THE IMPACT OF ANXIETY, DEPRESSION, AND COGNITIVE FACTORS ASSOCIATED WITH ANXIETY, ON EVERYDAY RISK TAKING BEHAVIOUR.

A thesis presented in partial fulfilments for the degree of

Doctor of Clinical Psychology

at

Massey University – Wellington, New Zealand

by

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2012

MASSEY UNIVERSITY
GRADUATE RESEARCH SCHOOL

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ABSTRACT

Research into risk taking behaviour (RTB) reveals that depression and anxiety (in particular) are associated with risk aversive behaviour, for many different types of risks, including gambling, simulated risk taking tasks, and everyday risks. There has, however, been little research into the relationship between cognitive factors associated with anxiety, and RTB. This is in spite of research in this area finding that perceived risk had a stronger relationship with a cognitive factor (worry) than with anxiety.

The present research is investigating the everyday RTB associated with depression, anxiety, and cognitive factors associated with anxiety. Everyday risks are the type of risks being investigated as these are decisions people make on a daily basis that involve risk that cannot easily be avoided, and being overly avoidant of these risks can lead to negative consequences.

This research is split into two studies, with the first study split into two sections. The first part of study one is the continued development of a measure of everyday RTB across multiple domains. All existing measures of everyday RTB either do not measure RTB in different domains, or have psychometric problems. Therefore, the development of a measure suitable for use in this research project is required. The second part of the first study is investigating the relationships of anxiety and depression level with everyday RTB, across multiple domains. Study one used three samples, New Zealand community and tertiary student samples, and an international internet sample. The second study is investigating the relationship between cognitions associated with anxiety (e.g. worry and metaworry) and everyday RTB. This study used two samples, a New Zealand tertiary student sample, and an international internet sample.

Results from the development of the everyday risk taking measure indicate that the measure that underwent further development, the Everyday Risk Inventory – Expanded (ERI-E) is a reliable measure of everyday RTB, for general community samples in particular. Cronbach's alpha values for the community sample were all above 0.7, but in some domains for the student sample were just below 0.6. Confirmatory factor analysis showed the fit for both the multiple domain and single domain models were moderate to good.

Results from the second part of study 1 showed that the relationships of anxiety and depression, with everyday RTB were weak, with few significant results from either correlational or multiple regression analysis. In particular, depression has a minimal impact on RTB. Sociodemographic factors, particularly age, gender and income had more significant impacts on everyday RTB, with people on lower income, and older people, being risk averse. Gender differences varied

between domains, with females significantly more risk averse for risks involving personal danger and risks to others.

The concept that differences in people's sense of power within their society affects RTB was supported, as in general socio-demographic differences associated with increased power (e.g. higher income and being male) led to people being less risk averse.

Results from study two showed that everyday RTB has a stronger association with cognitive factors associated with anxiety than to anxiety level. In particular it has high correlations with worry and intolerance of uncertainty (IU). Structural equation modelling found that a model with cognitive factors leading to anxiety and differences in everyday RTB was an almost perfect fit for the model, and anxiety had no direct effect on RTB. It was also found that the relationship between everyday RTB and cognitive factors was stronger for high anxiety levels than low anxiety levels. Further research is required to determine the reason why cognitive factors associated with anxiety affect everyday RTB, rather than anxiety level.

The present research contributes to knowledge in this area by showing that cognitive factors impact on RTB, rather than anxiety level. It also found that socio-demographic characteristics, particularly age, were more important in explaining differences in RTB than was found in previous research.

ACKNOWLEDGMENTS

The completion of this thesis has been the result of the support of many people. Most importantly my wife Odette who has supported me in numerous ways throughout the process. Another valuable means of support has been the fellow students in the CHERUBS lab (too numerous to mention) and my fellow clinical students (particularly Heidi, Kiri and Uvonne), who through travelling along the same path have made me not feel so isolated.

I also want to thank my supervisors for their support. Steve, Ruth and Janet have supported me in producing the final product that both them (and I at times) thought might never happen. In particular Steve for his statistical knowledge and perseverance at reading my often not well articulated writing. Also to Harvey Jones for his help in setting up the website for the internet sample, and sending me the data so promptly.

