explored within quantitative methodology. Nevertheless, as with all methodologies there are common barriers to mixed methods design, including the ability to publish large mixed methods studies with rich qualitative findings, as well as reducing participant burden with lengthy surveys (Yoshikawa, Weisner, Kalil, & Way, 2008). Hence, due to the volume of descriptive data produced by the qualitative study and to encourage participation in the survey with a short easy-to-complete questionnaire and not increase attrition, this PhD project produced separate studies to explore all the relevant research questions.

2.3.1 The Quantitative Research: Study One and Two

Quantitative research is a 'top down' process that focuses mainly on the use of numbers as data that identify the relationships between variables and examines correlations, explanations, or prediction through a deductive process (Fallon, 2016; Field, 2013). The objective process of quantitative research involves the collection of relevant data and then the conduct of statistical analysis to generate or modify theories based on the hypotheses set (Chur-Hansen et al., 2009). Quantitative research was chosen for Study One and Two investigating the relationship between variables within a large population, such as whether the HAB variable moderated the relationship between human social support and resilience (a gap identified in the literature), what demographic variables best explained the HAB and human social support variables, and what demographic variables predicted the HAB when interacting with human social support. Study Two was considered phase one of the two-phase approach with follow-up exploratory design method.

2.3.2 The Qualitative Research: Study Three

The purpose of qualitative research is to decipher patterns and construct meaning from language as a rich data source (Braun & Clarke, 2013; Saldaña, 2013). A qualitative approach was considered appropriate to complement the quantitative findings and to contextually understand the relationship women who had low to moderate levels of human social support had with their companion animals and understanding how these relationships compared. Specifically, the purpose of using a qualitative research framework within this body of work was to have a more in-depth understanding of the characteristics of the relationship between women and their companion animals, and what components of social support, such as informational, practical, emotional, or appraisal (Langford et al., 1997) were provided by and valued from their companion animal. Study Three was considered phase two of the two-phase approach with follow-up exploratory design method.

2.4 Outline of the research

The aims of Study one was to examine the relationship between human social support, the HAB and resilience, to determine whether the HAB would moderate the relationship between human social support and resilience, and investigate a possible curvilinear (i.e. an inverted U shape) relationship between human social support and the HAB. The aim of Study Two was to explore and expand on the outcomes of Study One that there was a curvilinear relationship between human social support and the HAB, and determine what demographic characteristics of companion animal owners comprised the subpopulation in one the quadrants, namely low to moderate levels of human social support and strong levels of the HAB. The data collected in Study One provided the data for Study Two, however only the variables of interest were utilized for Study Two. The aim of Study Three was to further investigate the subpopulation found within Study Two, women who met the criteria for low to moderate human social support and strong HAB and determine how human social supports compared to companion animal relationships, and how their relationship with their companion animals impacted their ability to process through adverse experiences. Overall, the data collected in Study one provided data for two research papers, as well as providing access to the sample for Study Three.

2.5 Study One and Two – Quantitative Research

The first and second studies within this thesis share a methodology and conducted analyses from the same large dataset. However, each study addresses different research aims. The variables used to answer the research questions for each individual study were used in either one or both studies. This section presents the methodology used to collect data for Study One and Two, as well as the procedure used.

2.5.1 Ethics

Ethics for conducting Study One and Two were provided by the School of Psychology: Human Research Ethics Subcommittee at the University of Adelaide (Code Number: 17/09). Ethics for Study Two was considered to meet the test for Waiver of Consent due to exploration of the same dataset.

2.5.2 Pilot Study for Study One

A brief pilot study was conducted to determine the readability and understanding of the questionnaire, as well as the timeframe of questionnaire completion. To identify any potential issues with the standardised measures chosen to assess the constructs being investigated, participants were randomly chosen from the researcher's peers, colleagues, and personal contacts based on the speed of their response and interest to take part. Participants were presented with a link to the online questionnaire and asked to complete it. Once completed, participants were then asked to identify any understanding and/or design issues. Minor grammar, spelling and/or formatting issues were identified and amended. An assessment of readability was conducted using the Flesch-Kincaid Reading Ease Test[2] (Flesch, 1948) to determine whether the survey was easily understood by adults 18 year and over. The Flesch-Kincaid Reading Ease score was 73.5, which means the text should be easily understood by 11- to 12-year-olds, and therefore considered sufficient for adults over 18 years.

2.5.3 Recruitment

[2] Assessed through website: https://www.webfx.com/tools/read-able/

The study was promoted using online snowball sampling via social media website 'Facebook', and flyers distributed on the university campus and delivered in a mailbox drop in metropolitan Adelaide, South Australia (see Appendix A). The study was advertised via flyer distribution to capture participants who may not have a social media presence. In addition, specific target groups, such as rotary clubs, football clubs, and baseball and softball clubs, were contacted via email (see Appendix B) in an effort to recruit a representative sample, in particular participants (i.e. older adults and young males) that may not have been captured within the social media recruitment drive or who were less likely to complete research surveys. Baltar and Brunet (2012) advocated the use of new technologies, such as social media 'Facebook', in an effort to engage hard-to-reach populations and found the virtual response rate through this method of data collection was higher than that of traditional snowball techniques. The social media format for recruitment was deemed appropriate in an effort to recruit a varied age range of participants and in particular those aged eighteen to forty-five years old, a population less likely to be encapsulated within research studies in the HAB field of research. The study promotion and link appeared in the 'newsfeed' of all online 'friends' of the PhD candidate, together with a request to 'share' the link and subsequently snowball the recruitment process. All forms of recruitment prompted participants to consider whether the strength of social connections helped them bounce back from adversity. A link to the online survey (see Appendix C) was also provided.

2.5.4 Inclusion and Exclusion Criteria

Participants were chosen based on their voluntary consent. Participants who either own a companion animal or do not own a companion animal were sought, however companion animal owners were required to have ownership of their companion animal and not be a service animal or animal accessed in therapy. Participants were excluded if living in

an institution (i.e. nursing home, prison, hospital), and if under 18 years old. This information was determined through a series of drop-down boxes that recorded age and type of residence; if participants chose drop-down option "17 or younger" they were excluded, and if they chose "Residential care facility" or "Other institution (e.g. hospital, prison)" they were also excluded. Furthermore, participants were required to be residing in Australia at the time of completing the survey, as outlined in the Information Sheet (see Appendix D). The study was only created in English and not designed in multiple languages, so participants were also required to be proficient in Grade 6: Aged 11 to 12 years reading level, as per Flesch-Kincaid Reading Ease Test (Flesch, 1948; as outlined above), to read the Information Sheet and survey questions. Given the survey was hosted online, participants were also required to have access to a computer or mobile phone with online access. Online survey platform Survey Monkey (www.surveymonkey.com) was considered mobile phone compatible and the survey was able to be accessed from opening the link while on a mobile phone.

2.5.5 Materials

The survey was constructed using three standardised and validated scales that measured perceived human social support, psychological resilience, and the strength of the human-animal bond. The survey also comprised of series of demographic characteristic questions. Finally, participants were asked if they wanted to participate in further research at the end of the online survey. It was completely voluntary for them to leave their contact details (i.e. email address, telephone number) to potentially be contacted for follow up interviews to expand on the outcomes of the current research. A description of the measures is outlined below.

2.5.5.1 Demographic characteristics

Participants' gender, age, type of residence lived in, level of education, relationship status, and number of people in household were collected to assess demographic information. For Study 2, level of education was originally measured in seven categories based on that of the Australian Bureau of Statistics (ABS, 2017; 1 = Did not complete high school; 2 = Senior secondary certificate of education (completion of high school); 3 = Graduate certificate(s) or diploma; 4 = Bachelor's degree; 5 = Graduate diploma or bachelor honours degree; 6 = Master's degree; 7 = Doctoral degree). For ease of statistical analysis and interpretation of results, these categories were collapsed into three categories (1 = High school or less; 2 = Undergraduate degree; 3 = Postgraduate degree). Similarly, data collected for current relationship status was originally measured in six categories (1 = Married; 2 = Widowed; 3 = Divorced; 4 = Separated; 5 = In a domestic partnership/de facto/or civil union; 6 = Single, never married). These six categories were then collapsed into two (1 = Married/partner; 2 = Single). Lastly, age was also collapsed into two categories (1 = 0-39 years; 2 = 40 years and over), from the original fourteen categories use within the survey. Type of residence lived in consisted of six categories (1 = House with a garden; 2 = House without a garden; 3 = A unit or apartment with a garden; 4 = A unit or apartment without a garden; 5 = Residential care facility; 6 = Other institution [e.g. hospital or prison]).

Additional questions included whether participants had a companion animal or not, and if so, what type of companion animal they currently had, a range of options included: 1 = Dog; 2 = Cat; 3 = Rabbit; 4 = Bird; 5 = Horse; 6 = Fish or reptile; 7 = Other. The standardised measures used in the survey are outlined below.

2.5.5.2 Strength of bond with companion animal

Lexington Attachment to Pets Scale (*LAPS;* Johnson et al., 1992)

The LAPS is a 23 item self-report measure of an individual's emotional bond with their companion animal. The test included statements such as 'Quite often I confide in my pet' and 'I love my pet because it never judges me'. Responses were made on 5-point Likert Scale as to how much an individual agreed or disagreed with the listed statements (ranging from 0 = Don't know/refuse to 4 = Agree Strongly). The possible range of scores was from 0 to 92. Scores ranged from 30 to 90 and were calculated by reverse scoring items 8 and 21, and then summing all responses, with higher scores being indicative of higher levels of HAB. The scale demonstrates acceptable internal consistency (Cronbach's alpha = .90).

The LAPS measure was made available in Anderson's (2007) *Assessing the human-animal bond: A compendium of actual measures*. The LAPS was chosen because has been considered the most widely used measure of humans' emotional connection to their companion animals (Ramírez, Quezada Berumen, & Hernández, 2014). This measure was also chosen based on it measuring the strength of the emotional bond an individual had with their companion animal and not 'attachment' as mapped onto Bowlby (1988) attachment theory, which is another theoretical perspective of the HAB entirely (Johnson et al., 1992).

2.5.5.3 Human Social Support

Multidimensional Scale of Perceived Social Support (*MSPSS;* Zimet, Dahlem, & Farley, 1988)

The nature of human social support was measured using the MSPSS. The MSPSS is a 12 item self-report measure of perceived social support from three sources: family, friends, and a significant other. Participants were asked to rate how they felt about statements such as "There is a special person who is around when I am in need", "My family really tries to help me", and "I can count on my friends when things go wrong", with no specific time frame

given. Responses are made on a 7-point Likert Scale (ranging from 1 = Very strongly disagree; 4 = Neutral; and 7 = Very strongly agree). The possible range of scores was from 1 to 7. Within Study One and Two scores ranged from 2 to 7 and were calculated by summing the scores to each response and dividing by 12, with a higher score reflecting higher perceived social support. The scale demonstrated suitable internal consistency (Cronbach's alpha = .93). The three subscales of 'significant other', 'family', and 'friends' were not utilised, and corresponding mean scale scores were not calculated, as an overall total mean scale score of perceived human social support was considered appropriate for these studies.

There were no established population norms for the MSPSS due to the variability of race, culture, age and gender. Therefore, the authors considered how human social support differed between demographic groups and its association with other measures to provide direction for categorising the sample (Zimet et al., 1988). Therefore, to divide the participants into groups based on their scores and using the scale response descriptors as a guide, three categories were created. Scores ranging from; 1 to 2.9 were considered low support, 3 to 5 were considered moderate support, and 5.1 to 7 were considered high support. The authors considered this method of categorising groups as the most valid (Zimet et al., 1988). For Study Two, the three categories were further collapsed due to there being only three participants in the low social support category. Therefore, low social support and moderate social support were combined into a new category: low to moderate social support (score ranging from 1 to 5).

This scale was chosen due to its strong psychometric properties and being considered a standardised, validated measure. The MSPSS has demonstrated very good internal consistency and test-retest reliability (Clara, Cox, Enns, Murray, & Torgrudc, 2003; Zimet,

Powell, Farley, Werkman, & Berkoff, 1990). Furthermore, the scale was freely accessible to the general public and considered one of the most widely used and translated measures used to assess human social support (Dambi et al., 2018).

2.5.5.4 Resilience

The Connor-Davidson Resilience Scale 25 (CD-RISC-25; Connor & Davidson, 2003)

Resilience was measured using the CD-RISC-25, which is a 25 item self-report scale of stress-coping ability when faced with adversity. Items included in the scale included statements such as "I am able to adapt when changes occur", "I can deal with whatever comes my way", and "Under pressure, I stay focused and think clearly". Participants were required to make responses on a 5-point Likert Scale as to how much an individual agrees that a given statement applied to them over the past month (0 = Not true at all to 4 = true nearly all of the time). The possible range of scores could be from 0 to 100. Within Study 1 scores ranged from 17 to 75 and were calculated by totalling all responses. A higher score reflected greater resilience. The scale demonstrates satisfactory internal consistency (Cronbach's alpha = .93).

This scale was made available by the researchers after contacting them, completing a required consent form and providing payment. The scale was mainly chosen because of its wide use and strong psychometric properties. Due to copyright, further information about the scale and terms of use can be found at www.cd-risc.com.

2.5.6 Procedure

A link to the survey was made available to the participants, along with a brief instruction sheet on how to access and complete the survey (see Appendix B and D). The

survey was hosted by Survey Monkey website (www.surveymonkey.com). The survey consisted of 85 questions (see Appendix C) following the information sheet and consent page (see Appendix E). The information sheet outlined the background and benefits of the study, the reason for seeking participation, assured the anonymity of the individual's responses, the low-risk nature of the research, and their ability to withdraw from the study at any time. Only participants who click on the icon to acknowledge their consent were permitted to progress through the survey. Participation was voluntary and participants were able to withdraw from the survey at any time by closing down the webpage. The online survey would have been completed on a single occasion in the participants' own time. There was no interaction between the researcher and the participants while completing the survey, however the researcher was available to contact if necessary, such as with any queries, potential language barriers, problems or questions, and to ensure confidentiality of responses. The entire questionnaire would have taken participants approximately 10-15 minutes to complete. All data collected from the studies has been saved on a university password protected computer for seven years, thereafter it will be destroyed.

2.5.7 Data Analysis

2.5.7.1 Study One

Data were compiled and analysed using SPSS Version 24.0 (IBM, 2016). Descriptive statistics were conducted: frequency and percentage for categorical variables, mean and standard deviation for normally distributed continuous variables and median and interquartile range for non-normally distributed continuous variables. Scale reliability was assessed for each scale variable using Cronbach's alpha. Hypothesis one was investigated using independent samples t-test to determine any difference in levels of resilience (CD-RISC)

between pet owners and non-pet owners. Hypothesis two was examined using a Pearson's product-moment correlation coefficient to determine the strength and direction of the linear relationship between levels of perceived human social support (MSPSS) and resilience (CD-RISC). The coefficient of determination was then calculated by squaring the *r* value and multiplying by 100 to convert to a percentage of the variance shared between both variables (Pallant, 2016). Hypothesis three was examined using a linear regression model with interaction term to investigate whether the strength of the HAB (LAPS) moderated the relationship between social support and resilience. Finally, hypothesis four was investigated by visual inspection of the scatterplot of the strength of the HAB (x-axis) and perceived human social support (y-axis). A line of best fit was added to the scatterplot to determine the direction of the relationship between the variables. Further analysis was undertaken using a linear regression model with quadratic term to determine if a statistically significant non-linear (i.e. curvilinear) relationship existed between the variables and determine the direction of this relationship (i.e. U-curve or inverted U-curve).

2.5.7.2 Study Two

Data were compiled and analysed using SPSS Version 24.0 (IBM, 2016). Scale reliability was assessed for each scale variable using Cronbach's alpha. Descriptive statistics were conducted for the on the outcome variables, perceived human social support (MSPSS) and human animal bond (LAPS), and demographic variables (sex, age, education, and marital status). T-tests were conducted to determine the differences between mean scores for the demographic variable groups (sex = male/female, age = 18-39 years/40+ years, and marital status = single/married or in domestic partnership) on the outcome variables (MSPSS and LAPS). A one-way ANOVA test was conducted to determine the difference between levels of education (high school and below/undergraduate degree/postgraduate degree) and the

outcome variables. Eta squared was manually calculated and used as an estimate of effect size (Pallant, 2016). Generalised Linear Models (GLM) was used to examine the association and interaction effect between the demographic independent variables and perceived human social support with outcome variable, human-animal bond. Individual models were run for each independent variable (sex, age, marital status, and education) to test for the interaction effect with perceived human social support on the HAB. Finally, for those models that indicated statistically significant interaction effects, a post-hoc pairwise comparison analysis was conducted.

2.6 Study Three – Qualitative Research

Study Three utilised a qualitative design, specifically individual, face-to-face or telephone, semi-structured interviews to explore women's experiences with their relationship with their companion animal and how that compared to their human-human relationships, as well as investigate what impact their companion animal had on their ability to work through adverse experiences. Despite expanding on findings from Study Two as phase-two of the two-phase approach with follow-up exploratory design, this study explored a sample of women, as opposed to single women, due to accessibility of a sample from the participants from Study One who expressed interested in participating in future research. The number of participants who were single women would not accommodate a large enough sample to explore the research questions with qualitative methods and reach data saturation. Therefore, a sample of women were chosen who were either married or single as overall, women were still considered to have lower levels of human social support and stronger HAB.

2.6.1 Ethics

Ethics for conducting Study Three was provided by the School of Psychology: Human Research Ethics Subcommittee at the University of Adelaide (Code Number: 17/83).

2.6.2 Procedure

Participants were emailed an Information Sheet (see Appendix F) and Consent Form (see Appendix G) that outlined the nature, purpose, any associated risks and benefits of participating. Participants could read the study information in their own time and were able to contact the researcher for more information or to ask questions prior to consenting to the research. This information was also presented verbally at the beginning of each interview once the participant had consented to participate. Participants were informed in the Consent Form that the study had been explained to them, may not benefit them, assured confidentiality of their responses, that they were free to withdraw from the study at any time, and that their responses would be audio recorded. However, it was not anticipated that the interviews would cause any distress or trauma. None of the participants appeared distressed throughout the interview process, however they were provided an extensive list of supportive counselling options as a contingency plan if they were to experience discomfort. If participants agreed to partaking in an interview, they were asked to return the signed consent form via email (if living interstate) or alternatively, bring it to the face-to-face interview. Participants were also asked to provide verbal consent prior to the interview starting. Furthermore, the purpose of the data collection, the nature of the PhD thesis and possible publication were all discussed with the participants prior to the interview taking place.

In regard to ethical consideration and confidentiality, given the nature of qualitative interviews and the disclosure of personal information, there is risk of anonymity being breached due to the limited numbers within the study. There is risk the interview transcript

could contain information that would make the participant identifiable. This was taken into consideration and pseudonyms were allocated to each participant, their companion animal, and any other information deemed identifiable by the researcher (i.e. place of residence, employment, names of friends/family).

Semi-structured interviews were conducted either via telephone or face-to-face in Adelaide and digitally audio-recorded for the purpose of transcription. Each interview began with an introduction to the study's purpose and an agenda was set for the interview. Participants were asked a series of 9 open-ended questions investigating their relationship with their companion animal in comparison to family and friends, such as "How does your relationship with your pet compare to other relationships you have with your family and/or friends?" and were asked to reflect on a specific time of adversity and whether and how their pet impacted their ability to process such challenges. Participants were encouraged to answer candidly and openly, with follow up questions and prompts used to ascertain more detail, such as "Can you provide an example?" (see Appendix H for a complete list of interview questions). Following the semi-structured interview questions participants were asked, "Is there anything else you would like to add?". Interviews lasted approximately 20-30 minutes and were transcribed verbatim by the researcher. Participants were provided a copy of the transcript for review and given an opportunity to clarify any information they had reported and/or whether they wanted to add any additional responses. They were also provided a written draft of the analysis for their review and a request for comments on the authenticity of the researchers' interpretations. This was considered protocol in the analysis as part of member checking (Braun & Clarke, 2013). The aim of member checking was to ensure the participants' views and experiences were accurately interpreted and represented, while still allowing for the researchers' interpretative analysis. There were no amendments to the data

or outcomes based on the member checking process. As the previous studies, the data from the studies has been stored on a university password protected computer for seven years, then it will be destroyed.

2.6.3 Qualitative Analysis

Data comprised of the transcribed interviews with each participant. An inductive thematic analysis approach was taken, the data was coded based on content related to the research question, these codes were then grouped into themes based on recurrent patterns (Braun & Clarke, 2013). An inductive approach uses disciplinary knowledge and epistemology to generate themes from the data, and not existing theory alone. A process of "complete coding" was conducted, where all information within the whole dataset that was considered relevant to the research question, was identified and studied (Braun & Clarke, 2013). Several rounds of coding were undertaken before a complete analysis was finalised in an effort to allow for meaningful coherence, as recommended within the qualitative research literature (Saldaña, 2013; Tracy, 2010). Themes were identified semantically, which took into consideration the participants' descriptions and experiences. The PhD candidate and an experienced researcher analysed the data and determined consistency in themes and consensus was established via discussion. No further interviews were conducted when it was clear that there was saturation of the data themes. Finally, the PhD candidate also kept an audit trail throughout the research process, as recommended by Tracy (2010). All potential influences on the data source that could affect decision making when formulating themes were documented, such as conversational content had with participants, notes made during the interview and when prompts were provided, as well as observations made on reflection after the interview took place.

2.6.4 Reflexivity

Reflexivity is the ability to critically reflect on the research process and the role the researcher (in this case the PhD candidate) had in the decisions made (Braun & Clarke, 2013; Burns, Fenwick, Schmied, & Sheehan, 2012). For example, researchers have 'insider' and outsider' positions as part of their role as researcher, in this instance I had multiple insider roles as a woman and a companion animal owner and therefore shared this identity with the participants. As qualitative research is valued as a subjective process (Braun & Clarke, 2013), my personal, professional, and researcher identity is likely to bring my own values, assumptions, and beliefs to the research and will subsequently be reflected in the research findings, as well as each participant's subjective experiences are. To ensure good quality qualitative research, engaging in a personal reflexive process and determining what were my own personal circumstances brought into the research were an essential requirement (Braun & Clarke, 2013). Both personal and professional experiences have influenced my decision to undertake research within this area, as well as possibly prejudicing the knowledge gathered throughout this study.

My interest in the area of the HAB and the emotional support they can provide comes from my own personal experiences of owning a cat for twelve years (her lifespan) and experiencing comfort from her during adverse experiences. I acquired her while living overseas and became unwell with a chronic illness. My relationship with her offered a sense of comfort during this time, but also provided a sense of purpose by having to physically care for her which generated an external focus rather than an internal rumination of the adverse circumstances at the time. My cat then accompanied me in an international relocation and the adjustment period that accompanied that. Such experiences created a particular interest in the

outcomes of the qualitative study as I had a strong insider role and assumptions about the service a companion animal could provide.

In addition, I was practising as a provisional psychologist and then a fully registered psychologist throughout this research project. As a psychologist I had a particular interest in people's experiences with adversity and their potential risk and protective factors. As part of my clinical training and practice, it was apparent to me that there was no formal education about the relationship individuals had with their companion animals, specifically when conducting a risk assessment for self-harm and suicide, although there was considered emphasis on the importance of human social supports. This led me to question whether mental health professionals held the assumptions that all companion animals were beneficial, in line with much of the anecdotal evidence, or whether it did not occur to them to enquire as not everyone has a companion animal and if one did, the companion animal relationship would possibly not have the capacity to impact on risk of harm.

As the first author (a female, Caucasian, cat owner) I conducted the interviews and data analysis for the study. However, I kept a reflexive research journal throughout the research process to avoid and/or reduce the influence of potential biases on the results (Braun & Clark, 2006; Tracy, 2010). My values, assumptions, perspectives, and politics were critically reflected upon and whether these could have influenced the collection and analysis of data, and related outcomes (Finlay & Gough, 2003). On reflection, I felt my experience as a companion animal owner and psychologist allowed me build rapport with the participants and I was aware of how my own experiences within my human-companion animal relationship may influence my interpretation of the data. However, I was careful not to disclose or draw upon my own experiences in the interviews or the interpretation of results.

As a researcher, I carefully operationalised the study to include the reflexive process, to minimise the impact and acknowledged the contributions I have made to the outcomes and interpretation of the findings.

2.7 Summary

This chapter has outlined a detailed methodological overview of the three studies conducted within this research project. A summary is provided of why quantitative and qualitative research studies were undertaken and a discussion about using a mixed methods research design may better support the investigation and outcomes to research problems (Busetto, Wick, & Gumbinger, 2020). Furthermore, this chapter provides the scope of the reflexivity that was undertaken as part of the qualitative research process.

Chapter 3. Are stronger bonds better? Examining the relationship between the human-animal bond and human social support, and its impact on resilience

3.1 Statement of Contribution

Statement of Authorship

Title of Paper	Are stronger bonds better? Examining the relationship between the human-animal bond and human social support, and its impact on resilience
Publication Status	☑ **Published** ☐ Accepted for Publication ☐ Submitted for Publication ☐ Unpublished and Unsubmitted work written in manuscript style
Publication Details	Hill, L., Winefield, H., & Bennett, P. (2020). Are stronger bonds better? Examining the relationship between the human-animal bond and human social support, and its impact on resilience. *Australian Psychologist, 55*(6), 729-738. doi:10.1111/ap.12466

Principal Author

Name of Principal Author (Candidate)	Lian Hill		
Contribution to the Paper	Conducted the literature review, developed the aims, designed the study, collected and analysed the data, wrote the manuscript and acted as the principal corresponding author, as well as made revisions to the manuscript during the peer-review process as part of submission, in consultation with the co-authors.		
Overall percentage (%)	80%		
Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper.		
Signature		Date	09.02.2021

Co-Author Contributions

By signing the Statement of Authorship, each author certifies that:

i. the candidate's stated contribution to the publication is accurate (as detailed above);

ii. permission is granted for the candidate in include the publication in the thesis; and

iii. the sum of all co-author contributions is equal to 100% less the candidate's stated contribution.

Name of Co-Author	Helen Winefield		
Contribution to the Paper	Provide guidance and supervision during the planning, collection and analysis of the data, advised on the preparation and format of the report for publication as a journal article, reviewed and edited drafts of the paper, guided the first author's responses to referee requests for revisions. (10% contribution)		
Signature		Date	07.02.2021

Name of Co-Author	Pauleen Bennett		
Contribution to the Paper	Provide guidance and supervision during the planning, reviewed and edited drafts of the paper, guided the first author's responses to referee requests for revisions. (5% contribution)		
Signature		Date	09.02.2021

Please cut and paste additional co-author panels here as required.

3.2 Paper

3.2.1 Abstract

Objective: The Human-Animal Bond (HAB) has been shown to provide a buffering effect for stress and adversity, particularly when individuals experience lower social support networks. This study aimed to explore the relationship between the HAB, perceived human social support and resilience by assessing whether the HAB could moderate the impact of social support as a protective factor for resilience. Additionally, whether the relationship between the HAB and human social support may be curvilinear was explored.

Method: A cross-sectional study of a large community sample of pet owners (n = 392) and non-owners (n = 146) provided information about their human social supports and resilience, and the strength of pet owners emotional bond to their companion animal.

Results: There was no difference in levels of resilience between pet owners and non-owners, but social support was positively associated with resilience for both. The HAB was not a significant moderator between levels of social support and resilience for owners. However, there was a significant curvilinear relationship between the HAB and perceived human social support.

Conclusion: The lack of evidence for HAB being a buffer between perceived human social support and resilience may partly be due to the curvilinear relationship between the strength of the HAB and perceived human social support. Extremely weak or strong HABs may be correlated with a reduced capacity to build resilience and process adversity. Therefore, this study highlights the complexities of the HAB and its relationship with human mental health, offering alternative considerations for future research.

Key words: animal companions, human-animal bond, mental health, pets, resilience, social support

3.2.2 Introduction

The occurrence of stress and adversity in everyday life is a reality, as is some probability of exposure to more significant traumatic events. Stress, adversity and trauma impact on mental health and can result in various psychopathologies (Bonnano, 2012; Höltge et al., 2018; Southwick, et al., 2014). Approximately 45% (7.3 million) of Australians aged 16-85 years will experience a mental health condition in their lifetime which contributes to 12% of Australia's disease burden (Australian Institute of Health and Welfare [AIHW], 2018). Therefore, there is a growing need for the enhancement of individual strengths that aid in buffering against mental health decline, namely resilience. Resilience is not solely the absence of psychopathology but a dynamic process that enables an individual to effectively negotiate, adapt to and/or manage sources of stress, adversity or trauma over the lifespan (Windle, 2011). One of many protective factors that contribute to individual resilience is perceived social support (Haskett et al., 2006; Masten, 1994; Rutter, 1985). The human-animal bond (HAB) has been found to contribute positive characteristics offered in social support relationships, such as unconditional acceptance, love, stability, and a non-judgmental allegiance (Cobb, 1976; Collis & McNicholas, 1998; Hirschman, 1994; Levinson, 1969). Therefore, it is possible the HAB may provide a buffering effect for adverse events and reduce stress responses as a form of social support (Cohen & Wills, 1985). However, there is currently no research that directly investigates the relationship between resilience, social support and human-companion animal relationships.

Currently, there are approximately 24 million companion animals in Australia with more than two-thirds of Australian homes having a companion animal (Animal Medicine Australia [AMA], 2016). Therefore, understanding the impact of the HAB is potentially of significant value. Much of the HAB research has shown that animal companionship may have positive effects on human health and well-being (Brooks et al., 2018; O'Haire, 2010). Yet, other research has found no connection between positive mental health and animal companionship, or that the HAB may be associated with increased levels of psychological distress (Antonacopoulos & Pychyl, 2010; McNicholas et al., 2005; Peacock et al., 2012). The inconsistent findings are often related to methodological weaknesses which include a lack of longitudinal studies, variation in standardized measures, often no control groups, convenience sampling, and file drawer effect (Brooks et al., 2018; Chur-Hansen et al., 2010; Herzog, 2011; Purewal et al., 2017). Additionally, the HAB has been denoted throughout the literature as a complex bond with research not unified in its theory and further complicated by use of ambiguous terminology (McCardle et al., 2011; Hosey & Melfi, 2014; Esposito et al., 2011). Therefore, based on terminology and conceptual definitions within the literature (Esposito et al., 2011; Hosey & Melfi, 2014;Vitztum, 2013), this paper defines animal companionship as an outcome of community-based individuals living with a companion animal with the intention of providing lifelong care and having a relationship based on a series of interactions. The theoretical paradigm is based on animal companions providing a supportive relationship in the form of emotional social support and buffering which ameliorates the impact of adverse stressors on mental health (Garrity et al., 1989; McConnell, Brown, Shoda, Stayton, & Martin, 2011; Serpell, 2011).

Social support in human-human relationships has been shown to contribute to positive mental health and wellbeing, and is broadly defined as involving a range of affirming actions,

interpersonal exchanges, and social conditions that are generated from social relationships (Gore, 1985; McNicholas & Collis, 2006; Teismann et al., 2018). Collis and McNicholas (1998) described various components of social support, such as emotional support, esteem support, practical support, as well as providing social integration and opportunities for nurturance and protection. Several research findings indicated that social support aids individuals in adapting to challenges and difficulties within their environment (Caplan, Killilea & Abrahams, 1976; Haskett et al., 2006; Luthar & Zigler, 1991; Southwick et al., 2018). For example, Pejičić et al. (2018) found that perceived social support significantly predicted resilience, and in particular was shown to be a protective factor for mental health. It may be that companion animals provide some of the aspects offered by human-human social support, such as being social surrogates and enhancing social affect regulation (Brown & Coan, 2016), as they are often perceived as a source of emotional support by their owners (Meehan et al., 2017). Serpell (2011) suggested companion animals may fulfill those *social and emotional* needs similar to those fulfilled by human social supports, and it is the *strength* of the relationship that may be related to possible benefits or disadvantages of HAB. The HAB and human social support constructs may have conceptual similarities, yet the HAB may provide substantive and unique forms of social support that vary in their psychological and physiological impact on owners.

Companion animals have been shown to support individuals living with chronic pain by providing emotional and social support, and a sense of purpose (Bradley & Bennett, 2015). Likewise, Brooks et al. (2016) found companion animals are an important source of support for individuals managing long-term mental health problems, particularly when other support networks were limited or difficult. Similarly, Antonacopoulos and Pychyl (2010) found pet owners with low levels of human social support and strong HAB had increased

loneliness and depression, and concluded that the HAB and its relationship with psychological health outcomes was complex. Finally, engagement with a companion animal rather than the sole presence of a companion animal was related to lower levels of depression in older adults (Cheung & Kam, 2018). However, much of the research into HAB and mental health focuses on ownership of, caring for, and/or companionship with pets, with little reporting on how the *strength* of the bond impacts mental health outcomes. Given the possibility that animal companions contribute unique supportive characteristics that affect owners' mental health (Brooks et al., 2018; Serpell, 2011), it is possible that the strength of the HAB relationship could moderate the levels of resilience in those with either low or unsatisfactory perceived social support. Alternatively, these constructs may have a curvilinear relationship which could result in compromised resilience due to reduced human social support. Although the HAB has been found to act as a buffering effect for mental health outcomes due to adverse events, the role of resilience as a mental health outcome for HAB has not been explored.

Research has found contrasting outcomes between the HAB and social support. Smolkovic et al. (2012) did not find a statistically significant relationship between cat and dog owners with low levels of social support and levels of attachment to companion animals. Similarly, the Winefield et al. (2008) study into the relationship between social support and attachment to companion animals in older adults found no statistically significant relationship. These studies measured the human-animal relationship using the same measure developed by Winefield et al. (2008), and like much of the research assumed a linear relationship between HAB and related mental health outcomes. However, it is possible such relationships may be represented as curvilinear (inverted U curve), where extreme ends of the curve may be indicative of poor health outcomes or alternatively no impact and with a

moderate point being most beneficial (Chur-Hansen et al., 2009). This study suggests a curvilinear relationship may be transferable to the relationship between HAB and other variables, in particular perceived human social support.

It is clear from research findings that the HAB impact on mental health outcomes is complex and lacks established empirical findings, yet is an important one which requires further research with improved methodologies (Herzog, 2011). Therefore, this study contributes to the literature by aiming to address methodological issues within a cross-sectional study design and to determine whether the HAB would moderate mental health constructs, perceived human social support and resilience. It takes a strength-based approach to improve mental health outcomes, as opposed to a problem-oriented approach mainly found within the literature base (Windle, 2011). Furthermore, this study will investigate alternative explanations as to how outcome measures are interpreted, such as to consider a curvilinear relationship between the HAB and social support. There are important implications for both individual psychological therapy as well as public health policy and understanding the psychological determinants of the HAB. For example, in the delivery of mental health care therapists may need to consider the role animal companions play when collaboratively engaging with clients.

Therefore, the current study will explore the resilience of pet owners and non-owners in a large community-based sample, also taking account of one of the best-established predictors of mental health which is human social supports. The following hypotheses were tested 1) There will be no difference in levels of resilience between pet owners and non-owners, 2) There will be a positive significant relationship between levels of perceived human social support and levels of resilience for the whole sample, 3) For pet owners, a

moderately strong HAB will compensate for low levels of perceived human social support, and 4) For pet owners, there will be a curvilinear relationship between the strength of the HAB and perceived human social support: specifically, pet owners with moderately strong HAB may show higher levels of perceived human social support than those with very low or very high HAB.

3.2.3 Method

3.2.3.1 Participants

A convenience sample of 634 community-based Australians was recruited using both online snowball sampling via social media (Baltar & Brunet, 2012), and flyers delivered in a mailbox drop in metropolitan Adelaide, South Australia. Both forms of recruitment prompted participants to consider whether the strength of social connections helped them bounce back from adversity. A link to the online survey was also provided. Data from 82 incomplete responses were excluded from the sample: 2 under 18 years old, 1 living in an institution, and 11 with outlier scores. The final sample included 538 participants (386 females, 151 males, 1 other); 392 (73%) being companion animal owners and 146 (27%) non-owners. The sample included somewhat more females than was representative of the Australian demographic (51%). However, the age range of participants was 18-79 years which closely represented the national adult range (Australian Bureau of Statistics [ABS], 2019). The majority of participants (90.5%) lived with others in a house with garden, household numbers ranged from 1 to 10 occupants (M = 2.82, SD = 1.25), and 9.5% of participants lived alone. The mean level of education completed was bachelor's degree, and most participants were married (47%) or within a domestic partnership (27%). Participants defined their pet ownership status when asked whether they owned a pet or not. When asked to think of their main, closest pet when completing the survey, the majority of pet owners reported having a

dog (62%), 30% were cat owners, and 8% kept either rabbits, birds, horses, fish/reptile or unknown other type of pet.

3.2.3.2 Measures

Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988) is a 12 item self-report measure of perceived social support from three sources: family, friends, and a significant other. Participants were asked to rate how they felt about statements such as "There is a special person who is around when I am in need", "My family really tries to help me", and "I can count on my friends when things go wrong". Responses are made on a 7 point Likert Scale (ranging from 1 = Very strongly disagree; 4 = Neutral; and 7 = Very strongly agree). Scores ranged from 2 to 7 and were calculated by summing the scores to each response and dividing by 12, with a higher score reflecting higher perceived social support. The scale demonstrated suitable internal consistency (Cronbach's alpha = .93).

The Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003) is a 25 item self-report scale of resilience as a measure of stress-coping ability when faced with adversity. Participants responded to statements such as "I am able to adapt when changes occur", "I can deal with whatever comes my way", and "Under pressure, I stay focused and think clearly". Responses were made on a 5 point Likert Scale as to how much an individual agrees that a given statement applied to them over the past month (ranging from 0 = Not True At All to 4 = True Nearly All The Time). Scores ranged from 17 to 75 and were calculated by totaling all responses. Higher scores were indicative of higher resilience. The scale demonstrates satisfactory internal consistency (Cronbach's alpha = .93).

The Lexington Attachment to Pets Scale (LAPS; Johnson et al., 1992) is a 23 item self-report measure of an individual's emotional bond with their companion animal. The test included statements such as 'Quite often I confide in my pet' and 'I love my pet because it never judges me'. Responses were made on 5 point Likert Scale as to how much an individual agreed or disagreed with the listed statements (ranging from 0 = Don't know/refuse to 4 = Agree Strongly). Overall scores ranged from 30 to 90 and were calculated by summing all responses, with higher scores being indicative of higher levels of HAB. The scale demonstrates acceptable internal consistency (Cronbach's alpha = .90).

3.2.3.3 Procedure

The study was granted ethics approval from the Human Research Ethics Committee at the relevant institution. The general population was sampled with efforts made to collect a representation of adults within Australia. Both companion animal owners and non-owners were included for comparative purposes and to improve methodological issues reported within the related literature (Beck & Katcher, 2003; Pachana, Ford, Andrew, & Dobson, 2005; Winefield et al., 2008). Participants were screened for living in households within the community and not in residential care facilities or other institutions (i.e. hospitals, prisons), and to determine that pets were independently cared for and not part of an animal assisted therapy program or therapeutic intervention. The online survey was completed during the participant's own time. Participants were asked to report their interest in participation in future research studies related to the HAB in the event follow up analysis was considered.

3.2.3.4 Statistical Analyses

Data were compiled and analysed using SPSS Version 24.0 (IBM, 2016). Scale reliability was assessed for each scale variable using Cronbach's alpha. Hypothesis one was

investigated using independent samples t-test to determine any difference in levels of resilience (CD-RISC) between pet owners and non-pet owners. Hypothesis two was examined using a Pearson's product-moment correlation coefficient to determine the strength and direction of the linear relationship between levels of perceived human social support (MSPSS) and resilience (CD-RISC). The coefficient of determination was then calculated by squaring the r value and multiplying by 100 to convert to a percentage of the variance shared between both variables (Pallant, 2016). Hypothesis three was examined using a linear regression model with interaction term to investigate whether the strength of the HAB (LAPS) moderated the relationship between social support and resilience. Finally, hypothesis four was investigated by visual inspection of the scatterplot of the strength of the HAB (x-axis) and perceived human social support (y-axis). A line of best fit was added to the scatterplot to determine the direction of the relationship between the variables. Further analysis was undertaken using a linear regression model with quadratic term to determine if a statistically significant non-linear (i.e. curvilinear) relationship existed between the variables and determine the direction of this relationship (i.e. U-curve or inverted U-curve).

3.2.4 Results

Preliminary analyses of each linear regression model assessed assumptions of normality of residuals, linearity, and homogeneity of variance via visual inspection of histograms, box plots, scatter plots, normal probability plots, and assessment of skewness and kurtosis statistics. Testing indicated that residuals of the first linear model were slightly skewed; however such a violation was justified because of the large sample size (Pallant, 2016). There were no violations of the remaining assumptions that would adversely affect the analysis. Descriptive statistics for all measures are provided in Table 1.

Table 1

Descriptive statistics for all measures. Means, standard deviations and ranges of whole sample, pet owners and non-owners

Scale		Pet Owners *(n = 392)*	Non-Owners *(n = 146)*	Total *(n = 538)*	Range of Scores
Multidimensional Scale of Perceived Social Support					
	M (SD)	5.78 (0.96)	5.74 (0.98)	5.77 (0.96)	2-7
Connor-Davidson Resilience Scale					
	M (SD)	49.38 (11.85)	48.23 (11.48)	49.07 (11.75)	17-75
Lexington Attachment to Pets Scale					
	M (SD)	69.63 (13.30)	-	-	30-90

† M = Mean; SD = Standard Deviation

Hypothesis one predicted that there would be no difference in levels of resilience between pet owners and non-owners. An independent samples t-test was conducted to compare the level of resilience scores between pet owners and non-owners. There was no significant difference in scores for owners (M = 49.29, SD = 11.86) and non-owners (M = 48.30, SD = 11.48; t (542) = .87, p = .38, two tailed). Therefore, the results support the hypothesis that owners and non-owners do not differ in their resilience.

The second hypothesis predicted that there would be a positive relationship between perceived human social support (MSPSS) and resilience (CD-RISC 10). A Pearson product-moment correlation analysis was undertaken with the whole sample, both pet owners and non-pet owners. A statistically significant positive correlation was found between levels of perceived human social support and levels of resilience (r = .300, n = 544, p <.001). The shared variance, also referred to as coefficient of determination, between the two variables is 10%. Therefore, social support helps to explain approximately 10% of the variance in participants' scores on the Resilience scale. These findings suggested that higher levels of perceived human social support are associated with higher levels of resilience, providing support for this prediction.

The third hypothesis predicted that there would be a significant moderating effect of the HAB variable on the relationship between perceived human social support and resilience, in that individuals with a strong HAB may be able to compensate for low levels of human support. For simplicity of interpretation, the interaction term used was based on the categorical LAPS variable (1 standard deviation from the mean cut-offs) and categories calculated for the perceived human social support (MSPSS) variable (Low < 3, Moderate = 3-

5, High > 5) based on the clinically defined cut offs determined by the measure developers (Zimet et al., 1988). Using a linear regression model with outcome resilience and the aforementioned interaction term, it was found there was no statistically significant interaction between perceived human social support and HAB for the outcome resilience (interaction p = .795). Therefore, there is no evidence that pet owners with low social support have better resilience if they have a strong HAB, so the third hypothesis is not supported.

Since the prediction that HAB would moderate the relationship between perceived social support and resilience was not supported, we tested whether the relationship between HAB and social support may be curvilinear. The fourth hypothesis predicted that there would be a curvilinear relationship between HAB (LAPS) and perceived human social support (MSPSS) in a pet owner sample. Visual inspection of the scatterplot of Lexington Attachment to Pets Scale (LAPS) (x-axis) and Multidimensional Scale of Perceived Social Support (MSPSS) (y-axis) suggested a curvilinear relationship (see Figure 1). A linear regression model with quadratic term was conducted for outcome MSPSS and predictors LAPS. The results showed a statistically significant quadratic term for HAB in this model (β estimate = -.009, p = .001). Furthermore, the estimate for the quadratic term is negative, indicative of an inverted U shape in the relationship between perceived human social support and HAB, providing support for the prediction. These findings suggest that pet owners with either high or low levels of HAB are more likely to have lower levels of human social support, however those with moderate levels of HAB are more likely to have higher levels of human social support.

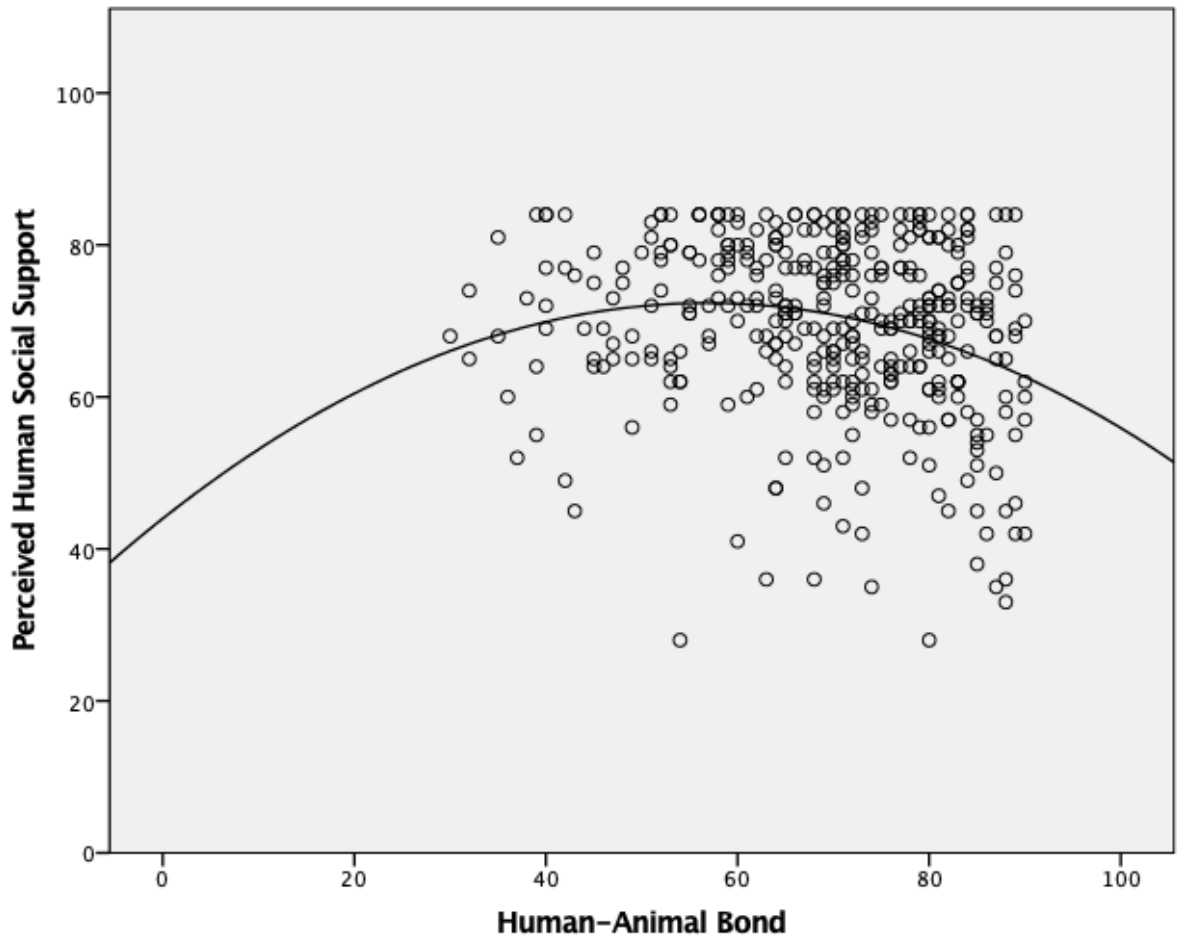

Figure 1. Scatterplot of correlation between measure of human-animal bond (LAPS; Johnson et al., 1992) and perceived human social support (MSPSS; Zimet et al., 1988), with line of best fit represented in inverted U curve.

3.2.5 Discussion

The paper reports a cross-sectional study of a large community sample of pet owners (n = 392) and non-owners (n = 146) who provided information about their human social supports and resilience, and in the case of pet owners, the strength of their emotional bond to their companion animal. The research aims of the present study were to explore the relationships between the human-animal bond (HAB), perceived human social support, and resilience to determine whether the relationship between perceived human social support and resilience would be moderated by the HAB. Given the possible non-linearity of the HAB

construct (Antonacopoulos & Pychyl, 2010; Chur-Hansen et al., 2009), consideration was given to a curvilinear relationship between HAB and resilience. Therefore, this study contributes additional information to the existing literature about the relationship between animal companionship and human mental health, and possible alternative considerations for future research.

This study does not suggest that pet ownership or merely the presence of a pet leads to increased levels of resilience. However, proposed an original formulation that the HAB may act as a substitute for low levels of perceived social support in pet owners due to the unique characteristics the HAB offers pet owners. For this to be the case, it was hypothesized that there would be no difference in resilience between pet owners and non-owners which was supported by the findings. This builds support for the proposal that the strength of the HAB, and not pet presence alone, contributes to the effect of the HAB and how it interacts with other mental health outcomes (Brooks et al., 2018). However, there are many contributing factors to resilience (Haskett et al., 2006; Southwick et al., 2018; Rutter, 1985), and we suggest it is not pet ownership but the complexities of the HAB that add to those factors influencing resilience, specifically in those with compromised human social supports.

Given the impact negative life events have on mental health and the prevalence of mental health conditions within Australia (AIHW, 2018; Rutter, 1985), finding ways to support and increase levels of resilience is becoming increasingly important for mental health intervention. This study found that perceived human social support was significantly associated with resilience, in that individuals with higher levels of perceived social support are more likely to have higher levels of resilience. This finding is consistent with previous research indicating perceived social support from family, friends, and significant other as a

protective factor for resilience (Pejičić et al., 2018; Southwick et al., 2018). Furthermore, it also supports research that suggests positive social supports predict resilience which in turn helps alleviate negative mental health outcomes (McNicholas & Collis, 2006; Pejičić et al., 2018). Indeed, perceived human social supports have become a focus within mental health intervention by being integrated into clinical assessment and considered as a protective factor for risk. These findings also recognize that individuals with low perceived human social support may need to be targeted with psychological intervention to increase their protective factors and have better outcomes for treatment.

Given that research findings indicate those with low perceived human social support have lower levels of resilience, it was hypothesized that a moderately strong HAB may be a substitute for those with low perceived social support and influence levels of resilience. Results indicated that the HAB does not moderate perceived social support as a protective factor of resilience. Contrary to findings that the HAB successfully acts as a moderator for low social support and mental health related outcomes (Bryan et al., 2014; Siegel et al., 1999), these findings offer support to evidence that the HAB does not provide a buffering effect (Antonacopoulos & Pychyl, 2010; Peacock et al., 2012). This may be partly due to the assumed linear relationship between HAB and mental health related outcomes, and highlights the complexities of the HAB construct (Serpell, 2011; Hosey & Melfi, 2014; Brooks et al., 2018). There may be essential components of human social support required to meet individual needs in those with low human social support that the HAB cannot fulfil. This proposal offers support to Serpell's (2011) suggestion that one but not necessarily all components offered by human social support (Collis & McNicholas, 1998), may be the elements of the HAB that contribute to positive mental health outcomes.

It is possible the assumed linearity of the scale used to measure HAB may have impacted the outcome, not only in this particular study but others within the evidence base. Therefore, it was possible that the interaction of the strength of the HAB (independent) and perceived human social support (dependent) variables do not result in a linear relationship. The findings of a curvilinear relationship (i.e. an inverted U) between the human-animal bond and levels of perceived human social support provide support to this hypothesis and the suggestion made by Chur-Hansen et al. (2009) that stronger relationships with a companion animal may be associated with greater psychological distress. This is also consistent with literature that shows increased levels of the HAB with low levels of social support (Antonacopoulos & Pychyl, 2010; Netting et al., 2013; Smolkovic et al., 2012; Stallones et al., 1990). The complex relationship between HAB and social support may indicate that those with low social support and poor mental health may develop particularly strong and possibly dysfunctional relationships with their pets, or that a weak HAB may be associated with poorer mental health outcomes. Assessing the mechanisms and effects of a significantly weak or strong HAB is an area for future research.

A strength of this study is the large sample, and in particular its representativeness of the population age range as many studies focus on samples of young children or older adults. The method of online data collection resulted in a reduced number of older participants (i.e. 60+ years old), and therefore the sample was not wholly representative. Although the researchers attempted data collection from a varied range of community members and were not solely reliant on online snowball sampling, the online survey format may not have been accessible or appealing to older age participants. Therefore, an alternative method of data collection should be considered for this age group in future research studies. The study also improved on methodologies such as including a control group, using standardized measures,

and reporting nil effects. A particular strength was focusing on the strength of the HAB and not just the effects of pet ownership alone. However, the underpinning mechanisms of how the strength of the HAB impacts specific subpopulations, such as individuals with strong HAB and lower levels of perceived social support and in what ways the HAB may differ from human-human supports, could be further explored within future research. Furthermore, future research may take into account that complexities and variable findings throughout the research may vary and impact study outcomes. For example, comparing pet owners and non-owners health outcomes may not be appropriate because some health differences could be due to differences in socio-demographic variables, such as gender and age, and not necessarily pet ownership patterns. Researchers also need to consider possible selection biases when designing methodology (Saunders, Parast, Babey, & Miles, 2017). Finally, the impact of the number of pets owned and possible pet selection biases have on health and mental health outcomes should be an area for future research.

3.2.5.1 Clinical Implications

The strength of the HAB could be taken into consideration within a clinical psychology setting as an influence on an individual's mental health status and/or ability to engage in intervention (Fine, 2019). For example, individuals who have inadvertently come to care for a pet through relinquishment from family members or friends and have an particularly weak relationship with the pet, yet feel compelled to care for the pet, may experience pressures of continued care (i.e. financial, exercise, nurturing) that can negatively impact on mental health. Similarly, those with exceptionally strong bonds with their pet may develop negative mental health outcomes resulting in isolation and reduced social contact or engagement in self-care activities. For example, that might apply when they are forced to relinquish their pet due to public housing policy, or alternatively not be able to leave home if

they fear separation from their pet or for their pets' health. Furthermore, individuals with strong HAB could be over reliant on their pet for companionship and consider themselves adequately supported through their HAB, resulting in loss of all the components human social support offers.