I also want to thank Massey University for the scholarship that helped reduce the financial hardship of study, and for Karl Pajo from the ethics committee for helpful suggestions that made that part of the process easier. Also the lecturers who agreed to let me distribute questionnaires in their classes, and the students who filled them in.

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1. Project Introduction

A person being overly concerned about risk causes them to worry unnecessarily, and those who are overly avoidant of risk miss out on many opportunities to gain pleasure in their lives (Tulloch & Lupton, 2003). They also miss out on the opportunity to show environmental mastery, an important component of being psychologically well (Ryff, 1995), and miss out on opportunities to be happy and have a full life that comes from undertaking pleasurable activities and engaging with the world around them (Peterson, Park & Seligman, 2005). Given the negative impact of being overly avoidant of risk, and models of psychopathology that show that people who are risk avoidant are more likely to be depressed or anxious (Maner et al., 2007), it is important to understand the nature of this risk avoidance so it can be targeted in therapy. This is to both reduce the level of anxiety of people in taking everyday risks, and also enable them to gain a sense of achievement in dealing with a world they may perceive as dangerous.

Everyday risk taking is the type of risk studied in this research, and involves situations people encounter on a regular basis and which requires them to weigh up risks and benefits before deciding the option they prefer to take (Pietromonaco & Rook, 1987). The construct of everyday risk taking behaviour (RTB) has been used in previous research, with some research assuming people have a propensity to be either risk taking or risk averse for everyday risks generally, and other research assessing whether people are risk taking or risk averse for different types of everyday risk. Most research shows that people will show different patterns of RTB for different types of risks, including everyday risks (Butler and Mathews, 1983; Loewenstein, Weber, Hsee & Welch, 2001; Soane and Chmiel, 2005), but measures used often treat everyday RTB as a single construct.

Previous research has assessed the relationship between anxiety, depression and everyday RTB, and has generally found that people who have some level of anxiety or depression are risk avoidant, particularly anxious people (Maner & Schmidt, 2006; Nesse & Klaas, 1994; Pietromonaco & Rook, 1987). Levels of anxiety and depression are classified as being normal, mild, moderate, and severe, and this is the levels of anxiety which will be used in this research. There has been little research however on the different types of everyday risks people who have some level of anxiety and depression will avoid taking in their everyday lives. The research that has been conducted shows that people are likely to avoid some risks more than others, and there may be a differential effect on people's well being, dependent on the type of risks they avoid,

particularly those who avoid taking social risks (Pietromonaco & Rook, 1987). There has also been little research into the factors that contribute to people who are anxious and depressed avoiding risk. There are many possible reasons for the observed relationships, with cognitive factors (such as worry) having been shown to be important is some research (Kobbeltved, Brun, Johnsen & Eid, 2005; Loewenstein et al., 2001).

Avoidance of everyday risk by people with some level of anxiety or depression may be because they avoid risk once they are anxious or depressed, or risk avoidance may precede the onset of anxiety and depression, and is due to the underlying cognitions associated with anxiety and depression, such as excessive worry and maladaptive schema. In other words, cognitive factors lead to both anxiety and depression, and to changes in RTB, but the relationship between RTB and anxiety/depression is weak.

Worry is the only cognitive factor whose effect on risk has been studied. This research found that worry made people sensitive to the possibility of negative consequences of taking risks (Loewenstein et al., 2001), and the causal chain was from perceived risk to feeling of worry, then to emotional distress (i.e. anxiety or depression) (Kobbeltved et al., 2005). Also, a relationship between cognitive factors associated with anxiety/depression and risk taking has been predicted by some cognitive models. For example Beck's schema theory proposes that depressed people view the world as a dangerous place (Beck, 1967), and anxious people find the world unpredictable (Beck, 1976).

The overall aim of the current project is to better understand how everyday RTB is affected by both symptoms and cognitive factors associated with anxiety and depression. This involves researching the relationships between the levels of anxiety and depression and everyday RTB, and also the relationship of cognitive factors associated with these constructs (most specifically those associated with anxiety) with RTB. This will advance research in two main areas, the domain specific (for everyday risks) risk averse behaviour which is associated with anxiety and depression, and the relationship between cognitive factors associated with anxiety and everyday RTB.