3.2.5.2 Conclusion

Although there are possible limitations to this study, the sample from the general population within the Australian community and the use of standardised, validated measures which systematically assess perceived social support, the HAB, and resilience, means the outcomes add value and understanding to the human-animal bond literature. This study argues that the strength of the HAB may act as a substitute for certain elements of human social support, such as emotional and social supports, that contribute to increased levels of resilience. It is not solely owning an animal companion that will provide benefits but the nature of the relationship that acts as a buffer for adversity. The study outcomes show again that perceived human social support is positively related to resilience. Although the HAB did not moderate the relationship between perceived human social support and resilience, the findings suggest that the human-animal bond may not be a linear construct but one that acknowledges extremely weak or strong bonds may be correlated with a reduced capacity to build resilience and work through adversity. Finally, future research could investigate possible implications for weak or strong bonds within the general community, but also within specific subgroups where it is possible human-animal bonds may have a more direct effect.

Chapter 4. Exploring the demographic characteristics of individuals with low to moderate human social support and strong human-animal bonds

4.1 Statement of Contribution

Statement of Authorship

Title of Paper	Exploring the demographic characteristics of individuals with low to moderate human social support and strong human-animal bonds.
Publication Status	☐ Published ☐ Accepted for Publication ☑ **Submitted for Publishing** ☐ Unpublished and Unsubmitted work written in manuscript style
Publication Details	Submitted for publishing to *Anthrozoos* on 11 February 2021

Principal Author

Name of Principal Author (Candidate)	Lian Hill		
Contribution to the Paper	Conducted the literature review, developed the aims, designed the study, collected and analysed the data, and wrote the manuscript.		
Overall percentage (%)	90%		
Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper.		
Signature		Date	09.02.2021

Co-Author Contributions

By signing the Statement of Authorship, each author certifies that:

i. the candidate's stated contribution to the publication is accurate (as detailed above);
ii. permission is granted for the candidate in include the publication in the thesis; and
iii. the sum of all co-author contributions is equal to 100% less the candidate's stated contribution.

Name of Co-Author	Helen Winefield		
Contribution to the Paper	Supervised and consulted on the aims of the paper, description and interpretation of results, and preparation of the report for publication. (5% contribution)		
Signature		Date	7.02.2021

Name of Co-Author	Pauleen Bennett		
Contribution to the Paper	Supervised and consulted on the aims of the paper, description and interpretation of results, and preparation of the report for publication. (5% contribution)		
Signature		Date	9.2.2021

Please cut and paste additional co-author panels here as required.

4.2 Paper

4.2.1 Abstract

Objective: The Human-Animal Bond (HAB) has been shown to have a curvilinear relationship with human social support, such that a high level of support from people is associated with a moderate strength of HAB. Human social support is considered a protective factor against mental health decline, yet the HAB does not moderate the relationship between human social support and resilience. This study aimed to explore the characteristics of companion animal owners with strong HAB and low to moderate human social supports.
Method: A large sample of companion animal owners (n = 392) provided information about their perceived relationship with their human social supports and the strength of the emotional connection to their companion animals, as well as demographic information.
Results: Single people, those under the age of forty years, females, and people who had completed high school education or less, were more likely to have higher levels of HAB. Married people and those with postgraduate degrees tended to have more human social support. Single females were more likely to have low to moderate levels of human social support and stronger HAB.
Conclusion: Single females with lower human supports and strong HAB may be at risk of experiencing lower levels of resilience. Future research should explore this subpopulation in-depth to determine how human social supports and companion animal relationships compare, as well as understand how companion animals may provide aid throughout adversity for those who have a strong HAB.

Key words: companion animals, human social support, human-animal bond, mental health, pet

4.2.2 Introduction

Introduction

Human social support has been considered one of the best-established predictors of mental health. Research has shown that social support is a protective factor for the impact of adverse experiences and mental health decline (Harris et al., 2019; Herbell & Zauszniewski, 2019; Islam, 2013; Kleiman & Liu, 2013; Zadravec Šedivy, Podlogar, Kerr, & De Leo, 2017). For individuals who have limited social support, it's important to determine whether there are other social influences that can act as potential risk or protective factors in their lives. Companion animals have been described as central to many people's lives and comparable in effect to human social support (Amiot, Bastian, & Martens, 2016; Fitzgerald, 2016; Flynn, 2000). Johnson et al. (1992) found those with fewer social supports had a stronger bond with their companion animals, and Hill, Winefield, and Bennett (2020) found evidence of a curvilinear relationship (i.e. an inverted U) between the levels of perceived human social support and strength of the human-animal bond (HAB). Therefore, those with a stronger bond may have lower levels of resilience. However, there is limited research investigating the relationship between lower levels of human social support and strong HAB, and what are the demographic characteristics of that subpopulation. Understanding such subpopulations, who they are and how they respond to relationships enables mental health professionals to establish rapport with clients and tailor treatment approaches accordingly (Johnson & Bruneau, 2019; Langston, 2019).

Social support in human-human relationships has been shown to contribute to positive mental health and wellbeing, and is broadly defined as involving a range of affirming actions, interpersonal exchanges, and social conditions that are generated from social relationships

(Gore, 1985; McNicholas & Collis, 2006; Teismann et al., 2018). Furthermore, Langford et al. (1997) described the four defining attributes of social support as emotional, instrumental, informational, and appraisal, which resulted in positive consequences such as increased psychological wellbeing, positive affect, and successful coping behaviours. Several research findings indicated that social support benefits individuals in adapting to challenges and difficulties within their environment (Caplan et al., 1976; Haskett et al., 2006; Luthar & Zigler, 1991; Southwick & Charney, 2018), whereas low levels of social support are associated with lower levels of resilience (Hill et al., 2020; Pejičić et al., 2018).

Companion animals have been found to provide some of the qualities offered by human social support, such as being social surrogates and enhancing social affect regulation (Brown & Coan, 2016), and they are often perceived as a source of emotional support by their owners (Meehan et al., 2017). Other research showed the HAB offered unique characteristics not necessarily found within human social support relationships: a sense of responsibility, positive contributions to physical health, a reason to live, and pleasure (Chandler, Fernando, Barrio Minton, & Portrie-Bethke, 2015; Fitzgerald, 2016; Irvine, 2004). Alternatively, these constructs may have a curvilinear relationship which could result in compromised resilience due to reduced human social support (Hill et al., 2020). Serpell (2011) suggested companion animals may fulfill those *social and emotional* needs similar to those fulfilled by human social supports, however it is the *strength* of the relationship that may be related to possible benefits or disadvantages of HAB. For example, Krause-Parello (2012) found companion animal attachment support was a coping resource for lower levels of loneliness and depressed mood. Yet, Antonacopoulos and Pychyl (2010) found companion animal owners with low levels of human social support and strong HAB had increased

loneliness and depression, and concluded that the HAB and its relationship with psychological health outcomes was complex.

There is limited research investigating the strength of the HAB and the interaction with human social support, and in particular which subpopulations may be impacted by very strong HAB. Given there are approximately 24 million companion animals in Australia with more than two-thirds of Australian homes having a companion animal (Animal Medicine Australia [AMA], 2016), it is important to understand more about the HAB relationship. For the purposes of this study, animal companionship is defined as an outcome of community-based individuals living with a companion animal with the intention of providing lifelong care and having a relationship based on a series of interactions (Hill et al., 2020). The HAB framework is based on companion animals providing a supportive relationship in the form of emotional support and buffering which ameliorates the impact of adverse stressors on mental health (Garrity et al., 1989; McConnell et al., 2011).

The effect of the HAB and any potential benefits may be specific to selected population groups (Herzog, 2011; Stallones et al., 1990). Despite a plethora of descriptive studies investigating the HAB and mental health outcomes, there is limited conclusive evidence from descriptive studies investigating the demographic correlates of the HAB. This may be due to methodological weaknesses, such as file-drawer effect, overuse of cross-sectional study design, and many anecdotal reports, which in turn could contribute to a lack of unity amongst researchers in terminology, theoretical frameworks, and findings (Chur-Hansen et al., 2010; Herzog, 2011; Hosey & Melfi, 2014; McCardle, McCune, Griffin, & Maholmes, 2011). Some studies have found no statistically significant relationship between outcome variables such as companion animal ownership or pet attachment and demographic

factors such as gender, age, education, marital status, income and number of people in the household (Quinn, 2005; Stallones et al., 1990; Zilcha-Mano et al., 2011).

Research found single participants were more attached to their companion animal than those who were married (Kidd & Kidd, 1989). However, a thorough study exploring the demographic differences of companion animal owners found most owners were female, married, white and living in a house, but level of education was not included amongst the demographic variables studied (Saunders et al., 2017). On the other hand, Martens, Enders-Slegers, and Walker (2016) found dog owners with higher levels of education (college/university) had weaker bonds with their dogs than those with lower levels of education (primary school). In regard to gender differences, Johnson et al. (1992) found significant differences between male and female attachment to companion animals, with women showing stronger bonds than men. Similarly, women were more likely to have a companion animal, have a stronger bond, and report less complications with them than men (Bao & Schreer, 2016; Cohen, 2002; Martens et al., 2016; O'Dwyer & Thompson, 2018; Zimolag & Krupa, 2009). However, Blazina and Kogan (2016) suggested males may consider their companion animals as a reliable support yet have been studied in the context of traditional gender roles and masculinity which can affect the reporting of experiences and subsequent outcomes. Little to no gender differences have been found in a varied range of anthrozoological areas (Herzog, 2007; Prato-Previde, Fallani, & Valsecchi, 2006). However, more specific investigation is needed that takes complex contextual factors into account, such as presence of human social support, age and previous experiences with companion animals (Blazina & Abrams, 2019).

The majority of age-related HAB research has focused on either young children or older adults. Pruchno, Heid, and Wilson-Genderson (2018) found older (aged 50 to 74 years) cat and dog owners with lower social support had higher levels of successful aging and stronger ability to function than non-owners who reported high levels of support, yet this study focused on the impact of owning a companion animal rather than the strength of the bond. However, Winefield et al. (2008) found no relationship between social support and attachment to companion animals in older adults. Conversely, in a survey of companion animal owners impacted by bushfires, O'Dwyer and Thompson (2018) found younger participants (aged 35 to 44 years) were more likely to report lower levels of attachment to their companion animals compared to older people. Companion animal owners in Australia are most likely to be aged eighteen to forty-nine years (AMA, 2016), but there are limited research studies examining HAB and perceived human social support in people under 40 years old.

Overall, companion animals have been shown to be an important source of support for individuals managing long-term mental health problems, particularly when other support networks were limited or difficult (Brooks et al., 2016). Given the possibility that animal companions contribute unique supportive characteristics that affect owners' mental health (Brooks et al., 2018; Serpell, 2011), and their potential therapeutic value, there is little mention of them within clinical and research training (Walsh, 2009). This study aimed to address methodological concerns within the HAB field of research by utilizing a mixed methods two-way approach with follow-up exploratory design (Gelo et al., 2008). It extends a rigorous cross-sectional study that improved on reported methodological weaknesses (Hill et al., 2020), and prepares for a follow-up qualitative study. Specifically, we used quantitative methods to identify a targeted sample for more comprehensive qualitative interviews. The

present study sought to understand whether there were any differences between age groups, marital status, gender, and/or education levels on the HAB and social support. Furthermore, this study aimed to establish the demographic predictors of participants with high HAB and low to moderate human social support.

4.2.3 Method

4.2.3.1 Participants

The dataset for this study was taken from a cross-sectional study conducted by Hill, Winefield and Bennett (2020). A convenience sample of 634 community-based Australians was recruited using both online snowball sampling via social media (Baltar & Brunet, 2012), and flyers delivered in a mailbox drop in metropolitan Adelaide, South Australia. Both forms of recruitment prompted participants to consider whether the strength of social connections helped them bounce back from adversity. A link to the online survey was also provided. Data from 82 incomplete responses were excluded from the sample, also 2 under 18 years old, 1 living in an institution, and 11 with outlier scores, which resulted in a sample of 538 companion animal owners and non-owners. Only the sample of 392 companion animal owners was used for the present exploratory study. Similar to the previous study, the companion animal sample included more females than males than was representative of the Australian demographic (73%) (Australian Bureau of Statistics [ABS], 2019). However, the age range of participants was 18-74 years which closely represented the national adult range (ABS, 2019). The majority of participants (87.5%) lived in a house with garden, household numbers ranged from 1 to 10 occupants (M = 2.88, SD = 1.27), and 6% of participants lived alone. The modal level of education completed was bachelor's degree, and most participants were married (47%) or within a domestic partnership (27%). Participants defined their pet ownership status when asked whether they owned a pet or not. When asked to think of their

main, closest pet when completing the survey, the majority of pet owners reported having a dog (63%), 30% were cat owners, and 7% kept either rabbits, birds, horses, fish/reptile or unknown other type of pet.

4.2.3.2 Measures

Scales from the previous study that were included for the purposes of this exploratory study were:

Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988) is a 12 item self-report measure of perceived social support from three sources: family, friends, and a significant other. Participants were asked to rate how they felt about statements such as "There is a special person who is around when I am in need", "My family really tries to help me", and "I can count on my friends when things go wrong". Responses are made on a 7 point Likert Scale (ranging from 1 = Very strongly disagree; 4 = Neutral; and 7 = Very strongly agree). Scores ranged from 2 to 7 and were calculated by summing the scores to each response and dividing by 12, with a higher score reflecting higher perceived social support. The scale demonstrated suitable internal consistency (Cronbach's alpha = .93).

The Lexington Attachment to Pets Scale (LAPS; Johnson et al., 1992) is a 23 item self-report measure of an individual's emotional bond with their companion animal. The test included statements such as 'Quite often I confide in my pet' and 'I love my pet because it never judges me'. Responses were made on 5 point Likert Scale as to how much an individual agreed or disagreed with the listed statements (ranging from 0 = Don't know/refuse to 4 = Agree Strongly). Overall scores ranged from 30 to 90 and were

calculated by summing all responses, with higher scores being indicative of higher levels of HAB. The scale demonstrates acceptable internal consistency (Cronbach's alpha = .90).

4.2.3.3 Procedure

The study was granted ethics approval from the Human Research Ethics Committee at the relevant institution. The general population was sampled with efforts made to collect a representation of adults within Australia. Participants were screened for living in households within the community and not in residential care facilities or other institutions (i.e. hospitals, prisons), and to determine that pets were independently cared for and not part of an animal assisted therapy program or therapeutic intervention. The online survey was completed during the participant's own time. Participants were asked to report their interest in participation in future research studies related to the HAB in the event follow up analysis was considered.

4.2.3.4 Statistical Analyses

Data were compiled and analysed using SPSS Version 24.0 (IBM, 2016). Scale reliability was assessed for each scale variable using Cronbach's alpha. Descriptive statistics were reported for the scale measures (MSPSS and LAPS) and demographic variables (sex, age, education, and marital status). T-tests were conducted to determine the differences between mean scores for the demographic variable groups (gender = male/female, age = 18-39 years/40+ years, and marital status = single/married or in domestic partnership) on the outcome variables, perceived human social support (MSPSS) and human animal bond (LAPS). A one-way ANOVA test was conducted to determine the difference between levels of education (high school or less/undergraduate degree/postgraduate degree) and the outcome variables. Eta squared was manually calculated and used as an estimate of effect size (Pallant,

2016). Generalised Linear Models (GLM) were used to examine the association and interaction effect between the demographic independent variables and perceived human social support with the outcome variable, human-animal bond. Individual models were run for each independent variable (sex, age, marital status, and education) to test for the interaction effect with perceived human social support on the HAB. Finally, for those models that indicated statistically significant interaction effects, a post-hoc pairwise comparison analysis was conducted.

4.2.4 Results

Descriptive statistics for the independent variables (demographic groups) and as a function of the dependent variables (perceived human social support and HAB) are shown in Table 1. Participants who were single were significantly more likely to have higher levels of HAB score ($t_{(390)}$ = -2.88, p = .004, two tailed), but the magnitude of the difference in means (mean difference = -4.46, 95% CI: -7.50 to -1.42) was very small (eta squared = .02). There was a significant difference for age and the HAB ($t_{(390)}$ = 4.43, p < .001, two tailed). Participants who were under 40 years old were more likely to have higher levels of HAB score. The difference in means (mean difference = 5.83, 95% CI: 3.24 to 8.41) showed a moderate effect size (eta squared = .05). There was a significant difference for gender and the HAB ($t_{(389)}$ = -4.45, p < .001, two tailed). Female participants were more likely to have higher levels of HAB. The difference in means (mean difference = -6.62, 95% CI: -9.55 to -3.69) was a moderate effect size (eta squared = .05). There was a significant difference for education and the HAB ($F_{(2, 389)}$ = 3.90, p = .02). Post-hoc comparisons using the Tukey HSD test showed the mean score for participants with High School or Less (M = 69.28, SD = 12.34) was significantly higher than those with Postgraduate Degrees (M = 67.28, SD = 12.73). Those with Undergraduate Degrees did not significantly differ from either those with

High School or Less or Postgraduate Degrees. Despite reaching statistical significance, the actual difference in mean scores between the groups was small (eta squared = .02).

Table 2: Descriptive statistics for perceived human social support and human-animal bond.

		Perceived Human Social Support (MSPSS)		**Human-Animal Bond (LAPS)**	
	n	*M*	*SD*	*M*	*SD*
Gender					
Female	287	69.64	11.721	71.39	12.910
Male	104	68.47	10.764	64.77	13.287
Age					
18 – 39	206	69.16	11.534	72.40	12.401
40 >	186	69.58	11.427	66.57	13.628
Marital Status					
Married/Partner	296	71.39	10.100	68.54	13.705
Single	96	63.08	13.117	73.00	11.401
Education					
High School or Less	77	67.95	12.770	73.06	12.337
Undergraduate	239	68.85	11.445	69.28	13.615
Postgraduate	76	72.39	9.631	67.28	12.731

There was no significant difference between gender or age groups and perceived human social support (MSPSS). However, were was a significant difference between marital

status and MSPSS ($t_{(390)} = 6.48$, $p < .001$, two tailed). Participants who were married were more likely to have higher levels of MSPSS than single people. The amount of the difference in means (mean difference = 8.31, 95% CI: 5.79 to 10.83) showed a moderate to large effect (eta squared = .10). There was also a significant difference for education and MSPSS ($F_{(2, 389)} = 3.53$, $p = .03$). Post-hoc comparisons using the Tukey HSD test showed the mean score for participants with High School or Less ($M = 67.95$, $SD = 12.77$) was significantly difference from those with Postgraduate Degrees ($M = 72.39$, $SD = 9.63$). There was also a significant difference in mean scores between those with Undergraduate Degrees ($M = 68.85$, $SD = 11.45$) and those with Postgraduate Degrees ($M = 72.39$, $SD = 9.63$). Those with Undergraduate Degrees did not significantly differ from either those with High School or Less. The difference in mean scores between the groups found a small effect size (eta squared = .02).

Preliminary analyses of each linear regression model assessed assumptions of normality of residuals, linearity, and homogeneity of variance via visual inspection of histograms, box plots, scatter plots, normal probability plots, and assessment of skewness and kurtosis statistics. Testing indicated that residuals of the linear model were slightly skewed; however such a violation was justified because of the large sample size (Pallant, 2016). There were no violations of the remaining assumptions that would adversely affect the analysis. For simplicity of interpretation, the interaction terms used were based on the categorical independent variables outlined previously and categories calculated for the perceived human social support (MSPSS) variable (Low < 3, Moderate = 3-5, High > 5) based on the clinically defined cut offs determined by the measure developers (Zimet et al., 1988). Given there were only three participants in the Low MSPSS group, this group was combined with the Moderate MSPSS group to create a new group, Low-Moderate MSPSS.

Three separate linear regression models were performed with outcome HAB and a 2-way interaction, controlling for other demographic covariates. It was found that there was statistically significant interaction between perceived human social support and gender for the outcome HAB (interaction $p = .008$), as well as between perceived human social support and marital status for the outcome HAB (interaction $p = .02$). There was no statistically significant interaction between perceived human social support and age or education levels for the outcome HAB (interaction $p = .147$ and $p = 671$, respectively). Therefore, a 3-way interaction model was performed between gender, marital status and human social support for the outcome HAB which was found to be statistically significant. Results of the 3-way interaction model can be found in Table 2. Post-hoc analysis of pairwise comparisons indicated that single females with low to moderate human social support have a mean HAB value of 7.99 units more than those with high human social support, whereas married/partnered males with low to moderate human social support have a mean HAB value of 13.6 units less than those with high human social support (see Figure 1).

Table 3. Three-way interaction model between perceived human social support, marital status and gender for outcome HAB.

Outcome	Interaction	Human Social Support	Marital Status	Gender	Estimate (95% CI)	Comparison P value	Interaction P value
Human Animal Bond	Human social support*Marital Status*Gender			Male	-13.6 (-21.9, -5.3)	.001***	0.006
		Low to Moderate vs High	Married/ Partner	Female	6.11 (0.85, 11.36)	.023*	
			Single	Male	10.93 (-0.55, 22.40)	.062	
				Female	7.99 (2.49, 13.49)	.004*	
		Low to Moderate	Married/Partner vs Single	Male	-21.5 (-32.7, -10.4)	<.001***	
				Female	-1.76 (-8.35, 4.83)	.601	
		High		Male	3.01 (-5.83, 11.86)	.504	
				Female	.12 (-3.65, 3.89)	.951	
		Low to Moderate	Married/Partner	Male vs Female	-24.87 (-34.17, -15.58)	<.001***	
			Single		-5.11 (-14.14, 3.92)	.267	
		High	Married/Partner		-5.16 (-8.43, -1.89)	.002**	
			Single		-8.05 (-17.13, 1.02)	.082	

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

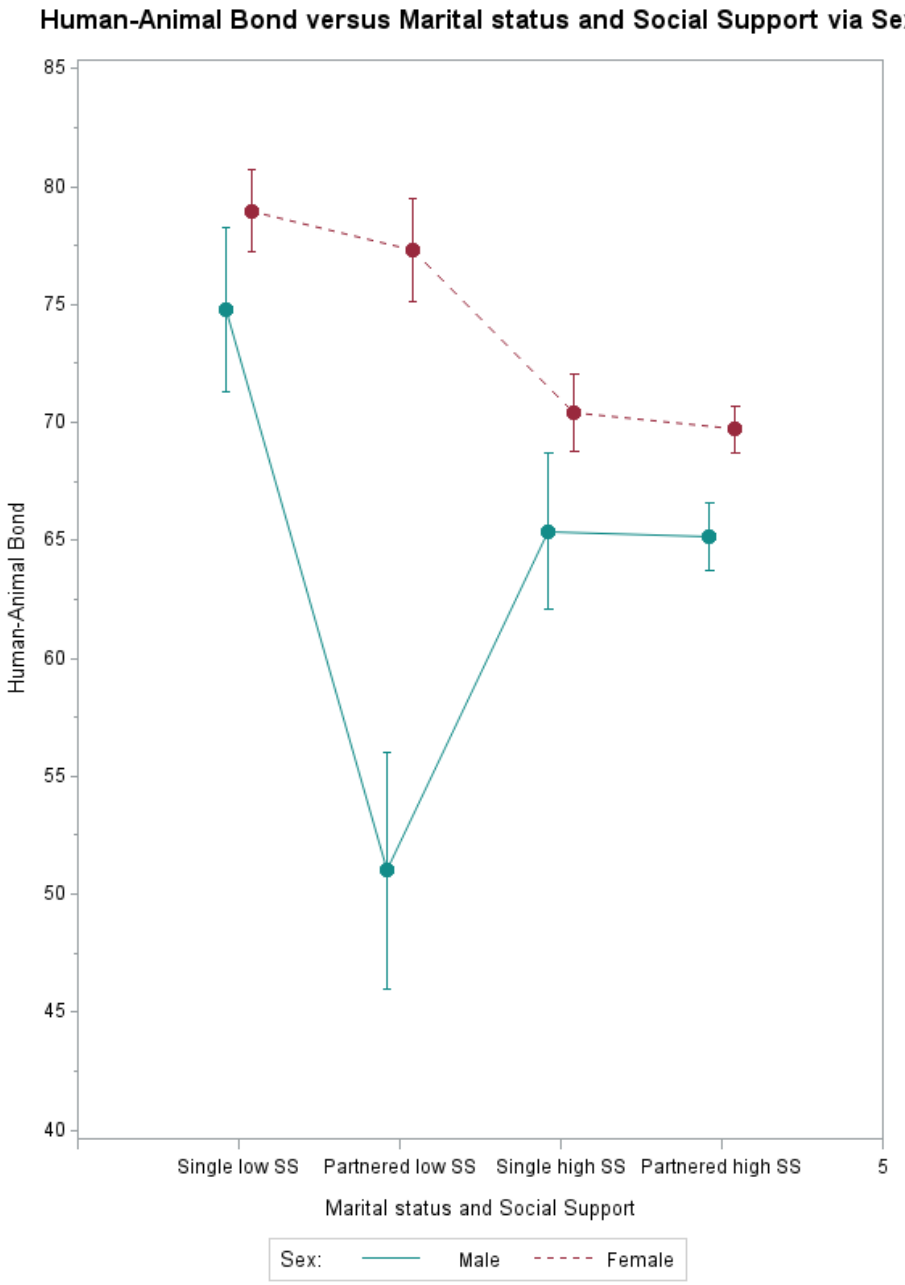

Figure 2. The interaction of marital status and gender with human social support on the outcome human-animal bond.

4.2.5 Discussion

The purpose of this study was to explore the demographic characteristics of people who reported low to moderate levels of perceived human social support and strong human-

animal bond (HAB), based on findings from Hill et al. (2020) of a curvilinear relationship between perceived human social support and HAB. This paper is a descriptive, exploratory study of a large community sample of companion animal owners, who provided information about their human social supports, strength of their bond with their companion animal, as well as a range of demographic information. The aims of the study were to determine whether there were any differences between age groups, marital status, gender, and education levels on the HAB and human social support. Furthermore, the study aimed to establish the demographic predictors of the HAB when those demographic factors interacted with human social support. Therefore, findings from this study contribute added evidence to the existing literature about the demographic factors associated with HAB and perceived human social support, but also how they interact with levels of human social support to predict the HAB. Furthermore, due to the unexplored curvilinear relationship found between human social support and the HAB, in determining what subpopulation most likely fits this category, the novel findings from this study can help direct future research. In turn, these findings inform mental health practitioners, such as psychologists, with specific information about subpopulations that have strong relationships with their companion animals that may impact upon the therapeutic process.

In establishing which demographic factors were more likely to predict strong bonds with the companion animal, it was found that single people, those under the age of forty years old, females, and people who had completed high school education or less, were more likely to have higher levels of HAB. Despite previous research finding no significant differences in marital status and strength of the HAB (Quinn, 2005; Stallones & Johnson, 1990), this finding is consistent with previous research findings that single people were more connected to their companion animal (Kidd & Kidd, 1989). There could be limited research into the

HAB and marital status due to the evidence that those who are married or in a permanent relationship are more likely to have higher levels of social support (Antonacopoulos & Pychyl, 2010), and therefore an individual's marital status may not impact the HAB. Findings from this study did not support previous research that found no differences in age and companion animal attachment (Stallones et al., 1990; Zilcho-Mano et al., 2011), nor evidence that found thirty-five- to forty-four-year-olds were more likely to have lower levels of the HAB (O'Dwyer & Thompson, 2018), however this could be due to the differences in the samples, such as cultural differences or individual differences in target groups studied. Similarly, findings from this study did not support some previous evidence of no gender differences (Zilcho-Mano et al., 2011), yet supported several other findings that females had stronger bonds with their companion animals (Johnson et al., 1992; Martens et al., 2016; O'Dwyer & Thompson, 2018). Conversely, this study provided support for Martens' et al. (2016) findings that dog owners with more education (college, university) have lower levels of HAB, although this study's findings are based on a wider range of pet types.