1.1 Outline of Research

The research project will consist of two studies, with the first study comprising two separate components. The first study investigates the relationships of anxiety and depression to everyday RTB, both generally, and in specific domains, such as health risks and social risks. The second study investigates the relationship between everyday RTB and cognitive factors associated with levels of anxiety and depression. The second study is an extension of the first study,

investigating an additional component of the anxiety/depression – RTB relationship (cognitive factors) which has not been adequately researched.

The first component of study one will be developing a suitable measure of everyday RTB in multiple domains. There have many different questionnaires used to measure everyday RTB, but all existing questionnaires of RTB have some weaknesses, such as problems with reliability of scales, suitability for a general population, and having no separate domain scales.

The aim of the second component of the first study is to better understand the everyday risk taking behaviour of people who have some level of anxiety or depression, such as is found in non-clinical populations. Research into the avoidance of everyday risks by people who are anxious or depressed has not adequately researched which specific types of risks are avoided by these groups. This is in spite of some theories predicting there will be differences, such as the social risk hypothesis of depression, an evolutionary theory for depression that predicts depressed people will avoid taking social risks. (Allen & Badcock, 2003).

This study will use three different samples, New Zealand community, and tertiary student samples, and an international internet sample. Levels of anxiety and depression will be determined by responses to a psychometric measure, the Depression Anxiety and Stress Scale (DASS-21) (Lovibond & Lovibond, 1993).

The aim of the second study is to investigate the relationships between cognitions associated with psychological distress and RTB, particularly cognitions associated with anxiety. A number of cognitive models of depression and various types of anxiety disorders include constructs that by their definitions appear closely related to risk taking in everyday life. An example is intolerance of uncertainty (IU), in which people consider it unacceptable that even the small chance of a negative event occurring is unacceptable (Ladouceur et al., 1999), meaning they are likely to avoid taking risks. High levels of worry have also been associated with people being risk averse (Kobbeltved et al., 2005). It is possible that people being overly avoidant of the risks of everyday life is one way in which these cognitions are manifested in their daily lives, and is therefore a potential area for therapeutic intervention.

Anxious people being risk averse has been well researched, but whether this is a behavioural consequence of suffering from some level of anxiety, or a consequence of cognitive factors that predispose people to experiencing anxiety, is uncertain. This study will also help determine whether there are differences in the domains in which these cognitive factors are important predictors of risk aversion. This research will use an international internet sample and a New Zealand tertiary student sample. Measures used will be those for cognitive factors identified

from an analysis of cognitive models of anxiety, as well as the DASS-21, and the everyday RTB measure developed in the first study.

1.2 Significance of Research

This research aims to contribute to the existing literature in the following ways. Firstly, the development of an improved measure of everyday RTB, that is suitable for a wide range of populations, and measures RTB in a number of domains. Secondly, an improved understanding of RTB in different domains of people with some level of anxiety and depression, rather than these people being considered as either risk taking or risk averse generally. Thirdly it will provide a better understanding of the relationships between risk taking and cognitions associated with anxiety, and whether RTB has a closer association with the cognitive factors that predispose people to having anxiety disorders, or with the symptoms associated with people experiencing anxiety, such as increased heart rate and rapid breathing, that measures of anxiety typically measure.

1.3 Relevance of Study to Clinical Psychology

If people who are anxious and depressed avoid everyday risks, then the measure which is developed in the first study, can be used as a source of information on the risks that people avoid, which could form the basis for activating risk averse people to become less risk avoidant. Also, behavioural activation has been shown to be important in reducing depressive symptoms (Cuijpers, Van Straten & Warmerdam, 2007), and is a key focus of homework in CBT. Identifying areas where people avoid risk could form the basis of homework for anxious and depressed people. Clients could be assigned tasks involving taking some form of everyday risk taking which they felt would cause negative consequences (including their emotional reaction to taking risks). The following session could then review the impact of taking risks, and any benefits they perceived from doing so.