In determining which demographic groups were more likely to have low to moderate levels of perceived human social support, this study found no significant differences between genders or age groups. This is contrary to evidence which suggested older adults who owned companion animals were more likely to have higher levels of human social support (Muraco, Putney, Shiu, & Fredriksen-Goldsen, 2018). However, this study did find that married people were more likely to have higher levels of social support than single people, similar to other findings in the research (Antonacopoulos & Pychyl, 2010). A novel finding within this sample of companion animal owners, was that those with high school education or less or undergraduate degrees were more likely to have lower levels of human social support than those with postgraduate degree. Together with the demographic differences found in those

with strong HAB, and the differences for those with low to moderate human social support, such findings can provide a foundation for future research of subpopulations that can investigate whether the strength of the companion animal relationship functions as a risk or protective factor.

After controlling for demographic influences, this study found single females with lower to moderate levels of human social support were more likely to have stronger bonds with their companion animal. Whether single females consider their companion animal to meet their support needs or how they compare to their human relationships is an area for future research. However, married and partnered males with lower to moderate levels of social support were more likely to have a weaker bond with their companion animal. It could be that married and partnered males received the support they required from their wife or partner or place less value in their companion animals' ability to provide the support they need and is an area for future research. To the authors' knowledge, this is the only study which investigates the demographic determinants of companion animal owners who have low to moderate levels of human social support and a strong bond with their companion animal. Such findings are a valuable contribution to the literature, as determining the characteristics of the HAB relationship for single females, as well as the relationship for married and partnered males with their social supports is an area for future research.

A strength of this study is the large companion animal sample from the general population, and in particular its representativeness of the population age range, as many studies focus on samples of young children or older adults. Although the large proportion of female participants could be suggestive of selection bias, many studies into the HAB have similar male to female ratios. Given women are more likely to be companion animal owners

and have been found to have stronger bonds with their companion animals (Martens et al., 2016; O'Dwyer & Thompson, 2018), it could be they are more likely to be interested in completing surveys investigating the HAB. However, future researchers within the field of the HAB should consider the implications of selection bias when designing methodology and aim to find representative samples of the population being investigated (Saunders et al., 2017). The study also improved on methodologies such as using standardized validated measures and reporting nil effects. A particular strength was focusing on which specific subpopulation falls into the category of low to moderate human social support with strong HAB. However, future research may consider examining more demographic factors, such as income, race, and living arrangements, as well as expand the number of groups within the demographic variables and not limit to binary groups, despite this study doing so for ease of interpretation and analysis. Finally, this study provides a foundation for future research that can explore these subpopulations and examine what ways the HAB may differ from human-human supports, and how an individual's companion animal can aid through adversity.

4.2.5.1 Implications for Research Methodology

This study expands on a previous study by Hill et al. (2020) to examine the reported curvilinear relationship between human social support and the HAB and in turn, provides reliable outcomes that can contribute to future research. This study suggests the utilization of mixed method research design within the HAB field of research. For example, using an explanatory sequential design that allows subpopulations of interest to be understood more holistically, and exploring the outcomes of this quantitative study with qualitative research methodology will build upon the outcomes reported (Del Toro & Yoshikawa, 2016; Wisdom & Creswell, 2013). Applying multiple data-collection methods provides credibility and validity to the outcomes of research (Hesse-Biber, 2010; Saldaña, 2013). Given the reported

methodological weaknesses with quantitative research designs within the field of HAB research, the limitations in conducting randomized controlled trials, and lack of longitudinal studies (Brooks et al., 2018; Chur-Hansen et al., 2010), adopting mixed methods may mitigate the limitations of quantitative and qualitative methodology with the strengths of the other and may strengthen the credibility of research outcomes within the HAB literature (Gelo et al., 2008; Turner et al., 2017).

4.2.5.2 Conclusion

The outcomes of this study add value to the human-animal bond literature. This study explored the demographic correlates of having low to moderate human social support and strong bonds with a companion animal, and found that single females are more likely to fit this category. We found that single people, those under the age of forty years, females, and those with high school education or less were more likely to have higher levels of HAB, as well as single people and those with undergraduate degrees and high school education or less were more likely to have lower levels of human social support. Despite the limitations to the study, the strength of a large sample with a varied age range, measuring the strength of the HAB as opposed to companion animal ownership alone, together with the findings, provide a foundation for future research. With this information, future research should expand on these findings with follow-up qualitative studies to explore this subpopulation and determine how human social supports and companion animal relationships compare, as well as understand if companion animals provide aid throughout adversity for those who have a strong bond. As the theoretical framework of this study claims, it is not companion animal ownership alone that may serve as a protective factor, but the strength of the bond that could act as a buffer for adversity.

Chapter 5. Understanding women's relationships with their companion animals and human social supports: a qualitative study examining what aids through adversity

5.1 Statement of Authorship

Statement of Authorship

Title of Paper	Understanding women's relationships with their companion animals and human social supports: a qualitative study examining what aids through adversity
Publication Status	☐ Published ☐ Accepted for Publication ☑ **Submitted for Publication** ☐ Unpublished and Unsubmitted work written in manuscript style
Publication Details	Submitted for publication to *Clinical Psychologist* on 10 February 2021.

Principal Author

Name of Principal Author (Candidate)	Lian Hill		
Contribution to the Paper	Conducted the literature review, developed the aims, designed the study, collected and analysed the data, and wrote and submitted the manuscript.		
Overall percentage (%)	85%		
Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper.		
Signature		Date	09.02.2021

Co-Author Contributions

By signing the Statement of Authorship, each author certifies that:

i. the candidate's stated contribution to the publication is accurate (as detailed above);
ii. permission is granted for the candidate in include the publication in the thesis; and
iii. the sum of all co-author contributions is equal to 100% less the candidate's stated contribution.

Name of Co-Author	Helen Winefield		
Contribution to the Paper	Provided consultation and supervision for the development of the project, data analysis, and report writing; reviewed and edited drafts. (10% contribution)		
Signature		Date	7.02.2021

Name of Co-Author	Pauleen Bennett		
Contribution to the Paper	Provided consultation and supervision for the development of the project, data analysis, and report writing; reviewed and edited drafts. (5% contribution)		
Signature		Date	9.2.2021

Please cut and paste additional co-author panels here as required.

5.2 Paper

5.2.1 Abstract

Objective: The human-animal bond (HAB) has been shown to be comparable in effect to human social support, yet women with stronger HAB have demonstrated lower levels of human social support. This study aimed to explore a sample of women with low to moderate levels of human social support and a strong HAB to understand how their companion animal and human relationships compared, and whether their companion animal impacted their ability to process experiences of adversity.

Method: Seven women participated in semi-structured qualitative interviews. They were asked a series of nine open-ended questions examining their relationship with their companion animal. The data was thematically analysed and quality assurance measures used to maintain rigour.

Results: Four main themes and six subthemes were identified: a) positive experiences with humans, b) negative experiences with humans, c) positive experiences with companion animals, including companion animals offer stronger bonds, fulfil support needs, are family members, benefits outweigh costs, protective factor against suicide, and enhance mental health, and d) negative experiences with companion animals.

Conclusions: Women showed a preference for their companion animal due to their companion animal offering emotional support, however they acknowledged the importance of human social connections for verbal interaction. Companion animals provided significant aid throughout adversity, in particular as a protective factor against suicide. The implications for practitioners providing therapeutic care to individuals experiencing adversity, particularly suicidality, are significant.

Key words: human-animal bond, companion animals, mental health, pets, human social support, suicidality

5.2.2 Introduction

Adverse experiences can have a detrimental impact on mental health which constitutes a significant global disease burden and results in premature death, decreased functioning, and reduced quality of life (Höltge et al., 2018; World Health Organization [WHO], 2018). For Australian women, mental health conditions represent the primary cause of disability; 43% will experience a mental health condition at some point in their lifespan (Duggan, 2016). Research has shown that social support is a protective factor for the impact of adverse experiences and mental health decline, particularly for suicidality (Harris et al., 2019; Herbell & Zauszniewski, 2019; Islam, 2013; Zadravec Šedivy et al., 2017). However, much of the research on the protective capacity of social support focuses on human supports, with limited focus on the impact of the human-animal bond (HAB). Companion animals have been described as central to many people's lives and comparable in effect to human social support (Amiot et al., 2016; Fitzgerald, 2016; Flynn, 2000). Therefore, there is an increasing need to explore women at risk of limited human social support, yet who have strong bonds with their companion animals, to develop an understanding of what characteristics of their relationship aid them through adversity, as well as how that relationship compares to their human social supports.

The WHO (2018) proposed gender as a critical factor for mental health conditions, concluding that women experience higher rates of complaints, and named positive social supports as a main protective factor to reduce the onset and development of mental health conditions. Similarly, Martin, Dixon, and Thomas (2017) determined that mental well-being

depends on our interconnectivity with other humans and the quality of relationships with other persons and community. Social support is broadly defined as including various affirming actions, interpersonal exchanges, and social conditions that are generated within social relationships (Gore, 1985; McNicholas & Collis, 2006; Teismann et al., 2018). Women with strong social support systems have been found to have more positive mental health outcomes, such as lower psychological stress, fewer depressive symptoms and increased resourcefulness, whereas lack of social support or social conflict had a negative effect on mental health (Guruge, Birpreet, & Samuels-Dennis, 2015; Herbell & Zauszniewski, 2019; Islam, 2013). Various forms of social support, such as emotional, instrumental, informational, and appraisal, enabled women to better cope with adverse experiences and enhanced psychological wellbeing (Ahmadi, 2015; Langford et al., 1997; Ma et al., 2016; Suwankhong & Liamputtong, 2016).

The relationship between humans and their animal companions has received increasing attention within the evidence base, in that companion animals may offer something different to human social supports but also that some qualities were shared (Cohen, 2002). Companion animals are reportedly a significant emotional support for women in abusive relationships, especially childless women, and often serve as a substitute for human social supports (Flynn, 2000). Currently, there are approximately 24 million companion animals in Australia, with more than two-thirds of Australian homes having a companion animal (Animal Medicine Australia [AMA], 2016). Therefore, understanding the impact of the HAB and how it compares to human social supports is warranted. For the purposes of this study, animal companionship is defined as an outcome of community-based individuals living with a companion animal with the intention of providing lifelong care and having a relationship based on a series of interactions (Hill et al., 2020). The HAB framework

is based on companion animals providing a supportive relationship in the form of emotional support and buffering which ameliorates the impact of adverse stressors on mental health (Garrity et al., 1989; McConnell et al., 2011; Serpell, 2011).

Women were more likely to have a companion animal, have a stronger bond, and report less complications with them than men (Bao & Schreer, 2016; Cohen, 2002; O'Dwyer & Thompson, 2018; Zimolag & Krupa, 2009). In particular, women were more likely to focus on positive qualities their companion animal provided, such as empathy, unconditional love, a sense of safety and purpose, non-judgmental support, and that their companion animal was less likely to abandon or hurt them (Cohen, 2002; Kabel, Khosla, & Teti, 2015). Furthermore, women identified the importance of companion animals being a valued family member who offers emotional support; in particular women expressed the reciprocity of the HAB relationship, that pets were reliable listeners, and aided owners through adversity (Fitzgerald, 2016; Fraser & Taylor, 2017; Risley-Curtiss et al., 2006; Wiens, Kyngäs, & Pölkki, 2016). In particular, Shir-Vertesh (2012) found Israeli couples viewed their companion animals as family members who gave and received love similar to small children.

Companion animals have been considered to provide aid throughout adverse experiences (Krause-Parello, 2012). For example, during experiences of grief, widowed women who had a companion animal experienced less loneliness; the continuity of their companion animal during the mourning period was a significant factor, particularly when human social supports ended (Sable, 1991). Fitzgerald (2016) found abused women saw their companion animals as a reason to live and helped them cope with the adversity in the form of social support as a protective factor. Despite these findings, it is unclear what the function of

the companion animal is to women with low social support and a strong bond with their companion animal, and how that compares to their human relationships.

Understanding the relationship women have with their companion animal(s) may enhance the therapeutic experience for those that seek help to cope with adversity. Frequently, the impact of the HAB is not considered when undertaking mental health assessments, whereas understanding the HAB relationship could aid with client-therapist rapport building and provide insight into how clients establish and bond with other significant social supports, as well as how they engage in the therapeutic process (Arkow, 2019; Hill et al., 2020; Sable, 2013). Therefore, the aims of this study addressed the WHO's (2018) recommendations for improving women's mental health outcomes, such as providing evidence on possible protective factors for mental health conditions and generating research outcomes that can enhance the competency of health care providers to treat mental health conditions in women. This study's objective was to investigate women's strong bonds with companion animals and determine the characteristics of when and how the human-animal bond may be of value. In particular, this study sought to explore and understand the mechanisms of a strong human-animal bond in women with low to moderate perceived human social support and how the HAB and human social supports compare, as well as describe the impact of the HAB on women's ability to process adversity.

5.2.3 Method

5.2.3.1 Participants

Seven participants were all community-dwelling female companion animal owners (18 + years) recruited from a cross-sectional study exploring the relationship between animal companionship, perceived human social support and resilience (see Hill et al., 2020, for full

methodology). All participants were purposively chosen for characteristics relevant to the research question, were self-reported primary carers for their companion animal and reported low to moderate levels of perceived human social support (measured by the Multidimensional Scale of Perceived Social Support, MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988; with low to moderate levels equivalent to scores ranging from 1-5 out of a possible 7, as high levels would be from 5.1 to 7) and moderate to strong relationships with their companion animal(s) (measured by the Lexington Attachment to Pets Scale, LAPS; Johnson, Garrity, & Stallones, 1992; scores ranged from 30 to 90, with higher scores indicative of higher levels of HAB). All pet types were considered in the scope of the study, however participants interviewed were either dog (5) or cat (2) owners. See Table 1 for demographic information and survey scores of participants.

Table 4. Demographic information and survey scores of participants (*n* = 7)

Pseudonym	Age	Education	Type of Residence	No. of People in Home	Marital Status	Pet Type	Human Social Support	Strength of HAB (range 30-90)
P1	25-29	Grad. Cert/Diploma	House with garden	2	Married	Dog	Moderate	82
P2	55-59	Bachelor's degree	House with garden	1	Divorced	Dog	Low	87
P3	50-54	Grad. Cert/Diploma	House with garden	2	Domestic Partner	Dog	Moderate	85
P4	30-34	High School complete	House with garden	3	Domestic Partner	Dog	Moderate	90
P5	30-34	High School incomplete	Unit with garden	1	Single	Cat	Moderate	86
P6	25-29	Grad. Dip/Hons Degree	House with garden	2	Single	Dog	Moderate	85
P7	55-59	Grad. Dip/Hons Degree	House with garden	2	Married	Cat	Moderate	88

5.2.3.2 Procedure

Ethics approval was granted by the relevant institution's human ethics committee. Participants from Hill et al. (2020) who provided contact details and expressed interest in participating in future research about the HAB were contacted by the researcher to discuss participation in an interview study about their relationship with their companion animal, particularly during times of adversity. An information sheet and consent form were distributed to participants, and on receipt of the signed consent form an interview date and time convenient to the participant was arranged.

Semi-structured interviews were conducted face-to-face and via telephone and digitally audio-recorded for the purpose of transcription, then downloaded onto a password protected computer. Each interview began with thanking the participant and providing a structure for the interview, ensuring consent was understood and granted. Participants were asked a series of nine open-ended questions investigating their relationship with their companion animal in comparison to family and friends, such as "How does your relationship with your pet compare to other relationships you have with your family and/or friends?". They were also asked to reflect on a specific time of adversity and describe how their pet impacted their ability to process such challenges. Participants were encouraged to answer candidly, with follow up questions and prompts used to ascertain more detail, such as "Can you provide an example?". Following the semi-structured interview questions participants were asked, "Is there anything else you would like to add?". Interviews lasted approximately 20-30 minutes and were transcribed verbatim by the researcher.

5.2.3.3 Data Analysis

Inductive Thematic Analysis was used to code the data and develop related themes following Braun & Clarke's (2013) six-step protocol. The six-stepped approach included: 1) transcription of interviews, 2) reading and familiarisation with the transcripts' content and noting items of relevance related to the research question, 3) coding the data, 4) searching for themes within the codes, 5) reviewing themes and potential subthemes and developing a 'thematic map', and 6) defining and naming the themes. An inductive approach uses disciplinary knowledge and epistemology to generate themes from the data, and not existing theory alone. Data analysis was undertaken by the first author (a female, Caucasian, cat owner), who kept a reflexive research journal throughout the research process to avoid and/or reduce the influence of potential biases on the results through an auditing process (Braun & Clarke, 2013; Tracy, 2010). The researcher's values, assumptions, and perspectives were critically reflected upon and whether these could have influenced the collection and analysis of data, and related outcomes (Braun & Clarke, 2013).

Data comprised of the transcribed interviews with each participant. The thematic analysis process coded the data based on content related to the research question, these codes were then grouped into themes based on recurrent patterns. Themes were identified semantically, which took into consideration the participants' descriptions and experiences. The second author and analyst determined consistency in themes and consensus was established via discussion between both reviewers. No further interviews were conducted when it was clear that there was saturation of the data themes. Member checking was undertaken by sending a copy of each participant's transcript to them, as well as a written draft of the analysis, for their review and request for comments on the authenticity of the researchers' interpretations. The aim of member checking was to ensure the participants' views and experiences were accurately interpreted and represented, while still allowing for

the researchers' interpretative analysis. There were no amendments to the data or outcomes based on the member checking process.

5.2.4 Results

Four main themes were identified within the data, 1) positive experiences with humans, 2) negative experiences with humans, 3) positive experiences with companion animals, and 4) negative experiences with animal companions. The third theme that recognised positive experiences with companion animals, was further categorised into six subthemes (see Figure 1).

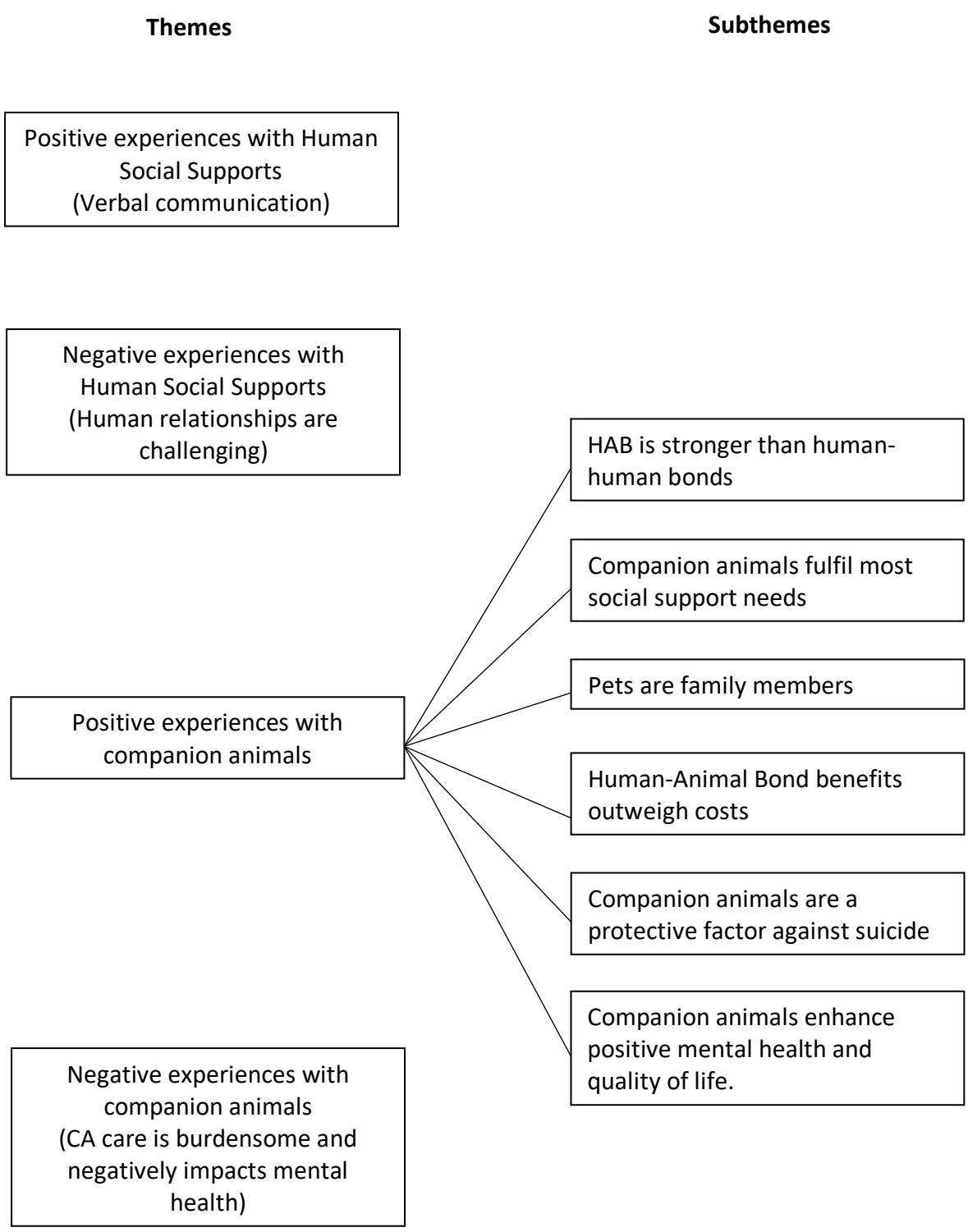

Figure 3. Thematic map of the experiences of women with low to moderate social support with their companion animals.

5.2.4.1 Theme 1: Positive experiences with humans

Participants acknowledged that human social supports were important in their lives as they offered certain strengths, such as verbal input in the form of advice giving that companion animals are unable to do. Some participants acknowledged that a range of forms of support are needed to repair and recover.

> *Obviously human relationships are really important (P3)*

> *…talking to my dog she's not the greatest at giving advice so…that's kind of where you need your family to step in and my family step in when they can. (P6)*

5.2.4.2 Theme 2: Negative experiences with humans

When asked to discuss how their human social support relationships and companion animal relationships compared, participants reported that human relationships are often challenging. They felt human relationships carried expectations, such as having to behave in appropriate ways suitable to societal norms, resulting in relationships feeling conditional and effortful.

> *One on one relationship you don't always get the opportunity to express yourself um quite often you might be in a bad space yourself but…whoever you're with is needing to be heard…so you might come away from that interaction feeling more burdened than you were before. (P7)*

Whinging negative people can be very challenging, uhm, and they can drag you down with their negativity. Dogs just aren't like that, they're always usually quite positive (P2)

Furthermore, several participants viewed humans as untrustworthy and uncaring in their human relationships.

I feel like you could leave, and the humans would just get over it (P3)

In my personal life I don't feel a lot of that trust (P6)

The love I have for these two dogs is ridiculous um they are more human than a lot of humans that I deal with (P4)

5.2.4.3 Theme 3: Positive experiences with companion animals

The positive reactions participants described having towards their companion animals were significant, with six subthemes identified in this area.

Subtheme 1: Human-animal bond is stronger than human-human bond.

Most participants described a stronger bond with their companion animals and reported that their human social supports were unable to meet their needs in the same way their companion animal could.

The relationship with your pet is kind of stronger because you are with them so much more. So, I guess I have had friends who have helped me through shitty times, but the pet is always there and that definitely helps. (P3)

It means almost as much as having a sister to me because I don't have the closest relationship with my sisters, but he's done for me emotionally and socially more than any of my friends or sisters have ever done and you know when we were overseas the only thing I wanted to come home for was not to see my family...to see my dog because at the end of the day he's never mistreated me or gotten angry at me (P1)

Subtheme 2: Companion animals fulfil most social support needs.

One of the most frequently expressed positive characteristics about participants' relationship with their companion animals was the unconditional love they received. Participants described their companion animal as non-judgemental and loyal, in that they believed their companion animal would be less likely to abandon them than those in their human relationships.

There was unconditional love there at all times even if I had yelled at him for weeing everywhere…there's never any judgement, he never talks which kinda helps, you can sit and talk at him and imagine he's listening. (P1)
She's always there for me, she's that companion that I can trust and she's that…dog that I can tell all my secrets to…and she's just always there

and…that's, you know and, short of something horrible taking her away from me, she's not gonna leave me which is another nice feeling. (P6)

For the majority of participants, the physical proximity and emotional closeness was described as a benefit, as well as the consistency of these characteristics.

Life is just a lot more positive, you know, if I have a terrible day at work I literally go home and lay on the …rug and he walks all over me and licks my face and my toes…it's just, it's great fun, you can have a really shit day and you come home and that, and you just feel so much better…soooo much better…like the other day I was in the shower and I was crying and had a really awful day at work and…I opened the door to get some shampoo and he came up to me…(P1)

Participants communicated a sense of reciprocity with their companion animal, and believed that their companion animal helped them as much as they helped their companion animal. For example, their companion animal provided comfort, love, and a sense of responsibility, and in return they fed and nurtured them.

…they love you, the unconditional love you know, the way that they rely on you and that…it's really a small thing, but like sleeping at the end of my bed, it's cute…they're just so lucky and they don't realise it and without

meaning to, they like repay us back with the love and the companionship. (P5)

Additionally, participants described their companion animals as being reliable, good listeners, and that their human-animal relationship was non-complex, relaxing and simple.

I talk to the cat and he doesn't answer back, he just lies there and looks at me ((laughter))…there's no judgement, so it doesn't matter what I say. (P7)

she's less demanding, she doesn't need a lot from me but gives me a lot… she's more reliable, yes, she's more reliable (P3)

Subtheme 3: Pets are family members

Many participants emphasised how integral their companion animal was to their family, identifying them as another family member. Several participants likened and referred to their companion animal as a child substitute.

…I treat him like my kid, cause like I'm forty-two and I don't have any children. So, um, he's like my best friend and my kid…I love him". (P5)

Subtheme 4: Human-animal bond benefits outweigh costs

All participants emphasised the joy they experienced from being a companion animal owner and they had no regrets in bringing a companion animal into their lives.

> *It probably wasn't the wises choice for me um like it wasn't really great timing or anything but um I definitely don't regret it at all and he has improved my life a hundred percent (P4)*

Most participants experienced a desire to make their companion animal happy, and many describe a willingness to sacrifice their own needs for their companion animal.

> *I treat them more human than people would treat their dogs, and you know, they've got a better bed than I offer my guests, sometimes…there's never too much money to spend on these two…I'm making sure they're comfy and that they're alright before myself…I would give them the food off my plate before I would even eat. (P4)*

They viewed it as an owner's responsibility to care for and train their companion animal, as well as needing to protect them.

> *I can't always just get up and leave to go away and stuff, I always have to consider him…. you know it's a responsibility in life. (P5)*

Subtheme 5: Companion animals are a protective factor for suicide

There was an overwhelming response from all participants that companion animals were able to provide aid during times of adversity. Participants described their companion animals having an empathic response and relatability towards them during challenging experiences. Several participants reported their companion animal enabled them to put their life in perspective and enjoy the "little things".

> *So walking with them, you know…it's seeing them just so carefree and so excited about going for a walk, you know, the little things in life that remind you that you don't need to stress the big stuff…they've brought me so much happiness just being in my life. (P4)*

Many women also described their companion animal as providing them with a as a protective factor against suicidality.

> *I really felt like falling in the hole, and at that time I was feeling suicidal, you know, you can't, there's someone there that needs you, and at that time I thought no one needed me that much. (P3)*

> *She's always an ear to listen or I can just, you know, hug her and cry with her and talk to her and I guess, no, she can't give me advice, but as I say, eventually…she keeps me alive because if I have a mental breakdown, and then I'm, you know, wanting to, um, hurt myself, or, um, stop the pain and just not want to be here anymore, on other words, if I wanted to commit suicide, well, I won't because she's left on her own and then, um, and*

she's kind of my dog and very much almost a one person dog and so, who would look after her. (P2)

Subtheme 6: Companion animals enhance positive mental health and quality of life.

Participants appreciated the ability of their companion animals to add to their quality of life. Participants reported their companion animal provided emotional support and subsequently aided in emotional regulation. This was through various modalities, such as providing empathy, a sense of self-worth, providing consistency in routine, the owner feeling needed and valued, and providing an external focus instead of a negative internal focus.

When we got him, it made the healing process a lot easier that had I not had him…every time I got sad he'd come up and be like "let's be sad together" and sit with me. (P1)

It's been one of the most, it's been one of those positive experiences, not only because she's given me so much routine and love and stability, but also because she's just always there and I love that so much about her. (P6)

Even if you're in a bad mood, they actually break that…they can break the cycle, like that anger and depression and anxiety cycle, they can break that, uhm, just by being there and bring you back into the present. (P2)

Many of the interactions with companion animals and related outcomes were synonymous with characteristics of behavioural activation, in that they provided a sense of purpose.

> *She made me do things, she needed things from me, and I had to make sure those things got done, there was no option to just fall into a hole and do nothing. So, she had to go outside, so I had to go outside, she needed a walk, so I had to walk her, she needed feeding and I had to do those things, which is really important when you feel like you are falling in a hole. (P3)*

5.2.4.4 Theme 4: Negative experiences with companion animals

Participants were not likely to discuss the negative experiences with their companion animals until asked during the interview. Participants reported that companion animal care can be burdensome and negatively impact mental health. For example, the challenges associated with training their companion animal to have appropriate behaviours could compound existing mental health difficulties.

> *Sometimes when I was really down…and things like his toilet training which probably was the hardest thing we had to experience…when that sort of was not going well and then I wasn't going well at the same time that was hard to sort of process together…and I'd just think "I had a really awful day, and my friends have just left me and now I have to deal with you and this…" (P1)*

Most participants discussed the language barrier between their companion animal and themselves, explaining that their companion animal was unable to provide them with verbal advice in relation to adverse experiences.

> *With the language barrier he can't understand when I'm telling him… they didn't help me understand it, but they helped me get through it, they helped me feel better. (P5)*

Other negative experiences with companion animals included the difficulty of travelling due to the need to find care for their companion animal.

> *Travel is a big one, you know I can't…cause I live up here by myself and I don't have any family that come and feed my cats while I'm gone, unless I can take them with me, I can't go anywhere for very long…I know that there are those places where you can take them to that are like a hotel for cats, and they look after them while you're gone, but I don't feel right leaving my pets there…they're my children, like I wouldn't just leave my kids at ((laughter))…like, you know what I mean? (P5)*

5.2.5 Discussion

The current study explored and found four themes and six subthemes about how women with low to moderate perceived human social support and stronger HAB compared their companion animal and human relationships, as well as investigated the resources offered by companion animals during experiences of adversity.

5.2.5.1 Positive and negative experiences with humans

Supporting previous research (Amiot et al, 2016; Boa et al, 2016), women in this study considered human social supports to be important in their lives. One specific aspect of human social support was the ability to have verbal communication, particularly in the form of advice giving, that women believed they could not experience with their companion animals. Furthermore, women recognised that a range of support was required when recovering from adversity, which supports findings from the literature that different elements of social supports, such as emotional, instrumental, informational, and appraisal, better enable women to cope with adverse experiences (Suwankhong and Liamputtong, 2016; Ma et al., 2016; Ahmadi, 2016; Langford et al, 1997). However, despite acknowledging the importance of human social support, women in this study failed to mention any other type of support offered by their human social supports. These findings suggest that women value verbal interaction with human social supports to enable them to feel understood when experiencing adversity, rather than rejecting verbal advice as too demanding and less supportive (Karen, 2000).

Although the literature indicates that human social support could increase wellbeing and reduce mental health decline in women (Herbell & Zauszniewski, 2019; Islam et al, 2015), the findings from this study focus on the value of informational support in the form of advice giving, mentorship, and practical guidance, with no mention of other elements of human social support, such as emotional, instrumental or appraisal (Langford et al, 1997). Women also felt their human social support relationships presented challenges, including having expectations and being conditional. This may be an indication that there are core social support needs not being met by their human relationships. For example, emotional support such as trust, feeling valued and cared for may not be provided by their human

supports. Otherwise, it could be women's negative experiences with human social supports are due in part to individual differences in personality such as introversion, shy temperament, or pathologies such as social anxiety that leads to their lower levels of perceived human social support.

5.2.5.2 Positive and negative experiences with companion animals

Overall, women described positive experiences with their companion animals. Women preferred their relationship with their companion animal over their human relationships, which supports previous findings in literature (Fitzgerald, 2016; Irvine, 2004). Qualities provided by the companion animal relationship included unconditional love, non-judgemental, reliable, being a good listener, reciprocity, loyalty, physical proximity, comfort, sense of responsibility and purpose, and continuity of presence. Many of these findings support the evidence within the literature base (Labrecque et al., 2015; Kabel et al., 2015; Fitzgerald, 2016). Furthermore, women saw their companion animals as family members, and for some women as a child substitute, which also supports findings from other studies (Fraser & Taylor, 2017; Shir-Vertesh, 2012). However, women's account of how they would make sacrifices for their pet, such as food, travel and social life, and the importance of care and protection of their companion animal are novel contributions to the literature. Such positive experiences and strong bonds towards companion animals suggest that, particularly for this sample of women for low to moderate social support, women rely on their companion animals to fulfil many aspects of support. Moreover, these findings indicate that women are not devoid of providing social support, however given the potential lack of reciprocity they experience in their human relationships, they bestow such qualities to their companion animals.

Many of the women interviewed described their companion animal as a protective factor against suicidality, providing support for similar findings that found companion animals provided a reason for living (Fitzgerald, 2016). Furthermore, there was a strong theme that companion animals provided aid during adversity by offering empathy and relatability, similar to previous findings (Sable, 1991; Fitzgerald, 2016; Krause-Parello, 2012; Labrecque et al., 2015; Kabel et al, 2015). However, an original contribution to the literature is that women believed their interactions with their companion animal provided them perspective and enabled them to enjoy more simple qualities in life. Companion animals were reported to improve quality of life, by providing emotional support and regulation, routine, a sense of self-worth, and an external focus of attention as opposed to internal rumination. Again, these findings support the literature (Boa et al., 2016; Arkow, 2017; Fraser & Taylor, 2017), which suggests that the relationship women have with their companion animal could provide a therapeutic tool or adjunct to therapy to enhance wellbeing. These findings offer support that companion animals provide something absent from human social support relationships for women with low to moderate human social support.

Women expressed several negative impacts of their relationship with their companion animals, such as difficulties with training and negative behaviours, which were viewed as burdensome and compounded mental health concerns. Such findings are supported in the literature that associates the HAB with negative mental health, particularly for those with lower levels of human social support and strong HAB (Antonacopoulos & Pychyl, 2010; Parslow et al., 2005; Peacock et al., 2012). However, women mostly reported that these experiences were worth the benefits they received in return from their companion animal. Furthermore, women's inability to converse with their companion animals about experiences of adversity, meant that although they felt emotionally understood and accepted by their

companion animal, they did not feel conceptually understood. Overall, women's descriptions of their negative experiences with their companion animal contribute to 'why' there may be evidence of a negative relationship between HAB and mental health found in previous research, which had not been previously explored.

5.2.5.3 Strengths and limitations

A particular strength of this study is the rigorous qualitative methods and employing the quality assurances as suggested by Tracy (2010). In addition, the age range of women was representative of companion animal owners and investigated a sample of women not commonly captured in the HAB field of research. Furthermore, to the author's knowledge, this is the only qualitative study exploring a sample of women who have low to moderate levels of human social support and strong HAB and compared their experiences with their human and companion animal relationships. Although this study did not look at specific forms of adverse experiences, such as loss, grief, or abuse this could be an area of investigation for future research. Women were asked to report on only one 'primary' companion animal when some owned more than one, therefore the number of pets owned and whether that influences mental health outcomes could be an area for future research. Lastly, future research may take into account and expand on negative experiences of caring for a companion animal and determine whether challenges can compound or exacerbate psychopathology.

5.2.5.4 Clinical Implications

The strength and nature of the HAB should be explored in mental health assessment and treatment. Mental health practitioners should assess the risk and protective factors of the HAB, such as determine which qualities of the companion animal relationship that could

contribute to treatment and enhance wellbeing, or alternatively, uncover aspects of the relationship that are compounding presenting issues or provide limitations for therapeutic engagement. For example, an individual's companion animal may provide routine, purpose, and external focus that contributes to therapeutic interventions such as behavioural activation (Kanter, Puspitasari, Santos, & Nagy, 2012). Furthermore, practitioners need to consider how the care needs of the companion animal impact during times of adversity. These findings are of significant importance to psychologists, particularly since there is limited training and professional development focused on the HAB.

5.2.5.5 Conclusions

Despite the potential limitations, women showed a preference for their companion animal relationship over that of human social supports and have companion animals that act as an aid through adversity, as well as a protective factor against suicide, meaning that the outcomes of this study add value to the HAB literature. The strength of the HAB may contribute certain aspects of human social support, such as emotional support, and subsequently act as a buffer through adversity. The implications for practitioners providing therapeutic care to individuals experiencing adversity, particularly suicidality, are significant. The strength and nature of the HAB should be inclusive in the mental health assessment process and considered when conceptualising diagnoses and formulating treatment plans. Finally, future research may further explore the negative experiences of caring for a companion animal and the impact on mental health outcomes.

Chapter 6. Discussion

6.1 Preamble

By implementing a mixed methods research design this thesis and conducting a series of quantitative and qualitative studies, this thesis provides comprehensive outcomes related to the relationship between the human-animal bond (HAB), human social support and resilience. Furthermore, this thesis provides insight to a subpopulation of women who were most likely to have low to moderate levels of human social support and strong HAB, determines how their human and companion animal relationships compared and how their companion animal impacted their ability to cope with adversity. The following chapter summarises the findings from the three studies undertaken, highlights what the findings contribute to both the literature and clinical practice, as well as discusses the implications of the outcomes. Lastly, this final chapter considers methodological strengths and weaknesses, and suggests ideas for future research.

6.2 Summary of Findings

Based on gaps within the literature, this thesis intended to take a strengths-based approach to investigating the HAB, human social support and resilience, a construct not previously explored within the HAB field of research. Each study within this thesis builds upon the findings of the previous study and aimed to further the HAB research by conducting a methodology not frequently used within the field, namely mixed methods.

6.2.1 A curvilinear relationship between the HAB and human social support

Study One (Chapter 3) conducted a comprehensive cross-sectional study that aimed to explore the relationship between the HAB, perceived human social support and resilience by

assessing whether the HAB could moderate the impact of social support as a protective factor for resilience. This study found the HAB does not moderate the relationship between perceived human social support and resilience, and therefore does not enhance resilience in individuals with low human social support. Contrary to findings that the HAB successfully acts as a moderator for low social support and mental health related outcomes (Bryan et al., 2014; Siegel et al., 1999), this study considered the proposal by Chur-Hansen et al. (2009) that the lack of evidence may partly be due to the curvilinear relationship between the strength of the HAB and mental health outcomes such as perceived human social support. Study One found there is a curvilinear relationship between the strength of the HAB and human social support, which suggests very weak or strong bonds may be correlated with a reduced capacity to build resilience and cope with adversity due to lower levels of human social support. Alternatively, individuals with a stronger HAB may feel their companion animals meet their support needs and do not see additional value in more human support, and therefore do not have a reduced capacity to build resilience. Similarly, those with weaker HAB and low to moderate human social support may consider their support needs met by their human social connections and also not necessarily have reduced capacity for resilience.

Study One also found there were no differences in levels of resilience between companion animal owners and non-owners, which suggests the human-animal bond does not add to human-human relationships although it may offer specific characteristics of social support, such as emotional support (Meehan et al., 2017; Serpell, 2011). This study also found that human social support was significantly associated with resilience, which means individuals with higher levels of perceived human social support were more likely to have higher levels of resilience. This finding supported previous literature showing that perceived

human social support is a protective factor for resilience (Pejicic et al., 2018; Southwick & Charney, 2018).

6.2.2 Single females with low to moderate human social support and strong HAB

Study Two (Chapter 4) is a descriptive, exploratory study which expanded on Study One with the aim of exploring the curvilinear relationship between human social support and the HAB (Hill et al., 2020). This study was phase one of a two-phase approach with follow-up exploratory design undertaken as part of the thesis and specifically investigated the companion animal owner subsample from Study One's dataset. Firstly, the study aimed to determine whether there were any differences in the demographic characteristics, such as age, marital status, gender and education level, on levels of the HAB and human social support. Secondly, this study aimed to investigate which of those demographic characteristics best predicted the HAB when those factors interacted with human social support, and therefore determine which subpopulation that was mostly likely to have low to moderate levels of perceived human social support and stronger HAB.

Study Two found people who were single, those under the age of forty years, females, and those who had completed high school education or less were more likely to have stronger levels of HAB. These findings were contrary to many previous findings that did not find any statistical difference in demographic factors and the HAB (Quinn, 2005; Stallones et al., 1990; Zilcha-Mano et al., 2011). However, it did support the literature that females had stronger bonds with their companion animals (Johnson et al., 1992; Martens et al., 2016; O'Dwyer & Thompson, 2018). Some reasons for such discrepancies could be related to cultural differences or the subpopulations of study: this study did not examine a targeted sample but a large Australian community sample which may be considered fairly

representative of the general population. Furthermore, it was found that married people were more likely to have higher levels of human social support than single people, which supports previous findings (Antoncopolous et al., 2010). One particular original finding from this study was that companion animal owners with high school education or less or undergraduate degrees were more likely to have lower levels of human social support than those with post graduate degrees. It seems that those with post graduate degrees have strong support networks that they perceive to meet their support needs.

Lastly, while controlling for demographic influences Study Two found single females with low to moderate levels of human social support were more likely to have a stronger HAB, whereas married/partnered males with low to moderate human social support had the lowest levels of the HAB. In relation to the curvilinear relationship between the HAB and human social support, these are the two subpopulations of companion animal owners with low to moderate levels of social support: single females and married/partnered males, who are at risk of lowered resilience and more likely to be impacted by mental health decline, and therefore potentially a more vulnerable group. It could be that single females feel their companion animal(s) meet their social support needs and therefore do not seek out further support, or alternatively are over-reliant on their companion animal due to being mistrusting of others or lack social skills which in turn may limit their social support or ability to connect with others. However, married/partnered males may have limited support needs and/or feel their support needs are met through their human social supports such as their wives and partners and do not have a need for additional support, and therefore have not developed an emotional bond with their companion animal (Jensen, Rauer, & Volling, 2013; Xu & Burleson, 2001). Alternatively, there is the possibility of male response bias and these

findings are not wholly representative of the relationship males have with their companion animals (Blazina, O'Neil, & Denke, 2016).

6.2.3 The HAB is stronger and a protective factor against suicide

Study Three (Chapter Five) contributed the second phase of the two-phase follow-up exploratory mixed methods design of the thesis and expanded on Study Two by conducting semi-structured qualitative interviews. The aims were to compare human social support relationships and companion animal relationships, particularly in women with low to moderate human social support but strong HAB, and explore how their relationship with a companion animal impacted their ability to cope with adversity. The findings in this study were novel as the comparison of human and companion animal relationships had not been previously explored, nor had the sample of women with low to moderate levels of human social support. This study found that women believed their human social supports were important in their lives because they were able to provide verbal support such as advice giving, however they often felt human relationships were challenging and conditional. For example, they claimed other humans could be untrustworthy and uncaring. Given the lower levels of human social support reported and description of human relationships being difficult to rely on, this group of women potentially belong as part of a vulnerable group.

Participants described many positive aspects to the human-companion animal relationship, such as the HAB being stronger than human bonds, companion animals being able to fulfil most support needs and being synonymous with family members, owners sacrificing fulfilment of their own needs for their companion animals', and companion animals being a strong protective factor against suicide due to enhancing positive mental health and quality of life. Many of these findings provide support for previous findings

(Fitzgerald, 2016; Fraser & Taylor, 2017; Irvine, 2004; Shir-Vertesh, 2012), however the women's sacrificial stance was an original finding within the literature, which also appeared to be connected to having reciprocity within the human-companion animal relationship. There were some negative experiences with companion animals, such as behaviour training being burdensome and compounding pre-existing negative mental health issues. Such findings support previous literature that associates the HAB with negative mental health, particularly for those with lower levels of human social support and strong HAB (Antonacopoulous et al., 2010; Peacock et al., 2012; Paslow et al., 2005). Other negative aspects to the human-companion animal relationship were the language barrier and the companion animal not being able to offer advice during adverse experiences, as well as limitations placed on travelling when owners struggled to find appropriate care for their companion animal.

Using a range of methodological designs to achieve robust and valid outcomes, the findings highlight a need for a more frequent application of mixed methodology within the HAB field of research, as well as the translation of research findings to psychologists and other allied health professionals. The outcomes from this thesis can assist in building greater awareness of the impact of the HAB, how it may contribute to diagnoses and/or therapeutic intervention, and how it may serve as a protective factor against suicide. More details of such implications of these findings will be further discussed below.

6.3 Contributions to the literature

The findings from all three studies make a significant contribution to the HAB literature by adding to the knowledge and understanding of women companion animal

owners, as well as contributing to clinical training and practice, research and professional development in the field of mental health.

6.3.1 Contribution to the HAB literature

This thesis contributes to the HAB literature by taking a strength-based approach to improve mental health outcomes as opposed to a problem-oriented approach mainly found within the literature (Windle, 2011). Not only has resilience not been previously studied in the context of the HAB, but reporting nil effects is an additional contribution to the HAB literature and aids the development of future research. Furthermore, this thesis contributes an understanding about the strength of the HAB and subsequent relationships women have with their companion animals which encourage positive coping skills despite exposure to adverse experiences and risk, helping them build on strengths and develop competency that are associated with positive health outcomes (Windle, 2011; Fergus & Zimmerman, 2005; Lemay & Ghazal, 2001).

The HAB has been denoted throughout the literature as a complex bond, not unified in its methodology and theory, and further complicated by use of ambiguous terminology (McCardle et al., 2011; Hosey & Melfi, 2014; Esposito et al., 2011). However, this thesis has based the research findings on a solid theoretical framework that is the strength of the HAB, taken account of and improved upon methodological weaknesses in cross-sectional studies, and specifically designed the mixed methodology of the thesis in an effort to provide a more in-depth understanding of the complexities of the bond. This thesis also adds to the HAB literature by investigating alternative explanations as to how outcome measures are interpreted, such as finding a curvilinear relationship between the HAB and human social support (Hill et al., 2020). Therefore, inconclusive findings within the HAB research may be

due to the variation in and interpretation of measures (i.e. assumed linearity) that investigate the strength of the bond within the companion animal relationship.

Despite a plethora of descriptive studies investigating the HAB and mental health outcomes, there are limited descriptive studies investigating the demographic determinants of the HAB. This thesis establishes new evidence within the HAB literature that single females with low to moderate human social support have the strongest HAB, whereas married/partnered males with low to moderate social support have weakest HAB. These findings build upon previous literature that suggested the effect of the HAB, and any potential benefits, may be specific to selected population groups (Stallones et al., 1990; Herzog, 2011). Therefore, determining specific population groups by using a robust theoretical framework, clear definitions and rigorous methodology could unify researchers' approaches in future research.

Lastly, this thesis provides insight to the relationship women with low to moderate social support have with their companion animal. A novel finding that contributes to the literature is how women showed preference towards their companion animal. Furthermore, the findings from this thesis extends the HAB literature base with the exploration of women's experiences with their companion animal while they process adversity. It adds to previous research that investigated target samples, such as grieving widows, elderly women, and abused women (Fitzgerald, 2016; Krause-Parello, 2012; Sable, 1991), by exploring a targeted sample of women with low to moderate human social support.

6.3.2 Contribution to the HAB research methodology

The mixed methods design undertaken within the thesis contributes an alternative approach to the research methodologies most frequently undertaken by HAB researchers. The thesis was designed to include two quantitative studies and one qualitative study with each individual study's outcomes contributing to both the research questions and subsequent methodological design of the following study. According to Saldana (2013), using a mixed methods design provides credibility and validity to the outcomes. Researchers utilising mixed methodology may generate more in-depth outcomes, provide clarity and expand on quantitative results to produce more holistic findings (Wisdom & Creswell, 2013).

Furthermore, this thesis' aim to address methodological issues within the cross-sectional study design of Study One was a strength for the HAB field of research which has been considered to have weaknesses in methodology (Chur-Hansen et al., 2010; Brooks et al., 2018; Herzog, 2011). Study One was rigorously designed to include a large representative sample, used standardised measures, reported nil effects, and included a control group. The use of a subset of Study One's data for Study Two provides credibility to the outcomes for Study Two due to the rigorous methodology undertaken for Study One. By utilising thorough research designs, it improves the credibility of the findings that contributes to the HAB literature, and in turn contributes suggestions for future HAB researchers to improve cross-sectional study methodology.

6.3.3 Contribution to social support literature

The outcomes from this thesis highlight that there may be essential components of human social support required to meet the needs of those with low social support that the HAB is unable to fulfil. Previous research by Cohen & Lemay (2007) suggested social support as a unique role in how individuals interact with others, and results from a conceptual

analysis by Langford et al. (1997) supported past findings which found four main defining attributes of social support: emotional, instrumental, informational, and appraisal. The findings from this thesis contribute to the social support field of research by highlighting that the HAB may be able to fulfil some elements of support, such as emotional support by providing comfort and a sense of purpose. However, the HAB does not seem to provide instrumental or informational support. Furthermore, it appears that not all elements of social support are provided by human social supports for women with low to moderate social support, subsequently lowering their supports and leading to them being a more vulnerable group. Given that human social supports cannot contribute to all elements of social support for those with low to moderate social support, investigating other attributes of social support for those with lower levels of support is an area for future research. Isolated and non-help seeking individuals are at risk of suicide and suicidal behaviour (WHO, 2014), and fostering positive social connectedness among others has been suggested as a prevention strategy. This thesis contributes that a strong HAB with a companion animal contributes as a protective factor against suicide by way of providing an element of social connectedness, but also suggests an area for future research by human social support researchers to investigate other key psychosocial protective factors for those with low to moderate social support.

6.4 Implications of the findings

The findings from this thesis have implications for clinical and research training, as well as clinical practice for mental health professions. Furthermore, there are implications for researchers within the HAB field of research to improve upon methodology.

6.4.1 Implications for clinical training

Mental health professions such as psychologists may pay little attention to the companion animal relationship (Herzog, 2011), however this may in part be due to the little emphasis placed upon it as part of clinical training, if any at all (Walsh, 2009). Clinical practice educators should consider emphasising the importance of the role companion animals have in the context of the HAB as a mental health construct, when teaching about psychosocial risk and protective factors to students. For example, evidence from this thesis highlights that companion animals can be a support during adversity for the specific population of women with low to moderate social support. However, it is imperative that research outcomes are translated to clinical practice, particularly early on in a practitioner's career when they can develop an awareness of the companion animal relationship and integrate it into future clinical practice.

6.4.2 Implications for clinical practice

The findings from this thesis highlight important implications for psychological therapy. In the delivery of mental health care clinicians should consider the strength and nature of the companion animal relationship when collaboratively engaging, assessing, and treatment planning with clients, in particular with a potentially vulnerable group such as single females who have low to moderate perceived human social support and strong HAB. Clinicians should also consider how the care needs of companion animals impact clients during times of adversity as clients presenting for therapy are already experiencing challenges or adversity which has motivated them to seek therapeutic help. Findings from Study Three, that there can be negative experiences in caring for a companion animal, are of particular importance to psychologists as such negative experiences could cause, compound, or contribute to mental health concerns.

According to Windle (2011), individual assets and protective factors could be enhanced via improved services and treatments/intervention, with the aim of improving health and well-being for those facing stress, adversity and trauma. The findings from this thesis highlight that treatment could be improved by acknowledging both positive and negative aspects of the role of companion animals in individuals' lives. Moreover, companion animals may encourage engagement in psychological interventions as a valued, positive social support, such that an individual may be able to draw on that supportive relationship when experiencing adversities and related psychopathology. For example, as found in Study Three, an individual's companion animal may provide routine, purpose, and external focus that contributes to therapeutic interventions such as behavioural activation (Kanter et al., 2012). Alternatively, an individual with a very strong bond may not want to leave their companion animal and engage in therapeutic strategies such as exposure or self-care, resulting in adverse health and mental health outcomes. Furthermore, by understanding the relationship an individual has with their companion animal may provide insight into how they connect in relationships and as such, enable clinicians to consider what skills such client groups could enhance or learn in regard to relating to others and building human social connections.

Findings from this thesis highlight that the companion animal relationship can be a protective factor against suicide. This has important implications for mental health practitioners when assessing for protective factors against suicide, such as social supports, and including the companion animal relationship into their risk assessment as either a potential risk or protective factor. In the case of a companion animal being a potential protective factor, therapists could then consider them as part of a safety/management plan against suicide. If considered a risk factor, the mental health practitioner would be required to

work with the client to encourage understanding of the impact the companion animal relationship has and collaboratively work together to reach resolution.

6.4.3 Implications for research methodology in the field of the HAB

The mixed methods design of the thesis has implications for the HAB field of research. As previously mentioned, there has been continued criticism of the research methods used within HAB research and the associated limitations that may contribute to inconsistent outcomes (Chur-Hansen et al., 2010; Hosey & Melfi, 2014; Peacock et al., 2012; Brooks et al., 2016). Therefore, the methodological design of this thesis focused on mixing methodologies to enhance credibility and validity of the findings. There is a limited use of mixed methodology within the HAB field of research, particularly the use of two-way approach with a follow-up exploratory design, and incorporating similar research strategies may strengthen and provide clarity to the complexities within the field of research, both methodologically and theoretically. The field of HAB research may be advanced by using mixed method designs to account for each individual method's (i.e. quantitative and qualitative research) weaknesses with the strengths of the other (Turner et al., 2017; Gelo et al., 2008).

6.5 Methodological Strengths and Limitations

6.5.1 Strengths

A particular strength of this thesis was the mixed methodology research design. Such that, qualitative research completed information found in quantitative research by expanding on concepts that are not easily explored within quantitative methodology, with all studies

becoming directly linked (Hesse-Biber, 2010). This particular approach to investigating the research questions ensured the overall methodology of the thesis was rigorous and chosen specifically to best operationalise the collection of data to address the research questions posed. Furthermore, all studies demonstrated methodological rigour. For example, the online data collection method of snowballing the survey through social media, as recommended by Balter and Brunet (2012), in an effort to compensate for the hard-to-find sample of younger people and the overabundance of older adults who more frequently complete such surveys. Through the snowballing process, the survey was aimed at people within Australia and not limited to states or territories, this was evidenced in the qualitative sample when participants informally and voluntary offered information of where they resided, with some being outside the state of South Australia. Therefore, the results from Study Three study can be generalised to a national representation of Australia.

A quantitative study design was considered appropriate for Study One to assess and understand a large population, to explore members of the general population and provide a comparison of companion animal owners and non-owners. The methodological strengths for Study One applied to Study Two which maintained consistency of methodological rigour as Study Two assessed a subsample from Study One's dataset. Study Three applied rigorous qualitative research methods as outlined in Braun & Clarke (2016) and applied the quality assurance checks recommended by Tracy (2010). Participants from this study engaged in the interviews without incentive and spoke for approximately 25 to 30 minutes about their companion animal and human-human relationships, indicating a willingness to participate. Study Three's main strength as part of this thesis is that it is the only qualitative study exploring a sample of women who have low to moderate levels of human social support and

strong HAB and comparing their experiences with their human and companion animal relationships.

As reflected upon in Chapter Three, my insider role as a woman, psychologist and companion animal owner could potentially contribute as both a strength and limitation to the thesis. As fellow women, the female participants may have felt more comfortable discussing sensitive issues during the interview process if they felt less prejudiced, and subsequently were more open and truthful with information they shared contributing to richness of the data. Similarly, despite not disclosing I was a psychologist, as a psychologist I may have enhanced the rapport with participants and made them feel more comfortable to discuss sensitive issues with trust and sincerity. As a companion animal owner having my own experiences with a companion animal relationship, my own personal biases could have potentially influenced my interpretation of the data. However, engaging in reflexive practice and discussing potential biases in supervision, helped reduced the impact of my own perspectives and beliefs about the benefits of the companion animal relationship on the outcomes of the study.

6.5.2 Limitations

The majority of methodological limitations have been previously outlined within the three papers that make up this thesis. However, there are some potential limitations that apply to the thesis as a whole. For example, the thesis did not measure or account for participants being influenced by social desirability. It is possible males were influenced by the traditional socialization of their roles and gendered masculinity and provided biased answers to fit with cultural norms and expectations (Blazina & Kogan, 2016). Furthermore, women who were interviewed may have biases towards presenting a positive relationship with their companion

animal and not highlighting concerns of animal abuse and neglect, particularly since a woman's role is seen as more emotive and nurturing towards other beings than men (Fraser & Taylor, 2017; Herzog, 2007; Zimolag & Krupa, 2009).

A limitation for this thesis as a whole was the presentation of the mixed methodology findings into two publishable papers as opposed to one, as briefly mentioned in Chapter Two. For HAB researchers, exposure to mixed methods research design in journal articles (as one paper) could potentially encourage the practice and replication of mixed methodology in future studies. Hence, efforts were made to outline the overall methodological aims within Study Two's paper. The limited ability to publish large mixed methods studies with rich qualitative findings has been reported as a common barrier within mixed methods design (Yoshikawa et al., 2008). Consequently, due to the volume of descriptive data produced by the qualitative study separate papers were produced to explore all the relevant research questions.

Study Three did not necessarily take a strengths-based approach to investigating the impact that companion animals have on a woman's ability to process adverse experiences. The interview questions focused on maintaining neutrality (please see Appendix H for a complete list of interview questions) and therefore, did not specifically focus on the construct of resilience. The PhD candidate considered that to focus on resilience may have caused responses bias. However, the interview questions that focused on the comparison between human and companion animal relationships were more strengths based, such as encouraging participant to focus on the positive and negative aspects of their support relationship.

Additional methodological limitations for the quantitative data collection for Study One and Two were data collection methods and statistical analysis. As mentioned in Study One, methodological limitations included the sample having a reduced number of older adults (i.e. 60+ years old) and suggested employing additional data collection methods to increase that age group in the sample. For example, the PhD researcher could have attended elderly care housing communities with paper hardcopies of the survey and distributing them via a central communal area where they could be accessed voluntarily, and provided a box for completed surveys without the presence of a researcher, in an effort to protect anonymity. Combining online with paper data collection would overcome the weaknesses of online data collection by including a mode of data collection that may be more suitable for certain populations (Dillman, Smyth, & Christian, 2014). Furthermore, Study One compared levels of resilience between companion animal owners and non-owners, however there are multiple complexities and health differences that may have impacted the outcomes of this group comparison, such as socio-demographic factors, or gender and age, and not necessarily companion animal ownership patterns alone. Conducting statistical analysis, such as a multiple regression or ANCOVA, that could control for such demographic influences would take account of health differences that may contribute as a compounding factor.

6.6 Future Research

The overall findings from this thesis, in the context of its methodological strengths and weaknesses, highlight some areas for future research. For instance, future research could continue investigation of the curvilinear relationship with the HAB and human social support to develop a greater understanding of the differences in the strength of the HAB relationships. For example, determining the subpopulation that most likely has moderate levels of HAB and high levels of human social support and then exploring their relationship with their

companion animal, and how that relationship compares to those with strong HAB and low to moderate human social support. It could be that people with moderate levels of HAB and high human social support have different lifestyles that impact their relationship with their companion animal, such as families with children where children are prioritised over the companion animal, as suggested in research by Shir-Vertesh (2012).

In keeping with the strengths-based approach, investigation of the curvilinear relationship could be applied to other mental health constructs to determine whether there is a curvilinear relationship between the HAB and other outcomes such as hope, gratitude, and perseverance. Furthermore, the curvilinear relationship could be measured with other mental health constructs using different measurements of the HAB to determine whether findings can be generalised to other research tools that also measure the quality and strength of the HAB (e.g. the Pet Bonding Scale, PBD; Angle, 1994). Furthermore, future research should consider utilising the strength of the HAB as a theoretical framework, as opposed to the theory of attachment with companion animals based on Bowlby's theory of attachment (1988), as evidence from this thesis would suggest that the HAB does not map directly onto human relationships as companion animals cannot offer everything quality human supports can.

Finally, the findings from this thesis have significant clinical implications for practitioners. Therefore, future research could include conducting qualitative interviews with psychologists and other applied health professionals to determine how they incorporate companion animal relationships into the assessment and therapeutic process. Moreover, professional development training on the nature of the HAB could be provided and evaluated for the outcomes of knowledge and skills gained. In addition, future research could consider

a longitudinal study with clinical practice educators and students, such as interviewing students prior to engaging in learning as to what they know and understand about the HAB and then follow up at time points throughout their training to explore difference in knowledge and whether they have learned and are applying skills in therapeutic practice.

6.7 Conclusion

This thesis has explored the relationship between the HAB, human social support and resilience, provides a significant contribution to understanding the relationship between the HAB and human social support, and highlights the implication this has for both clinical practice and the field of research. To best generate credible and reliable outcomes, this thesis has used rigorous mixed methodology and a strong theoretical framework that emphasised the strength of the bond as having an impact on mental health outcomes by providing a buffer throughout adversity.

This thesis contributes original findings to the HAB field of research, such as finding a curvilinear relationship between HAB and human social support, a subpopulation of single women with low to moderate human social support and stronger HAB, and that women with lower levels of human social support and stronger HAB showing a preference for their companion animals over other human relationships. Such findings emphasise that companion animals can offer valuable elements of support over that of human relationships. Yet, this thesis also acknowledges that the HAB does not moderate the relationship between human social support and resilience and therefore, the HAB cannot offer all elements of support potentially offered within human relationships. The role of companion animals as an aid through adversity and as a protective factor against suicide support previous research, yet this thesis provides insight to a population of women this particularly impacts.

Clinical practice can be enhanced by understanding clients' significant relationships, including that with companion animals, how they impact a client's life story, and in particular whether they are a risk or protective factor for therapeutic outcomes. The findings from this thesis show that companion animals can provide comfort and aid through adversity, however, also highlights that the complexities of the companion animal relationship can negatively impact mental health concerns. Therefore, clinicians should give important consideration to including the HAB into their clinical practice.

APPENDIX A. Study One Flyer

THE UNIVERSITY of ADELAIDE

Do our relationships make us stronger?

Can the strength of our connection to others help us bounce back from adversity?

Please help answer this question to advance the research!

Please take a tab to access the survey!

Completing the survey may not directly benefit you; however the information you provide will give us a better understanding of the relationship between individuals' relationships and their responses to life stressors. The questionnaire can be completed in your own time, taking no more than 15 minutes. It is not anticipated that any items in this study will cause distress; and you can stop participating at any time.

Please enter this website address into your search browser to access the survey: www.surveymonkey/exploringresilienceandrelationships

Please enter this website address into your search browser to access the survey: www.surveymonkey/exploringresilienceandrelationships
Please enter this website address into your search browser to access the survey: www.surveymonkey/exploringresilienceandrelationships
Please enter this website address into your search browser to access the survey: www.surveymonkey/exploringresilienceandrelationships
Please enter this website address into your search browser to access the survey: www.surveymonkey/exploringresilienceandrelationships
Please enter this website address into your search browser to access the survey: www.surveymonkey/exploringresilienceandrelationships
Please enter this website address into your search browser to access the survey: www.surveymonkey/exploringresilienceandrelationships
Please enter this website address into your search browser to access the survey: www.surveymonkey/exploringresilienceandrelationships
Please enter this website address into your search browser to access the survey: www.surveymonkey/exploringresilienceandrelationships
Please enter this website address into your search browser to access the survey: www.surveymonkey/exploringresilienceandrelationships

APPENDIX B. Study One email correspondence to targeted subgroups

To Whom it May Concern,

My name is Lian Hill, and I am currently undertaking a PhD at the University of Adelaide. I'm studying what contributes to an individual's ability to bounce back during times of adversity, in other words, their psychological resilience. My aim is to investigate the link between resilience, social support, attachment, and animal companionship. To do this, I am collecting information from people in the community by asking them to complete a survey, and am writing to extend an invitation to your organisation to take part in this study.

If you would be interested and willing to participate, I am hoping that you could distribute the survey to your members via email or by putting the attached flyer on a communal notice board. Also, please find attached an Information Sheet that outlines the details of the study and the benefits that it can provide. There are no foreseeable risks to anyone who participates in the study and confidentiality is ensured. The study has been approved by the University of Adelaide's School of Psychology Human Ethics Committee, and the researcher collecting data is available to answer any queries or further discussion.

The survey can be found by accessing this link:

https://www.surveymonkey.com/r/exploringrelationshipsandresilience

Thank you in advance for any consideration you provide to this proposal and taking the time to read and consider this invitation. Please do not hesitate to contact me with any queries or for further information you may have regarding our study.

Kind regards,

Lian Hill

APPENDIX C. Study One online survey

Dear Participants,

We are currently undertaking research looking at the effects of social relationships and the human-animal bond, and the role it plays in psychological resilience in the adult population. This research is for Lian Hill's PhD thesis. We hope and appreciate that you have time to complete our survey.

About the project:

This project explores the ways in which our social connections and pets can serve as friends or family members, and how our relationship with them affects our life, including our emotions. Using a survey, the project can measure individual strengths such as one's ability to bounce back from adversity, social relationships and how attached an individual is to their pet. We are seeking companion animal owners and non-owners who are over 18 and reside within Australia to complete this survey.

Your role:

Completing the survey may not directly benefit you; however the information you provide will give us a better understanding of the relationship between animal companionship, individuals' responses to life stressors, and their level of social support. This knowledge might be useful for health professionals (for example, they may better understand the importance of pets as family), and councils and governments might be interested in our results when deciding upon planning or policy. The questionnaire can be completed in your own time, taking no more than 15 minutes.

Assurances:

Completing questionnaires can be distressing for some people. It is not anticipated that any items in this study will cause distress. If any questions make you feel upset, you are free to discontinue participating at any time. You can be assured that all information you provide will be kept in the strictest confidence. Whilst results from the study will be published, no one individual who participates will be identified in the results.

Instructions:

By clicking 'Agree' on the next page you provide your consent to participate. Please continue to the next page and start working through the questions in the survey, marking one response per question and answering as honestly as you can. There is an option at the end to leave your contact information if you would be interested in participating in future research related to this project. Just click 'Done' when complete!

If you have any enquiries concerning this research project, please contact Lian Hill (PhD/Masters of Psychology (Clinical) Candidate) on (08) 8313 3401 or by email (lian.hill@adelaide.edu.au), Primary Supervisor of Project Professor Helen Winefield on (08) 8313 3172 or by email (helen.winefield@adelaide.edu.au), or Chair of the School of Psychology Human Research Ethics Committee, Professor Paul Delfabbro on (08) 8303 4936 or by email (paul.delfabbro@adelaide.edu.au).

Once again, thank you for participating!

Exploring social relationships and their effect on resilience

Human Research Ethics Committee (HREC)

CONSENT FORM TO PARTICIPATE IN HEALTH RESEARCH

1. I have read the information on the previous page that has been provided to me and agree to take part in the following research project:

Title: Exploring social relationships and their effect on resilience

Ethics Approval Number:

2. I have had the project, so far as it affects me, fully explained to my satisfaction via the information provided on the previous page. My consent is given freely.

3. I understand the purpose of the research project and I understand that involvement may not be of any benefit to me.

4. I understand that while information gained during the study may be published, I will not be identified and my personal results will not be divulged.

5. I understand that I am free to withdraw from the study at any time.

☐ Agree

☐ Disagree -Thank you for reading about this project and giving it your consideration. By clicking 'Disagree' you will not participate any further in this research project, please exit the survey accordingly by closing the online window.

3

Exploring social relationships and their effect on resilience

What gender are you:

- ◯ Male
- ◯ Female
- ◯ Other

Which category below includes your age?

Why type of residence do you live in?

What is the highest level of education you have completed?

Which of the following best describes your current relationship status?

- ◯ Married
- ◯ Widowed
- ◯ Divorced
- ◯ Separated
- ◯ In a domestic partnership; de facto, or civil union
- ◯ Single, never married

How many people currently live in your household?

4

Exploring social relationships and their effect on resilience

Please answer each of the following questions as honestly as you can, in terms of how you feel right now. This questionnaire is anonymous and no one will ever know which answers are yours. So don't worry about how you think others might answer these questions. There aren't any right or wrong answers. All that matters is that you express your true thoughts on the subject. Please answer by clicking on one of the following options for each question:

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Unsure	Slightly Agree	Moderately Agree	Strongly Agree
I really like seeing pets enjoy their food.	◯	◯	◯	◯	◯	◯	◯
My pet means more to me than any of my friends (or would if I had one).	◯	◯	◯	◯	◯	◯	◯
I would like to have a pet in my home.	◯	◯	◯	◯	◯	◯	◯
Having a pet is a waste of money.	◯	◯	◯	◯	◯	◯	◯
House pets add happiness to my life (or would if I had one).	◯	◯	◯	◯	◯	◯	◯
I feel that pets should always be kept outside.	◯	◯	◯	◯	◯	◯	◯
I spend time every day playing with my pet (or would if I had one).	◯	◯	◯	◯	◯	◯	◯
I have occasionally communicated with my pet and understood what it was trying to express (or would if I had one).	◯	◯	◯	◯	◯	◯	◯
The world would be a better place if people would stop spending so much time caring for their pets and started caring more for other human beings instead.	◯	◯	◯	◯	◯	◯	◯

5

Please answer each of the following questions as honestly as you can, in terms of how you feel right now. This questionnaire is anonymous and no one will ever know which answers are yours. So don't worry about how you think others might answer these questions. There aren't any right or wrong answers. All that matters is that you express your true thoughts on the subject. Please answer by clicking on one of the following options for each question:

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Unsure	Slightly Agree	Moderately Agree	Strongly Agree
I like to feed animals out of my hand.	○	○	○	○	○	○	○
I love pets.	○	○	○	○	○	○	○
Animals belong in the wild or in zoos, but not in the home.	○	○	○	○	○	○	○
If you keep pets in the house you can expect a lot of damage to furniture.	○	○	○	○	○	○	○
I like house pets.	○	○	○	○	○	○	○
Pets are fun but it's not worth the trouble of owning one.	○	○	○	○	○	○	○
I frequently talk to my pet(s) (or would if I had one).	○	○	○	○	○	○	○
I hate animals.	○	○	○	○	○	○	○
You should treat your house pet with as much respect as you would a human member of your family.	○	○	○	○	○	○	○

Do you live with a pet?

☐ Yes

☐ No

6

Exploring social relationships and their effect on resilience

What type of pet do you currently have? (If you have more than one pet, please think of your main, closest pet when answering this question)

If you have more than one pet, please answer the following series of questions when thinking of the pet you are closest to, or have had the longest.

Exploring social relationships and their effect on resilience

Please tell us whether you agree or disagree with some very brief statements about your favourite pet. For each statement, click whether you strongly agree, somewhat agree, somewhat disagree, or strongly disagree. You may refuse to answer to select don't know.

My pet means more to me than any of my friends.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

Quite often I confide in my pet.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

I believe that pets should have the same rights and privileges as family members.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Agree Strongly
- ◯ Don't Know or Refuse

I believe my pet is my best friend.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

Quite often, my feelings towards people are affected by the way they react to my pet.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

I love my pet because he/she is more loyal to me than most of the people in my life.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

I enjoy showing other people pictures of my pet.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

I think my pet is just a pet

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

I love my pet because it never judges me.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

My pet knows when I'm feeling bad.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

I often talk to other people about my pet.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

10

My pet understands me.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

I believe that loving my pet helps me stay healthy.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

Pets deserve as much respect as humans do.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

My pet and I have a very close relationship.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

I would do almost anything to take care of my pet.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

I play with my pet quite often.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

I consider my pet to be a great companion.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

My pet makes me feel happy.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

I feel that my pet is a part of my family.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

I am not very attached to my pet.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

Owning a pet adds to my happiness.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

I consider my pet to be a friend.

- ◯ Agree Strongly
- ◯ Agree Somewhat
- ◯ Disagree Somewhat
- ◯ Disagree Strongly
- ◯ Don't Know or Refuse

Exploring social relationships and their effect on resilience

We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement by clicking the appropriate answer using the scale.

	Very Strongly Disagree	Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree	Very Strongly Agree
There is a special person who is around when I am in need.	○	○	○	○	○	○	○
There is a special person with whom I can share joys and sorrows.	○	○	○	○	○	○	○
My family really tries to help me.	○	○	○	○	○	○	○
I get the emotional help and support I need from my family.	○	○	○	○	○	○	○
I have a special person who is a real source of comfort to me.	○	○	○	○	○	○	○
My friends really try to help me.	○	○	○	○	○	○	○
I can count on my friends when things go wrong.	○	○	○	○	○	○	○
I can talk about my problems with my family.	○	○	○	○	○	○	○
I have friends with whom I can share my joys and sorrows.	○	○	○	○	○	○	○
There is a special person in my life who cares about my feelings.	○	○	○	○	○	○	○
My family is willing to help me make decisions.	○	○	○	○	○	○	○

14

	Very Strongly Disagree	Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree	Very Strongly Agree
I can talk about my problems with my friends.	○	○	○	○	○	○	○

15

Exploring social relationships and their effect on resilience

For each item, please indicate how much you agree with the following statements as they apply to you over the last month. If a particular situation has not occurred recently, answer according to how you think you would have felt.

	Not true at all	Rarely true	Sometimes true	Often true	True nearly all the time
I am able to adapt when changes occur.	○	○	○	○	○
I have at least one close and secure relationship that helps me when I am stressed.	○	○	○	○	○
When there are no clear solutions to my problems, sometimes fate or God can help.	○	○	○	○	○
I can deal with whatever comes my way.	○	○	○	○	○
Past successes give me confidence in dealing with new challenges and difficulties.	○	○	○	○	○
I try to see the humorous side of things when I am faced with problems.	○	○	○	○	○
Having to cope with stress can make me stronger.	○	○	○	○	○
I tend to bounce back after illness, or other hardships.	○	○	○	○	○
Good or bad, I believe that most things happen for a reason.	○	○	○	○	○

For each item, please indicate how much you agree with the following statements as they apply to you over the last month. If a particular situation has not occurred recently, answer according to how you think you would have felt.

	Not true at all	Rarely true	Sometimes true	Often true	True nearly all the time
I give my best effort no matter what the outcome may be.	○	○	○	○	○
I believe I can achieve my goals, even if there are obstacles.	○	○	○	○	○
Even when things look hopeless, I don't give up.	○	○	○	○	○
During times of stress/crisis, I know where to turn for help.	○	○	○	○	○
Under pressure, I stay focused and think clearly.	○	○	○	○	○
I prefer to take the lead in solving problems rather than letting others make all the decisions.	○	○	○	○	○
I am not easily discouraged by failure.	○	○	○	○	○
I think of myself as a strong person when dealing with life's challenges and difficulties.	○	○	○	○	○

17

For each item, please indicate how much you agree with the following statements as they apply to you over the last month. If a particular situation has not occurred recently, answer according to how you think you would have felt.

	Not true at all	Rarely true	Sometimes true	Often true	True nearly all the time
I can make unpopular or difficult decisions that affect other people, if it is necessary.	○	○	○	○	○
I am able to handle unpleasant or painful feelings like sadness, fear, and anger.	○	○	○	○	○
In dealing with life's problems, sometimes you have to act on a hunch without knowing why.	○	○	○	○	○
I have a strong sense of purpose in life.	○	○	○	○	○
I feel in control of my life.	○	○	○	○	○
I like challenges.	○	○	○	○	○
I work to attain my goals no matter what road blocks I encounter along the way.	○	○	○	○	○
I take pride in my achievements.	○	○	○	○	○

18

Exploring social relationships and their effect on resilience

If you have a pet and would be interested in participating in future research about the Human-Animal Bond, and would be willing to take part in a short interview about your relationship with your pet, please leave your contact details below. The interview would take approximately 15 minutes and be conducted over the telephone at a time convenient to you.

Thank you for your consideration of continued research.

****Please note: All data from the current study, plus that provided in an interview, will not be identified and personal results will not be divulged.**

19

Exploring social relationships and their effect on resilience

You have now completed the survey. Thank you for your participation.

Once participants responses have be collected, I will then be working on the analysis. A summary of the results of this study will be posted at my University webpage in a years time.

www.adelaide.edu.au/directory/lian.hill

Or alternatively, please leave your email address if you would like to receive feedback on the findings and outcomes of this study when it is complete.

20

APPENDIX D. Study One Information Sheet

THE UNIVERSITY of ADELAIDE

Information Sheet

Dear Participants,

We are currently undertaking research looking at the effects of social relationships and the human-animal bond, and the role these play in psychological resilience in the adult population. This research is for Lian Hill's PhD thesis. We hope and appreciate that you have time to complete our survey.

About the project:
This project explores the roles that social connections and sometimes pets, can play in our lives, and how these relationships affect our emotions. Using a survey, the project can measure individual strengths such as one's ability to bounce back from adversity, social relationships and how attached people feel to their pets. We are seeking companion animal owners *and* non-owners who are over 18 and reside within Australia to complete this survey.

Your role:
Completing the survey may not directly benefit you; however the information you provide will give us a better understanding of the relationship between animal companionship, individuals' responses to life stressors, and their level of social support. This knowledge might be useful for health professionals (for example, they may better understand the importance of pets as family), and councils and governments might be interested in our results when deciding upon planning or policy. The questionnaire can be completed in your own time, taking no more than 15 minutes.

Assurances:
Completing questionnaires can be distressing for some people. It is not anticipated that any items in this study will cause distress. If any questions make you feel upset, you are free to discontinue participating at any time. You can be assured that all information you provide will be kept in the strictest confidence. Whilst results from the study will be published, no one individual who participates will be identified in the results.

Instructions:
By clicking 'Agree' on the page within the online survey, you provide your consent to participate. Please continue to the next page and start working through the questions in the survey, marking one response per question and answering as honestly as you can. There is an option at the end to leave your contact information if you would be interested in participating in future research related to this project. Just click 'Done' when complete!

If you have any enquiries concerning this research project, please contact Lian Hill (PhD/Masters of Psychology (Clinical) Candidate) on 0431 433 327 or by email (lian.hill@adelaide.edu.au), the Primary Supervisor of Project Professor Helen Winefield on (08) 8313 3172 or by email (helen.winefield@adelaide.edu.au), or the Chair of the School of Psychology Human Research Ethics Committee, A/Prof. Paul Delfabbro on (08) 8303 4936 or by email (paul.delfabbro@adelaide.edu.au).

Once again, thank you for participating!

APPENDIX E. Study One Consent Form

Consent Form

Human Research Ethics Committee (HREC)

CONSENT FORM TO PARTICIPATE IN HEALTH RESEARCH

1. I have read the attached information that has been provided to me and agree to take part in the following research project:

   Title: Exploring the effects of social relationship on resilience
   Ethics Approval Number:

2. I have had the project, so far as it affects me, fully explained to my satisfaction via the information provided on the previous page. My consent is given freely.

3. I understand the purpose of the research project and I understand that involvement may not be of any benefit to me.

4. I understand that while information gained during the study may be published, I will not be identified and my personal results will not be divulged.

5. I understand that I am free to withdraw from the study at any time.

APPENDIX F. Study Three Information Sheet

PARTICIPANT INFORMATION SHEET

PROJECT TITLE: Understanding the relationship between social support and an individual's bond with their pet.
HUMAN RESEARCH ETHICS COMMITTEE APPROVAL NUMBER: H-2017-83
PRINCIPAL INVESTIGATOR: Professor Helen Winefield
STUDENT RESEARCHER: Lian Hill
STUDENT'S DEGREE: PhD/Masters of Psychology (Clinical) Candidate

Dear Participant,

You are invited to participate in the research project described below.

What is the project about?

The aim of this study is to gain a better understanding of the relationship between women pet owners and their pets, and how it compares to other human relationships in their lives. This research is interested in what challenges pet owners may face, what the strengths and weaknesses of their pet relationship are, as well as the pets role, if any, in helping them cope with difficult times. To do this, the questions will focus on the pet owners relationship with their current pet, and ask about how that compares to their current supportive human relationship in their lives. This study does not intend to discuss any difficulties within previous or current relationships, nor a detailed account of a difficult time in an individual's life, but reflect on different aspects of the pet relationship and whether it provides support similar to what an owner may have from their human social networks.

Furthermore, the study aims to determine the place a pet has in an owner's life, how their life is changed by having a pet, how the pet fits within the dynamics of their home and/or family, and how and why they acquired their pet. The information gathered may contribute to the research evidence about the relationships between owners and their pets, and what kind of support pets may provide.

Who is undertaking the project?

This project is being conducted by Lian Hill. This research will form the basis for the degree of PhD at the University of Adelaide under the supervision of Professor Helen Winefield and Dr Pauleen Bennett.

Why am I being invited to participate?

We are seeking woman pet owners who are over 18 and reside within Australia to participate in interviews.

What will I be asked to do?

As a participant in this study, you will be involved in a one-on-one interview with the researcher, conducted either at the university or via telephone, as per your convenience. The interview will take

approximately 30 minutes, where the researcher will ask a series of questions relating to your experiences with your pet.

Are there any risks associated with participating in this project?

Participating in research interviews can be distressing for some people. It is not anticipated that any questions asked in this study will cause distress. If any questions make you feel upset, you are free to discontinue participating at any time. You can be assured that all information you provide will be kept in the strictest confidence. Whilst results from the study will be published, no one individual who participates will be identified in the results.

If, as a result of participating in this study, you feel distressed by the content that you have discussed with the interviewer or feel you would like to seek some supportive counselling, please contact one of the following agencies: Relationships Australia SA - 1300 364 277, Lifeline - 13 11 14, Mental Health Triage Services - 13 14 65, or alternatively visit SA Health's Mental Health Services website for a list of mental health services within the community. (http://www.sahealth.sa.gov.au/wps/wcm/connect/Public+Content/SA+Health+Internet/Health+services/Mental+health+services/)

What are the benefits of the research project?

Participating in the interview is not expected to benefit you directly; however the information you provide will give us a better understanding of the relationship between owners and their pets, individuals' responses to life stressors, and the level of social support in their lives. This knowledge might be useful for health professionals (for example, they may better understand the importance of pets as family), and councils and governments might be interested in our results when deciding upon planning or policy.

Can I withdraw from the project?

Participation in this project is completely voluntary. If you agree to participate, you can withdraw from the study at any time.

What will happen to my information?

The interview will be audio recorded and then transcribed by the interviewer, who will then send you a copy of the transcript, giving you an opportunity to check for accuracy of the transcript and provide any further feedback if you wish.

All materials and data will be in electronic format. During the project data will be stored on a secure, password protected Word document, only accessible by the researchers involved in the project and listed on this ethic application. The Word document will be stored on the research student Lian Hill's university computer which is also password protected. On completion of the project the data will be kept at the University of Adelaide on a password protected computer within the School of Psychology. The data will be retained by the University for a period of 5 years after the study is complete and

submitted for publication. After this time, the data will be destroyed by deleting it from the University's password protected computer.

The information from all participants will be analysed and results will be submitted for publication as a journal article as well as part of a PhD thesis. Participants will not be identifiable in any written results as only aggregated data will be published. However, a summary of the results will be provided to all participants on follow up from the study outcomes.

Who do I contact if I have questions about the project?

If you have any enquiries concerning this research project, please contact Lian Hill (PhD/Masters of Psychology (Clinical) Candidate) on (08) 8313 3401 or by email (lian.hill@adelaide.edu.au), the Primary Supervisor of the project Professor Helen Winefield on (08) 8313 3172 or by email (helen.winefield@adelaide.edu.au), or the Chair of the School of Psychology Human Research Ethics SubCommittee, A/Prof. Paul Delfabbro on (08) 8303 4936 or by email (paul.delfabbro@adelaide.edu.au).

What if I have a complaint or any concerns?

The study has been approved by the School of Psychology Human Research Ethics SubCommittee at the University of Adelaide (Chair A/Prof. Paul Delfabbro; Approval Number H-2017-83). If you have questions or problems associated with the practical aspects of your participation in the project, or wish to raise a concern or complaint about the project, then you should consult the Principal Investigator, Professor Helen Winefield (information provided above). If you wish to speak with an independent person regarding a concern or complaint, the University's policy on research involving human participants, or your rights as a participant, please contact the Human Research Ethics Committee's Secretariat on:
Phone: +61 8 8313 6028
Email: hrec@adelaide.edu.au
Post: Level 4, Rundle Mall Plaza, 50 Rundle Mall, ADELAIDE SA 5000
Any complaint or concern will be treated in confidence and fully investigated. You will be informed of the outcome.

If I want to participate, what do I do?

If you would like to participate in this study, please sign and return the attached consent form within the email you have received. Upon receiving the signed consent form, the researcher will contact you to make arrangements for an interview appointment at a time and place that is suitable to you.

Yours sincerely,

Lian Hill
Professor Helen Winefield
Dr Pauleen Bennett

APPENDIX G. Study Three Consent Form

Human Research Ethics Committee (HREC)

CONSENT FORM

1. I have read the attached Information Sheet and agree to take part in the following research project:

Title:	Understanding the relationship between social support and an individual's bond with their pet.
Ethics Approval Number:	**1783**

2. I have had the project, so far as it affects me, fully explained to my satisfaction by the research worker. My consent is given freely.

3. Although I understand the purpose of the research project it has also been explained that involvement may not be of any benefit to me.

4. I have been informed that, while information gained during the study may be published, I will not be identified and my personal results will not be divulged.

5. I understand that I am free to withdraw from the project at any time.

6. I agree to the interview being audio recorded. Yes ☐ No ☐

7. I am aware that I should keep a copy of this Consent Form, when completed, and the attached Information Sheet.

Participant to complete:

Name: _____ Signature:_____ Date: _____

Researcher/Witness to complete:

I have described the nature of the research to _____
(print name of participant)

and in my opinion she/he understood the explanation.

Signature: _____ Position: _____ Date: _____

APPENDIX H. Study Three Qualitative Interview Questions

Qualitative Interview Questions

1. Can you tell me about your family/pet dynamics in your home (prompt: how many people live in your home? Who is your pet's primary carer?)
2. How does your relationship with your pet compare to other relationships you have with your family and/or friends?
3. Can you tell me what it's like for you having a pet?
4. How did you end up having a pet? (prompt: was it by choice? If so, why? Or did it just happen?)
5. How is life different from when you didn't have a pet?
6. Can you tell me about any challenges or issues you have faced as a pet owner?
7. What is the most positive thing about being a pet owner? The most negative?
8. If you were to reflect back to a time of adversity in your life, which you managed to overcome, what helped you at that time? What impact did your pet have on your ability to process your challenges? (prompt: did having a pet at the time of your adversity make it harder to process? Or did it help in some way?)
9. Is there anything else you would like to add?

References

ABS. (2017). National health survey: Education. Retrieved from ABS website: https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/1246.0main+features33June%202014

Ahmadi, A. (2015). Social Support and Women's Health. *Women's Health Bulletin, 3*(1), 1-6. doi:10.17795/whb-31083

Ahn, S., Kim, S., & Zhang, H. (2016). Changes in Depressive Symptoms among Older Adults with Multiple Chronic Conditions: Role of Positive and Negative Social Support. *International journal of environmental research and public health, 14*(1). doi:10.3390/ijerph14010016

Albert, A., & Bulcroft, K. (1988). Pets, Families, and the Life Course. *Journal of Marriage and the Family, 50*(2), 543. doi:10.2307/352019

Allwood, C. M., & Allwood, C. M. (2012). The distinction between qualitative and quantitative research methods is problematic. *Quality & quantity, 46*(5), 1417-1429. doi:10.1007/s11135-011-9455-8

American Psychological Association. (2014). *The road to resilience*. Retrieved from https://www.apa.org/helpcenter/road-resilience:

American Veterinary Medical Association. (2020). Human animal bond. Retrieved from https://www.avma.org/one-health/human-animal-bond

Amiot, C., Bastian, B., & Martens, P. (2016). People and Companion Animals: It Takes Two to Tango. *BioScience, 66*(7), 552-560. doi:10.1093/biosci/biw051

Anderson, D. C. (2007). *Assessing the human-animal bond : a compendium of actual measures*. West Lafayette, Ind.: Purdue University Press.

Angle, R. L. (1994). Utilization of the Pet Bonding Scale to examine the relation between the human/companion animal bond and self-esteem in pre-adolescence. In: ProQuest Dissertations Publishing.

Animal Medicine Australia. (2016). *Pet ownership in Australia*. Retrieved from https://animalmedicinesaustralia.org.au/wp-content/uploads/2016/11/AMA_Pet-Ownership-in-Australia-2016-Report_sml.pdf:

Antonacopoulos, N. M. D., & Pychyl, T. A. (2010). An Examination of the Potential Role of Pet Ownership, Human Social Support and Pet Attachment in the Psychological Health of Individuals Living Alone. *Anthrozoos, 23*(1), 37-54. doi:10.2752/175303710X12627079939143

Antonucci, T. C. (1985). Social Support: Theoretical Advances, Recent Findings and Pressing Issues. In I. G. Sarason & B. R. Sarason (Eds.), *Social Support: Theory, Research and Applications* (pp. 21-37). Dordrecht: Springer Netherlands.

Arkow, P. (2019). Chapter 17 - The "Dark Side" of the Human-Animal Bond. In L. Kogan & C. Blazina (Eds.), *Clinician's Guide to Treating Companion Animal Issues* (pp. 319-346): Academic Press.

Australian Bureau of Statistics. (2019). Twenty years of population change. Retrieved from: https://www.abs.gov.au/ausstats/abs@.nsf/0/1CD2B1952AFC5E7ACA257298000F2E76

Australian Companion Animal Council. (2010). *Contribution of the pet care industry to the Australian economy*. Retrieved from Rockwell Communications:

Australian Institute of Health and Welfare. (2018). *Australia's health 2018*. Retrieved from Canberra: https://www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/table-of-contents

Baltar, F., & Brunet, I. (2012). Social research 2.0: virtual snowball sampling method using Facebook. *Internet Research, 22*(1), 57-74. doi:10.1108/10662241211199960

Bao, K. J., & Schreer, G. (2016). Pets and Happiness: Examining the Association between Pet Ownership and Wellbeing. *Anthrozoos, 29*(2), 283-296. doi:10.1080/08927936.2016.1152721

Barker, S. B., & Wolen, A. R. (2008). The Benefits of Human-Companion Animal Interaction: A Review. *Journal of veterinary medical education, 35*(4), 487-495. doi:10.3138/jvme.35.4.487

Barrera, M. (1986). Distinctions between social support concepts, measures, and models. *American journal of community psychology, 14*(4), 413-445. doi:10.1007/BF00922627

Beck, A., & Katcher, A. (1996). *Between pets and people : the importance of animal companionship* (Rev. ed.). West Lafayette, Ind.: Purdue University Press.

Beck, A., & Katcher, A. (2003). Future Directions in Human-Animal Bond Research. *American Behavioral Scientist, 47*(1), 79-93. doi:10.1177/0002764203255214

Beck, A., & Madresh, E. A. (2008). Romantic Partners and Four-Legged Friends: An Extension of Attachment Theory to Relationships with Pets. *Anthrozoos, 21*(1), 43-56. doi:10.2752/089279308X274056

Black, A., Winefield, H., & Chur-Hansen, A. (2011). Occupational Stress in Veterinary Nurses: Roles of the Work Environment and Own Companion Animal. *Anthrozoos, 24*(2), 191-202. doi:10.2752/175303711X12998632257503

Blazina, C., & Abrams, E. (2019). Chapter 13 - Working With Men and Their Dogs: How Context Informs Clinical Practice When the Bond Is Present in Males' Lives. In L. Kogan & C. Blazina (Eds.), *Clinician's Guide to Treating Companion Animal Issues* (pp. 223-252): Academic Press.

Blazina, C., Boyraz, G., & Shen-Miller, D. (2011). Introduction: Using Context to Inform Clinical Practice and Research. In C. Blazina, G. Boyraz, & D. Shen-Miller (Eds.), *The Psychology of the Human-Animal Bond: A Resource for Clinicians and Researchers* (pp. 3-24). New York, NY: Springer New York.

Blazina, C., & Kogan, L. (2016). An Introduction to Men and Their Dogs: A New Understanding of "Man's Best Friend". In C. Blazina & L. R. Kogan (Eds.), *Men and Their Dogs: A New Understanding of Man's Best Friend* (pp. 1-10). Cham: Springer International Publishing.

Blazina, C., O'Neil, J. M., & Denke, R. (2016). A New Understanding of Man's Best Friend: A Proposed Contextual Model for the Exploration of Human–Animal Interaction Among Insecurely Attached Males. In C. Blazina & L. R. Kogan (Eds.), *Men and their dogs: A new understanding of man's best friend* (pp. 47-71). Cham: Springer International Publishing. doi:10.1007/978-3-319-30097-9_3

Bonanno, G. A. (2004). Loss, trauma, and human resilience: Have we underestimated the human capacity to thrive after extremely aversive events?. *The American Psychologist, 59*(1), 20. doi:10.1037/0003-066X.59.1.20

Bonanno, G. A. (2012). Uses and abuses of the resilience construct: Loss, trauma, and health-related adversities. *Social science & medicine (1982), 74*(5), 753-756. doi:10.1016/j.socscimed.2011.11.022

Bonanno, G. A., & Burton, C., L. . (2013). Regulatory Flexibility: An Individual Differences Perspective on Coping and Emotion Regulation. *Perspectives on psychological science, 8*(6), 591-612. doi:10.1177/1745691613504116

Bonanno, G. A., Westphal, M., & Mancini, A. D. (2011). Resilience to loss and potential trauma. *Annual review of clinical psychology, 7*(1), 511-535. doi:10.1146/annurev-clinpsy-032210-104526

Bowlby, J. (1973). *Attachment and Loss: Volume II: Separation, Anxiety and Anger*. London: The Hogarth Press and the Institute of Psycho-Analysis.

Bowlby, J. (1988). *A secure base : clinical applications of attachment theory*. London: Routledge.

Bradley, L., & Bennett, P. C. (2015). Companion-Animals' Effectiveness in Managing Chronic Pain in Adult Community Members. *Anthrozoos, 28*(4), 635-647. doi:10.1080/08927936.2015.1070006

Braun, V., & Clarke, V. (2013). *Successful qualitative research : a practical guide for beginners*. London: SAGE Publications Ltd.

Brooks, H., Rushton, K., Lovell, K., Bee, P., Walker, L., Grant, L., & Rogers, A. (2018). The power of support from companion animals for people living with mental health problems: a systematic review and narrative synthesis of the evidence. *BMC Psychiatry, 18*(1). doi:10.1186/s12888-018-1613-2

Brooks, H., Rushton, K., Walker, S., Lovell, K., & Rogers, A. (2016). Ontological security and connectivity provided by pets: a study in the self-management of the everyday lives of people diagnosed with a long-term mental health condition.(Report). *BMC Psychiatry, 16*(1). doi:10.1186/s12888-016-1111-3

Brown, C., & Coan, J. A. (2016). The social regulation of neural threat responding. In L. S. Freund, S. McCune, L. Esposito, N. R. Gee, & P. McCardle (Eds.), *The social neuroscience of human-animal interaction* (pp. 127). American Psychological Association. doi:10.1037/14856-008

Bryan, J. L., Quist, M. C., Young, C. M., Steers, M.-L. N., Foster, D. W., & Lu, Q. (2014). Canine comfort: Pet affinity buffers the negative impact of ambivalence over emotional expression on perceived social support. *Personality and Individual Differences, 68*(0), 23-27. doi:http://dx.doi.org/10.1016/j.paid.2014.04.003

Burns, E., Fenwick, J., Schmied, V., & Sheehan, A. (2012). Reflexivity in midwifery research: The insider/outsider debate. *Midwifery, 28*(1), 52-60. doi:10.1016/j.midw.2010.10.018

Busetto, L., Wick, W., & Gumbinger, C. (2020). How to use and assess qualitative research methods. *Neurological research and practice, 2*(1), 14-14. doi:10.1186/s42466-020-00059-z

Caplan, G., Killilea, M., & Abrahams, R. B. (1976). *Support systems and mutual help : multidisciplinary explorations*. New York: Grune & Stratton.

Chandler, C. K., Fernando, D. M., Barrio Minton, C. A., & Portrie-Bethke, T. L. (2015). Eight Domains of Pet-Owner Wellness: Valuing the Owner-Pet Relationship in the Counseling Process. *Journal of mental health counseling, 37*(3), 268-282. doi:10.17744/mehc.37.3.06

Cheung, C.-K., & Kam, P. K. (2018). Conditions for pets to prevent depression in older adults. *Aging & mental health, 22*(12), 1627-1633. doi:10.1080/13607863.2017.1385723

Chur-Hansen, A., Winefield, H., & Beckwith, M. (2009). Companion animals for elderly women: The importance of attachment. *Qualitative Research in Psychology, 6*(4), 281-293. doi:https://doi.org/10.1080/14780880802314288

Chur-Hansen, A., Stern, C., & Winefield, H. (2010). COMMENTARY: Gaps in the evidence about companion animals and human health: some suggestions for progress. *International Journal of Evidence-Based Healthcare, 8*(3), 140-146. doi:doi:10.1111/j.1744-1609.2010.00176.x

Clara, I. P., Cox, B. J., Enns, M. W., Murray, L. T., & Torgrudc, L. J. (2003). Confirmatory Factor Analysis of The Multidimensional Scale of Perceived Social Support in

Clinically Distressed and Student Samples. *Journal of Personality Assessment, 81*(3), 265-270. doi:10.1207/S15327752JPA8103_09

Cobb, S. (1976). Social support as a moderator of life stress. *Psychosomatic Medicine, 38*(5), 300-314. doi:10.1097/00006842-197609000-00003

Cohen, S., & Lemay, E. P. (2007). Why would social networks be linked to affect and health practices? *Health Psychology, 26*(4), 410-417.

Cohen, S., & Wills, T. A. . (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*(2), 310-357. doi:https://doi.org/10.1037/0033-2909.98.2.310

Cohen, S., & Wills, T. A. (1985). Stress, Social Support, and the Buffering Hypothesis. *Psychological Bulletin, 98*(2), 310-357. doi:10.1037/0033-2909.98.2.310

Cohen, S. P. (2002). Can Pets Function as Family Members? *Western Journal of Nursing Research, 24*(6), 621-638. doi:10.1177/019394502320555386

Collis, G. M., & McNicholas, J. (1998). A theoretical basis for health benefits of pet ownership: attachment versus psychological support. . In C. C. Wilson & D. C. Turner (Eds.), *Companion animals in human health* (pp. 105-122). Thousand Oaks, CA: Sage. doi:https://doi.org/10.4135/9781452232959.n6

Connor, K. M., & Davidson, J. R. (2003). Development of a new resilience scale: the Connor-Davidson Resilience Scale (CD-RISC). *Depress Anxiety, 18*(2), 76-82. doi:10.1002/da.10113

Crawford, E. K., Worsham, N. L., & Swinehart, E. R. (2006). Benefits derived from companion animals, and the use of the term “attachment”. *Anthrozoos, 19*(2), 98-112. doi:10.2752/089279306785593757

Dambi, J. M., Corten, L., Chiwaridzo, M., Jack, H., Mlambo, T., & Jelsma, J. (2018). A systematic review of the psychometric properties of the cross-cultural translations and

adaptations of the Multidimensional Perceived Social Support Scale (MSPSS). *Health and Quality of Life Outcomes, 16*(1), 80-80. doi:10.1186/s12955-018-0912-0

de Souza, H. (2000). Use of the delphi technique and qualitative method to compare the way in which mental health consumers and providers understand the meaning of quality of life. In M. Jamieson (Ed.): ProQuest Dissertations Publishing.

Del Toro, J., & Yoshikawa, H. (2016). Invited Reflection: Intersectionality in Quantitative and Qualitative Research. *Psychology of Women Quarterly, 40*(3), 347-350. doi:10.1177/0361684316655768

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, Phone, Mail, and Mixed-Mode Surveys: The Tailored Design Method*. New York: John Wiley & Sons, Incorporated.

Duggan, M. (2016). *Investing in women's mental health. Strengthening the foundations for women, families and the Australian economy.* Melbourne: Australian Health Policy Collaboration.

Egeland, B., Carlson, E., & Sroufe, L. A. (1993). Resilience as process. *Development and psychopathology, 5*(4), 517-528. doi:10.1017/S0954579400006131

Endenburg, N., Hart, H. t., & Bouw, J. (1994). Motives for acquiring companion animals. *Journal of economic psychology, 15*(1), 191-206. doi:10.1016/0167-4870(94)90037-X

Esposito, L., McCardle, P., Maholmes, V., McCune, S., & Griffin, J. A. (2011). Introduction. In P. McCardle, M. McCune, J. A. Griffin, L. Esposito, & L. Freund (Eds.), *Animals in our lives: Human-animal interaction in family, community, & therapeutic settings* (pp. 1-5). Baltimore: Brookes. doi:https://doi.org/10.1037/14856-001

Fallon, M. (2016). *Writing up Quantitative Research in the Social and Behavioral Sciences*. Leiden: Brill.

Fergus, S., & Zimmerman, M. A. (2005). Adolescent resilience: a framework for understanding healthy development in the face of risk. *Annual review of public health, 26*, 399.

Field, A. P. (2013). *Discovering statistics using IBM SPSS statistics : and sex and drugs and rock 'n' roll* (4th ed. ed.). Los Angeles: Sage.

Fielding, N. G. (2012). Triangulation and Mixed Methods Designs: Data Integration With New Research Technologies. *Journal of mixed methods research, 6*(2), 124-136. doi:10.1177/1558689812437101

Fine, A. H. (2019). Chapter 1 - The Human-Animal Bond Over the Lifespan: A Primer for Mental Health Professionals. In L. Kogan & C. Blazina (Eds.), *Clinician's Guide to Treating Companion Animal Issues* (pp. 1-19): Academic Press. Retrieved from http://www.sciencedirect.com/science/article/pii/B9780128129623000010. doi:https://doi.org/10.1016/B978-0-12-812962-3.00001-0

Finlay, L., & Gough, B. (2003). *Reflexivity: A Practical Guide for Researchers in Health and Social Sciences*. London: UK: Wiley-Blackwell.

Fitzgerald, A. J. (2016). “They Gave Me a Reason to Live”: The Protective Effects of Companion Animals on the Suicidality of Abused Women. *Humanity & society, 31*(4), 355-378. doi:10.1177/016059760703100405

Flesch, R. (1948). A new readability yardstick. *Journal of applied psychology, 32*(3), 221-233. doi:10.1037/h0057532

Flynn, C. P. (2000). Woman's Best Friend: Pet Abuse and the Role of Companion Animals in the Lives of Battered Women. *Violence Against Women, 6*(2), 162-177. doi:10.1177/10778010022181778

Ford, V. (2012). What role, if any, can companion animals play in recovery from serious mental health difficulties? In: ProQuest Dissertations Publishing.

Fraser, H., & Taylor, N. (2017). In Good Company. *Society & Animals, 25*(4), 341-361. doi:10.1163/15685306-12341450

Friedli, L. (2009). Mental health, resilience and inequalities. In: Copenhagen : WHO Regional Office for Europe:.

Garmezy, N. (1991). Resiliency and Vulnerability to Adverse Developmental Outcomes Associated With Poverty. *The American behavioral scientist (Beverly Hills), 34*(4), 416-430. doi:10.1177/0002764291034004003

Garmezy, N., & Rutter, M. (1985). Acute stress reactions. In M. Rutter & L. Herzov (Eds.), *Child & Adolescent Psychiatry: Modern approaches*. Oxford: Blackwell.

Garrity, T., Stallones, L., Marx, M., & Johnson, T. (1989). Pet Ownership and Attachment as Supportive Factors in the Health of the Elderly. *Anthrozoos, 3*, 35-44. doi:10.2752/089279390787057829

Gelo, O., Braakmann, D., & Benetka, G. (2008). Quantitative and Qualitative Research: Beyond the Debate. *Integrative psychological & behavioral science, 42*(3), 266-290. doi:10.1007/s12124-008-9078-3

Gore, S. (1985). Social support and styles of coping with stress. In S. Cohen & S. L. Syme (Eds.), *Social support and health* (pp. 263-278). Toronto, CA: Academic Press.

Gottlieb, B. H., & Bergen, A. E. (2010). Social support concepts and measures. *Journal of Psychosomatic Research, 69*(5), 511-520. doi:10.1016/j.jpsychores.2009.10.001

Green, J. G., McLaughlin, K. A., Berglund, P. A., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., & Kessler, R. C. (2010). Childhood Adversities and Adult Psychiatric Disorders in the National Comorbidity Survey Replication I: Associations With First Onset of DSM-IV Disorders. *Archives of general psychiatry, 67*(2), 113-123. doi:10.1001/archgenpsychiatry.2009.186

Guéguen, N., & Ciccotti, S. (2008). Domestic Dogs as Facilitators in Social Interaction: An Evaluation of Helping and Courtship Behaviors. *Anthrozoos, 21*(4), 339-349. doi:10.2752/175303708X371564

Guruge, S., Birpreet, B., & Samuels-Dennis, J., A. (2015). Health Status and Health Determinants of Older Immigrant Women in Canada: A Scoping Review. *Journal of aging research, 2015*, 393761-393712. doi:10.1155/2015/393761

Harris, K., Gooding, P., Haddock, G., & Peters, S. (2019). Factors that contribute to psychological resilience to suicidal thoughts and behaviours in people with schizophrenia diagnoses: qualitative study. *BJPsych Open, 5*(5). doi:10.1192/bjo.2019.63

Harris, M. B. (1996). Aggressive experiences and aggressiveness: relationship to ethnicity, gender, and age. *Journal of applied social psychology, 26*(10), 843.

Haskett, M. E., Nears, K., Sabourin Ward, C., & McPherson, A. V. (2006). Diversity in adjustment of maltreated children: Factors associated with resilient functioning. *Clinical Psychology Review, 26*(6), 796-812. doi:10.1016/j.cpr.2006.03.005

Herbell, K., & Zauszniewski, J. A. (2019). Stress Experiences and Mental Health of Pregnant Women: The Mediating Role of Social Support. *Issues in mental health nursing, 40*(7), 613-620. doi:10.1080/01612840.2019.1565873

Herzog, H. (2011). The Impact of Pets on Human Health and Psychological Well-Being: Fact, Fiction, or Hypothesis? *Current Directions in Psychological Science, 20*(4), 236-239. doi:10.1177/0963721411415220

Herzog, H. A. (2007). Gender Differences in Human–Animal Interactions: A Review. *Anthrozoos, 20*(1), 7-21. doi:10.2752/089279307780216687

Hesse-Biber, S. (2010). Emerging Methodologies and Methods Practices in the Field of Mixed Methods Research. *Qualitative inquiry, 16*(6), 415-418. doi:10.1177/1077800410364607

Hill, L., Winefield, H., & Bennett, P. (2020). Are stronger bonds better? Examining the relationship between the human–animal bond and human social support, and its impact on resilience. *Australian psychologist, 55*(6), 729-738. doi:10.1111/ap.12466

Hines, L. M. (2003). Historical Perspectives on the Human-Animal Bond. *The American behavioral scientist (Beverly Hills), 47*(1), 7-15. doi:10.1177/0002764203255206

Hirschman, E. C. (1994). Consumers and Their Animal Companions. *Journal of Consumer Research, 20*(4), 616-632. doi:10.1086/209374

Höltge, J., Mc Gee, S. L., Maercker, A., & Thoma, M. V. (2018). A Salutogenic Perspective on Adverse Experiences. *European Journal of Health Psychology, 25*(2), 53-69. doi:10.1027/2512-8442/a000011

Hosey, G., & Melfi, V. (2014). Human-animal interactions, relationships and bonds: a review and analysis of the literature. *International Journal of Comparative Psychology, 27*(1), 117-142.

House, J. (1981). *Work stress and social support*. Reading, MA: Addison-Wesley Publishing Company.

House, J., Kahn, R., McLeod, J., & Williams, D. (1985). Measures and concepts of social support. In S. Cohen & S. L. Syme (Eds.), *Social support and health* (pp. 83-108): Academic Press.

House, J., Landis, K., R., & Umberson, D. (1988). Social Relationships and Health. *Science (American Association for the Advancement of Science), 241*(4865), 540-545. doi:10.1126/science.3399889

Hu, T., Zhang, D., & Wang, J. (2015). A meta-analysis of the trait resilience and mental health. *Personality and Individual Differences, 76*(C), 18-27. doi:10.1016/j.paid.2014.11.039

Hui Gan, G. Z., Hill, A.-M., Yeung, P., Keesing, S., & Netto, J. A. (2019). Pet ownership and its influence on mental health in older adults. *Aging & mental health*, 1. doi:10.1080/13607863.2019.1633620

IBM. (2016). *IBM SPSS Statistics for Macintosh, Version 24.0.* Armonk, NY: IBM Corp.

Irvine, L. (2004). *If you tame me : understanding our connection with animals*. Philadelphia: Temple University Press.

Islam, A. T. T. (2013). Cat and dog compaionship and well-being: A systematic review. *International Journal of Applied Psychology, 3*(6), 149-155. doi:10.5923/j.ijap.20130306.01

Jakupcak, M., Vannoy, S., Imel, Z., Cook, J. W., Fontana, A., Rosenheck, R., & McFall, M. (2010). Does PTSD moderate the relationship between social support and suicide risk in Iraq and Afghanistan War Veterans seeking mental health treatment? *Depression and anxiety, 27*(11), 1001-1005. doi:10.1002/da.20722

Jensen, J. F., Rauer, A. J., & Volling, B. (2013). A Dyadic View of Support in Marriage: The Critical Role of Men's Support Provision. *Sex roles, 68*(7), 427-438. doi:10.1007/s11199-012-0256-x

Johnson, A., & Bruneau, L. (2019). Chapter 11 - Pets and Relationships: How Animals Help Us Understand Ourselves and Our Connections With Others. In L. Kogan & C. Blazina (Eds.), *Clinician's Guide to Treating Companion Animal Issues* (pp. 173-191): Academic Press.

Johnson, T. P., Garrity, T. F., & Stallones, L. (1992). Psychometric Evaluation of the Lexington Attachment to Pets Scale (Laps). *Anthrozoos, 5*(3), 160-175. doi:10.2752/089279392787011395

Johnston, M. C., Porteous, T., Crilly, M. A., Burton, C. D., Elliott, A., Iversen, L., . . . Black, C. (2015). Physical Disease and Resilient Outcomes: A Systematic Review of Resilience Definitions and Study Methods. *Psychosomatics, 56*(2), 168-180. doi:10.1016/j.psym.2014.10.005

Julius, H., Beetz, A. M., Kotrschal, K., Turner, D. C., Moberg, K., & Julius, H. (2013). *Attachment to pets : an integrative view of human-animal relationships with implications for therapeutic practice*. Cambridge, MA: Hogrefe.

Kabel, A., Khosla, N., & Teti, M. (2015). The Dog Narratives: Benefits of the Human-Animal Bond for Women With HIV. *Journal of HIV/AIDS & social services, 14*(4), 405-416. doi:10.1080/15381501.2013.860069

Kanter, J. W., Puspitasari, A. J., Santos, M. M., & Nagy, G. A. (2012). Behavioural activation: history, evidence and promise. *British Journal of Psychiatry, 200*(5), 361-363. doi:10.1192/bjp.bp.111.103390

Karen, D. L. (2000). Social Support, Negative Social Interactions, and Psychological Well-Being. *The Social service review (Chicago), 74*(2), 231-252. doi:10.1086/514478

Katcher, A., Friedmann, E., Goodman, M., & Goodman, L. (1983). Men, women, and dogs. *California Veterinarian, 2*, 14-16.

Kidd, A. H., & Kidd, R. M. (1989). Factors in adults' attitudes toward pets. *Psychological Reports, 65*, 903-910.

Kim-Cohen, J., & Turkewitz, R. (2012). Resilience and measured gene–environment interactions. *Development and psychopathology, 24*(4), 1297-1306. doi:10.1017/S0954579412000715

Kleiman, E. M., & Liu, R. T. (2013). Social support as a protective factor in suicide: Findings from two nationally representative samples. *Journal of affective disorders, 150*(2), 540-545. doi:10.1016/j.jad.2013.01.033

Krause-Parello, C. A. (2012). Pet Ownership and Older Women: The Relationships Among Loneliness, Pet Attachment Support, Human Social Support, and Depressed Mood. *Geriatric Nursing, 33*(3), 194-203. doi:http://dx.doi.org/10.1016/j.gerinurse.2011.12.005

Lakey, B., & Cronin, A. (2008). Chapter 17 - Low Social Support and Major Depression: Research, Theory and Methodological Issues. In K. S. Dobson & D. J. A. Dozois (Eds.), *Risk Factors in Depression* (pp. 385-408). San Diego: Elsevier.

Langford, C. P. H., Bowsher, J., Maloney, J. P., & Lillis, P. P. (1997). Social support: a conceptual analysis. *Journal of advanced nursing, 25*(1), 95-100. doi:10.1046/j.1365-2648.1997.1997025095.x

Langston, S. (2019). Chapter 7 - Pets and the Therapeutic Process. In L. Kogan & C. Blazina (Eds.), *Clinician's Guide to Treating Companion Animal Issues* (pp. 115-127): Academic Press.

Lemay, R., & Ghazal, H. (2001). Resilience and positive psychology: Finding hope. *Child & Family, 5*(1), 10-21.

Levinson, B. M. (1969). *Pet-oriented child psychotherapy*. Springfield, IL: Charles C. Thomas.

Liu, D. W. Y. (2015). An exploration of individual level of resilience and suicidality across three age groups in males and females living in the community. In K. Fairweather-Schmidt, R. M. Roberts, R. Burns, & K. Anstey (Eds.).

Lowe, S. R., Rhodes, J. E., Zwiebach, L., & Chan, C. S. (2009). The impact of pet loss on the perceived social support and psychological distress of hurricane survivors. *J Trauma Stress, 22*(3), 244-247. doi:10.1002/jts.20403

Luthar, S., & Zigler, E. (1991). Vulnerability and Competence: A Review of Research on Resilience in Childhood. *Am J Orthopsychiatry, 61*(1), 6-22.

Luthar, S. S., Cicchetti, D., & Becker, B. (2000). The Construct of Resilience: A Critical Evaluation and Guidelines for Future Work. *Child Development, 71*(3), 543-562.

Luthar, S. S., Doernberger, C. H., & Zigler, E. (1993). Resilience is not a unidimensional construct: Insights from a prospective study of inner-city adolescents. *Development and psychopathology, 5*(4), 703-717. doi:10.1017/S0954579400006246

Ma, D. Y., Chang, W. H., Chi, M. H., Tsai, H. C., Yang, Y. K., & Chen, P. S. (2016). The correlation between perceived social support, cortisol and brain derived neurotrophic factor levels in healthy women. *Psychiatry research, 239*, 149-153. doi:10.1016/j.psychres.2016.03.019

Martens, P., Enders-Slegers, M.-J., & Walker, J. K. (2016). The Emotional Lives of Companion Animals: Attachment and Subjective Claims by Owners of Cats and Dogs. *Anthrozoos, 29*(1), 73-88. doi:10.1080/08927936.2015.1075299

Martin, W., Dixon, B. J., & Thomas, H. (2017). Enhancing Mental Well-Being. In C. L. Cooper & J. C. Quick (Eds.) *The handbook of stress and health: A guide to research and practice* (pp. 459-471). Chichester, UK: John Wiley & Sons, Ltd.

Masten, A. (1994). Resilience in individual development: Successful adaptation despite risk and adversity. In M. C. Wang & E. W. Gordon (Eds.), *Educational resilience in inner city America: Challenge and prospects*. Hilldale, NJ: Erlbaum.

Masten, A. (2014). *Ordinary magic: resilience in development*. New York, NY: Guilford Press.

Masten, A., & Obradović, J. (2006). Competence and Resilience in Development. *Annals of the New York Academy of Sciences, 1094*(1), 13-27. doi:10.1196/annals.1376.003

McCardle, P., McCune, S., Griffin, J., & Maholmes, V. (2011). *How animals affect us: Examining the influences of human-animal interaction on child development and human health.* Washington, DC, US: American Psychological Association; US. doi:https://doi.org/10.1037/12301-000

McConnell, A., Brown, C., Shoda, T., Stayton, L., & Martin, C. (2011). Friends with benefits: on the positive consequences of pet ownership. *J Pers Soc Psychol, 101*(6), 1239-1252. doi:10.1037/a0024506

McLean, J., Maxwell, M., Platt, S., Harris, F., & Jepson, R. (2008). *Risk and protective factors for suicide and suicidal behaviour: A literature review*. The Scottish Government. Retrieved from : https://dspace.stir.ac.uk/bitstream/1893/2206/1/Suicide%20review%5B1%5D.pdf

McNicholas, J., & Collis, G. (2006). Animals as social supporters. Insights for understanding animal-assisted therapy. In A. Fine (Ed.), *A handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice*. (pp. 49-71), San Diego, CA: Elsevier.

McNicholas, J., Gilbey, A., Rennie, A., Ahmedzai, S., Dono, J. A., & Ormerod, E. (2005). Pet ownership and human health: a brief review of evidence and issues. *BMJ, 331*(7527), 1252-1254. doi:10.1136/bmj.331.7527.1252

Meehan, M., Massavelli, B., & Pachana, N. (2017). Using Attachment Theory and Social Support Theory to Examine and Measure Pets as Sources of Social Support and Attachment Figures. *Anthrozoos, 30*(2), 273-289. doi:10.1080/08927936.2017.1311050

Moss, G. E. (1973). *Illness, immunity, and social interaction : the dynamics of biosocial resonation*. New York: Wiley.

Muraco, A., Putney, J., Shiu, C., & Fredriksen-Goldsen, K. I. (2018). Lifesaving in Every Way: The Role of Companion Animals in the Lives of Older Lesbian, Gay, Bisexual, and Transgender Adults Age 50 and Over. *Research on aging, 40*(9), 859-882. doi:10.1177/0164027517752149

Netting, Wilson, C. C., Goodie, J. L., Stephens, M. B., Byers, C. G., & Olsen, C. H. (2013). Attachment, social support, and perceived mental health of adult dog walkers: What does age have to do with it? *Journal of Sociology and Social Welfare, 40*(4), 261-283.

Netting, F., Wilson, C., & New, J. (1987). The Human-Animal Bond: Implications for Practice. *Social Work, 32*(1), 60. doi:10.1093/sw/32.1.60

Netting, F., Wilson, C. C., Goodie, J. L., Stephens, M. B., Byers, C. G., & Olsen, C. H. (2013). Attachment, social support, and perceived mental health of adult dog walkers: What does age have to do with it? *Journal of Sociology and Social Welfare, 40*(4), 261-283.

O'Dwyer, L., & Thompson, K. (2018). Attachment, Bushfire Preparedness, Planning, and Response among Animal Guardians: A South Australian Case Study. *PLoS currents, 10*. doi:10.1371/currents.dis.f659ce48594ea47f5a20de03e9dfa43a

O'Haire, M. (2010). Companion animals and human health: Benefits, challenges, and the road ahead. *Journal of Veterinary Behavior: Clinical Applications and Research, 5*(5), 226-234. doi:http://dx.doi.org/10.1016/j.jveb.2010.02.002

Ory, M. G., & Goldberg, E. L. (1983). Pet Possession and Well-Being in Elderly Women. *Research on aging, 5*(3), 389-409. doi:10.1177/0164027583005003007

Pachana, N. A., Ford, J. H., Andrew, B., & Dobson, A. J. (2005). Relations between companion animals and self-reported health in older women: Cause, effect or artifact?

International Journal of Behavioral Medicine, 12(2), 103-110. doi:https://doi.org/10.1207/s15327558ijbm1202_8

Pallant, J. F. (2016). *SPSS survival manual : A step by step guide to data analysis using IBM SPSS*. Routledge. doi:https://doi.org/10.1111/1753-6405.12166

Panter-Brick, C., & Leckman, J. F. (2013). Editorial Commentary: Resilience in child development – interconnected pathways to wellbeing. *Journal of child psychology and psychiatry, 54*(4), 333-336. doi:10.1111/jcpp.12057

Parslow, R. A., Jorm, A. F., Christensen, H., Rodgers, B., & Jacomb, P. (2005). Pet ownership and health in older adults: Findings from a survey of 2,551 community-based australians aged 60-64. *Gerontology, 51*(1), 40-47.

Peacock, J., Chur-Hansen, A., & Winefield, H. (2012). Mental Health Implications of Human Attachment to Companion Animals. *Journal of Clinical Psychology, 68*(3), 292-303. doi:10.1002/jclp.20866

Pejičić, M., Ristić, M., & Anđelković, V. (2018). The mediating effect of cognitive emotion regulation strategies in the relationship between perceived social support and resilience in postwar youth. *Journal of Community Psychology, 46*(4), 457-472. doi:10.1002/jcop.21951

Podberscek, A. L. (2006). Positive and Negative Aspects of Our Relationship with Companion Animals. *Veterinary research communications, 30*(S1), 21-27. doi:10.1007/s11259-006-0005-0

Prato-Previde, E., Fallani, G., & Valsecchi, P. (2006). Gender Differences in Owners Interacting with Pet Dogs: An Observational Study. *Ethology, 112*(1), 64-73. doi:10.1111/j.1439-0310.2006.01123.x

Productivity Commission. (2019). *Mental Health*. Retrieved from Canberra: https://www.pc.gov.au/inquiries/completed/mental-health#report

Pruchno, R., Heid, A. R., & Wilson-Genderson, M. (2018). Successful Aging, Social Support, and Ownership of a Companion Animal. *Anthrozoos, 31*(1), 23-39. doi:10.1080/08927936.2018.1406199

Purewal, R., Christley, R., Kordas, K., Joinson, C., Meints, K., Gee, N., & Westgarth, C. (2017). Companion Animals and Child/Adolescent Development: A Systematic Review of the Evidence. *Int. J. Environ. Res. Public Health, 14*(3). doi:10.3390/ijerph14030234

Putney, J. M. (2013). Relational Ecology: A Theoretical Framework for Understanding the Human-Animal Bond. *Journal of Sociology and Social Welfare, 40*(4), 57-80.

Quinn, A. (2005). An examination of the relations between human attachment, pet attachment, depression, and anxiety. In L. Larson (Ed.): ProQuest Dissertations Publishing.

Ramírez, M. T. G., Quezada Berumen, L. d. C., & Hernández, R. L. (2014). Psychometric Properties of the Lexington Attachment to Pets Scale: Mexican Version (LAPS-M). *Anthrozoos, 27*(3), 351-359. doi:10.2752/175303714X13903827487926

Richardson, G. E. (2002). The metatheory of resilience and resiliency. *Journal of Clinical Psychology, 58*(3), 307-321. doi:10.1002/jclp.10020

Risley-Curtiss, C., Holley, L. C., Cruickshank, T., Porcelli, J., Rhoads, C., Bacchus, D. N. A., . . . Murphy, S. B. (2006). "She was family" women of color and animal-human connections. *Affilia Journal of Women and Social Work, 21*(4), 433.

Rook, K. S. (1984). The negative side of social interaction: Impact on Psychological Wellbeing. *Journal of Personality and Social Psychology, 46*(5), 1097-1108.

Russow, L. M. (2002). Ethical Implications of the Human-Animal Bond in the Laboratory. *ILAR journal, 43*(1), 33-37. doi:10.1093/ilar.43.1.33

Rutten, B. P. F., Hammels, C., Geschwind, N., Menne-Lothmann, C., Pishva, E., Schruers, K., . . . Wichers, M. (2013). Resilience in mental health: linking psychological and neurobiological perspectives. *Acta Psychiatrica Scandinavica, 128*(1), 3-20. doi:10.1111/acps.12095

Rutter, M. (1985). Resilience in the Face of Adversity: Protective Factors and Resistance to Psychiatric Disorder. *British Journal of Psychiatry, 147*(6), 598-611. doi:10.1192/bjp.147.6.598

Rutter, M. (1993). Resilience: Some conceptual considerations. *Journal of adolescent health, 14*(8), 626-631. doi:10.1016/1054-139X(93)90196-V

Rutter, M. (1999). Resilience concepts and findings: implications for family therapy. *Journal of family therapy, 21*(2), 119-144. doi:10.1111/1467-6427.00108

Sable, P. (1991). Attachment, Loss of Spouse, and Grief in Elderly Adults. *Omega: Journal of Death and Dying, 23*(2), 129-142. doi:10.2190/PU6V-H0NW-61NY-1W5G

Sable, P. (2013). The Pet Connection: An Attachment Perspective. *Clinical Social Work Journal, 41*(1), 93-99. doi:10.1007/s10615-012-0405-2

Sachs-Ericsson, N., Hansen, N. K., & Fitzgerald, S. (2002). Benefits of assistance dogs: A review. *Rehabilitation psychology, 47*(3), 251-277. doi:10.1037//0090-5550.47.3.251

Saldaña, J. (2013). *The coding manual for qualitative researchers* (2nd ed. ed.). Los Angeles: SAGE.

Saunders, J., Parast, L., Babey, S., & Miles, J. (2017). Exploring the differences between pet and non-pet owners: Implications for human-animal interaction research and policy. *PLoS One, 12*(6), e0179494. doi:10.1371/journal.pone.0179494

Seery, M. D., Holman, E. A., & Silver, R. C. (2010). Whatever Does Not Kill Us: Cumulative Lifetime Adversity, Vulnerability, and Resilience. *Journal of Personality and Social Psychology, 99*(6), 1025-1041. doi:10.1037/a0021344

Seligman, M. E. P. (2011). *Flourish : a visionary new understanding of happiness and well-being*. New York: Free Press.

Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive Psychology: An Introduction. *The American Psychologist, 55*(1), 5-14. doi:10.1037/0003-066X.55.1.5

Serpell, J. (2011). Historical and cultural perspectives on human-pet interactions. In P. McCardle, M. McCune, J. A. Griffin, L. Esposito, & L. Freund (Eds.), *Animals in our lives: Human-animal interaction in family, community and therapeutic settings.* (pp. 11-22). Baltimore, MY: Paul H. Brookes Publishing.

Shapiro, K., & DeMello, M. (2010). The State of Human-Animal Studies. *Society & Animals, 18*(3), 307-318. doi:10.1163/156853010X510807

Shiloh, S., Sorek†, G., & Terkel, J. (2003). Reduction of state-anxiety by petting animals in a controlled laboratory experiment. *Anxiety, stress, and coping, 16*(4), 387-395. doi:10.1080/1061580031000091582

Shir-Vertesh, D. (2012). "Flexible Personhood": Loving Animals as Family Members in Israel. *American anthropologist, 114*(3), 420-432. doi:10.1111/j.1548-1433.2012.01443.x

Siegel, J. M., Angulo, F. J., Detels, R., Wesch, J., & Mullen, A. (1999). AIDS diagnosis and depression in the Multicenter AIDS Cohort Study: the ameliorating impact of pet ownership. *AIDS Care, 11*(2), 157-170. doi:10.1080/09540129948054

Smolkovic, I., Fajfar, M., & Mlinaric, V. (2012). Attachment to pets and interpersonal relationships: Can a four-legged friend replace a two-legged one? *Journal of European Psychology Students, 3*(1), 15-23. doi:10.5334/jeps.ao

Southwick, S., Bonanno, G. A., Masten, A. S., Panter-Brick, C., & Yehuda, R. (2014). Resilience definitions, theory, and challenges: interdisciplinary perspectives. *European Journal of Psychotraumatology, 5*(1), 25338. doi:10.3402/ejpt.v5.25338

Southwick, S., & Charney, D. (2012). *Resilience : The Science of Mastering Life's Greatest Challenges*. Cambridge: Cambridge: Cambridge University Press.

Southwick, S., & Charney, D. (2018). *Resilience : the science of mastering life's greatest challenges* (Second edition. ed.). Cambridge: Cambridge University Press. doi:https://doi.org/10.1017/9781108349246.002

Southwick, S., Douglas-Palumberi, H., & Pietrzak, R. H. (2014). Resilience. In M. J. Friedman, T. M. Keane, & P. A. Resick (Eds.), *Handbook of PTSD, Second Edition : Science and Practice* (2nd ed.). New York, United States: Guilford Publications.

Staats, S., Wallace, H., & Anderson, T. (2008). Reasons for Companion Animal Guardianship (Pet Ownership) from Two Populations. *Society & Animals, 16*(3), 279-291. doi:10.1163/156853008X323411

Stallones, L., Johnson, T. P., Garrity, T. F., & Marx, M. B. (1990). Quality of attachment to companion animals among U.S. adults 21 to 64 years of age. *Anthrozoos, 3*(3), 171-176. doi:10.2752/089279391787057206

Suwankhong, D., & Liamputtong, P. (2016). Social Support and Women Living With Breast Cancer in the South of Thailand. *Journal of Nursing Scholarship, 48*(1), 39-47. doi:10.1111/jnu.12179

Teismann, T., Forkmann, T., Brailovskaia, J., Siegmann, P., Glaesmer, H., & Margraf, J. (2018). Positive mental health moderates the association between depression and suicide ideation: A longitudinal study. *International Journal of Clinical and Health Psychology, 18*(1), 1-7. doi:10.1016/j.ijchp.2017.08.001

Thoits, P. A. (1986). Social support as coping assistance. *Journal of Consulting and Clinical Psychology, 54*(4), 416-423.

Tracy, S. J. (2010). Qualitative Quality: Eight “Big-Tent” Criteria for Excellent Qualitative Research. *Qualitative inquiry, 16*(10), 837-851. doi:10.1177/1077800410383121

Turner, S. F., Cardinal, L. B., & Burton, R. M. (2017). Research Design for Mixed Methods: A Triangulation-based Framework and Roadmap. *Organizational research methods, 20*(2), 243-267. doi:10.1177/1094428115610808

Vaux, A. (1988). *Social support: Theory, research, and intervention.* New York, NY: Praeger Publishers.

Vitztum, C. (2013). Human–Animal Interaction: A Concept Analysis. *International Journal of Nursing Knowledge, 24*(1), 30-36. doi:10.1111/j.2047-3095.2012.01219.x

Walsh, F. (2009). Human-Animal Bonds I: The Relational Significance of Companion Animals. *Family process, 48*(4), 462-480. doi:10.1111/j.1545-5300.2009.01296.x

Wells, D. L. (2004). The facilitation of social interactions by domestic dogs. *Anthrozoos, 17*(4), 340-352. doi:10.2752/089279304785643203

Wells, D. L. (2009). The effects of animals on human health and well-being. *Journal of Social Issues, 65*(3), 523-543.

Wells, M. (2009). Resilience in Rural Community-Dwelling Older Adults. *Journal of Rural Health, 25*(4), 415-419. doi:10.1111/j.1748-0361.2009.00253.x

Wells, Y., & Rodi, H. (2000). Effects of pet ownership on the health and well-being of older people. *Australasian Journal of Ageing, 19*(3), 143-148. doi:10.1111/j.1741-6612.2000.tb00167.x

Wiens, V., Kyngäs, H., & Pölkki, T. (2016). The meaning of seasonal changes, nature, and animals for adolescent girls' wellbeing in northern Finland: A qualitative descriptive study. *International journal of qualitative studies on health and well-being, 11*(1), 30160-30160. doi:10.3402/qhw.v11.30160

Wills, T. A. (1991). Social support and interpersonal relationships. In M. S. Clark (Ed.), *Review of personality and social psychology* (Vol. 12, pp. 265-289): Sage Publications, Inc.

Wills, T. A., & Bantum, E. O. C. (2012). Social Support, Self-Regulation, and Resilience in Two Populations: General-Population Adolescents and Adult Cancer Survivors. *Journal of Social & Clinical Psychology, 31*(6), 568-592. doi:10.1521/jscp.2012.31.6.568

Winchester, S. (2013). *New questions, multiple meanings: Exploring attachment theory, self psychology, and anti-oppression perspectives on human-companion animal relationships in the rural West: A theoretical study.* (Masters Thesis), Smith College Northampton, Massachusetts. Retrieved from https://fcaw.library.umass.edu/F/?func=direct&doc_number=013419634&doc_library=FCL01

Windle, G. (2011). What is resilience? A review and concept analysis. *Reviews in Clinical Gerontology, 21*(02), 152-169. doi:doi:10.1017/S0959259810000420

Winefield, H., Black, A., & Chur-Hansen, A. (2008). Health effects of ownership of and attachment to companion animals in an older population. *International Journal of Behavioral Medicine, 15*(4), 303-310. doi:10.1080/10705500802365532

Wisdom, J., & Creswell, J. W. (2013). *Integrating quantitative and qualitative data collection and analysis while studying patient-centered medical home models.* Rockville, MD: Agency for Healthcare Research and Quality.

World Health Organization. (2012). *Risks to mental health: An overview of vulnerabilities and risk factors*. Retrieved from https://www.who.int/mental_health/mhgap/risks_to_mental_health_EN_27_08_12.pdf:

World Health Organization. (2014). *Preventing Suicide A Global Imperative*. Geneva: World Health Organization. Retrieved from: https://www.who.int/mental_health/suicide-prevention/world_report_2014/en/

World Health Organization. (2018). *Mental Health: Strengthening our response.* Retrieved from https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response

Xu, Y., & Burleson, B. R. (2001). Effects of Sex, Culture, and Support Type on Perceptions of Spousal Social Support: An Assessment of the "Support Gap" Hypothesis in Early Marriage. *Human communication research, 27*(4), 535-566. doi:10.1111/j.1468-2958.2001.tb00792.x

Yehuda, R., Daskalakis, N. P., Desarnaud, F., Makotkine, I., Lehrner, A. L., Koch, E., . . . Bierer, L. M. (2013). Epigenetic Biomarkers as Predictors and Correlates of Symptom Improvement Following Psychotherapy in Combat Veterans with PTSD. *Frontiers in psychiatry, 4*, 118-118. doi:10.3389/fpsyt.2013.00118

Yoshikawa, H., Weisner, T. S., Kalil, A., & Way, N. (2008). Mixing Qualitative and Quantitative Research in Developmental Science: Uses and Methodological Choices. *Developmental psychology, 44*(2), 344-354. doi:10.1037/0012-1649.44.2.344

Zadravec Šedivy, N., Podlogar, T., Kerr, D. C. R., & De Leo, D. (2017). Community social support as a protective factor against suicide: A gender-specific ecological study of 75 regions of 23 European countries. *Health & place, 48*, 40-46. doi:10.1016/j.healthplace.2017.09.004

Zilcha-Mano, S., Mikulincer, M., & Shaver, P. R. (2011). An attachment perspective on human–pet relationships: Conceptualization and assessment of pet attachment orientations. *Journal of Research in Personality, 45*(4), 345-357. doi:10.1016/j.jrp.2011.04.001

Zimet, G., Dahlem, N., Zimet, S., & Farley, G. (1988). The Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment, 52*(1), 30-41. doi:10.1207/s15327752jpa5201_2

Zimet, G., Powell, S., Farley, G., Werkman, S., & Berkoff, K. (1990). Psychometric Characteristics of the Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment, 55*(3-4), 610-617. doi:10.1080/00223891.1990.9674095

Zimolag, U., & Krupa, T. (2010). The Occupation of Pet Ownership as an Enabler of Community Integration in Serious Mental Illness: A Single Exploratory Case Study. *Occupational Therapy in Mental Health, 26*(2), 176-196. doi:10.1080/01642121003736101

Zimolag, U. U., & Krupa, T. (2009). Pet ownership as a meaningful community occupation for people with serious mental illness.(Report). *AJOT: American Journal of Occupational Therapy, 63*(2), 126. doi:10.5014/ajot.63.2.126

Zuckerman, M. (1999). *Vulnerability to psychopathology : a biosocial model*. Washington: American Psychological Association. doi: 10.1037/10316-000