Chapter 2: Development of a Measure to be used in Undertaking Research into Everyday Risk Taking

2.1 Introduction

There are a wide range of measures that have been used in the general area of risk research, but few that specifically measure everyday risk taking behaviour (RTB). The issues in selecting an appropriate measure for use in the present research are threefold: the lack of consistency in what the existing measures actually measure; uncertainty about whether risk taking is a multidomain construct; and if it is a multidomain construct, then what are the domains?

The first issue is that there are a confusingly large number of terms used to describe what appear to be essentially the same aspects of risk taking. Before an analysis of the existing measures is undertaken it is necessary to make sense of the terminology used in existing risk research, and existing measures. Particularly important in the present research is the relevance of these terms in referring to everyday RTB.

The second issue is that there is no consistency over whether everyday risk taking is a single or multidomain construct. Generally measures have treated it as a single construct, but there is evidence that people are not consistent in their risk taking, varying depending on the type of risk they are considering undertaking (Butler & Mathews, 1983; Loewenstein et al., 2001; Soane & Chmiel, 2005).

The third issue is the unsuitability of many measures in the broad area of risk research for assessing RTB. A number assess many different types of risk taking, but also behaviours that may not be seen as involving risk taking, such as boredom susceptibility, which measures aversion to any kind of monotonous condition (Zuckerman, 1979). Questions are also often targeted towards the particular sample of interest, and have limited generalisability. These include those aimed as specific age groups, such as young adults (Gullone & Moore, 2000), and specific groups of participants, such as business managers (Weber, Blais & Betz, 2002). This means they contain items that are irrelevant to many people, such as questions regarding people's preferences when investing money, when many people do not have money to invest.

These three issues will be discussed in order. An analysis of the strengths and weaknesses of existing measures will be undertaken in order to assist in developing a measure that is suitable for use in this research.

2.1.1. Terminology Used in Risk Research

One of the difficulties in working in the area of risk research is the vast array of terms used to describe various facets of risk. Risk attitude (Rohrmann, 2002), risk preference (Levin & Hart, 2003), risk perception (e.g. Sjöberg, 2003), risk bearing (Nicholson, Soane, Fenton-O'Creevy & Willman, 2005), sensation seeking (Zuckerman, 2007), risk taking (Gullone & Moore, 2000), risk propensity (Nicholson et al., 2005), and risk behaviour (Horvath & Zuckerman, 1993), are just some of the terms used.

Risk attitude is a generic orientation towards taking or avoiding a risk when deciding how to proceed in situations with an uncertain outcome (Rohrmann, 2002), and risk preference is the choice an individual makes between risky choices (Levin & Hart, 2003). Risk perception is an individual's judgement of how risky a situation actually is, and is one of the most consistently used terms in the literature. The term risk bearing is used to describe situations where people are reluctant risk takers. They tolerate risk in order to live their lives, with risk taking being a means to achieve their sought-after ends, but without wishing to incur risk (Nicholson et al., 2005). Sensation seeking is the degree of sensation that individuals prefer to experience in their lives (Zuckerman, 1979). It is a construct related to risk taking and includes questions on thrill and experience seeking that are measuring aspects of RTB, but also boredom susceptibility and disinhibition, which are not.

Risk taking, risk propensity and risk behaviour are essentially measuring what risk individuals will actually take if they have the opportunity, and the terms risk taking and risk behaviour are both used in describing everyday risk taking (Blais & Weber, 2006a; Weber et al., 2002). The term "risk taking behaviour" (RTB) is preferred in the present research as this is a commonly used expression in the literature, and incorporates two commonly used expressions (risk taking and risk behaviour).

Other terms often used are risk seeking and risk averse. These are generally used to describe different ends of a continuum, to describe people who seek out risks, and those who actively avoid risk. The terms are particularly used in the literature based on gambling and probability scenarios. The term risk seeking is not so useful in the area of everyday risks, as these are situations where choosing one alternative over another is not necessarily risk seeking, but rather that the potential risk is not seen as one that is significant enough to warrant it being avoided, or it is not seen by the individual as being risky at all. An example is eating food past it 'best by' date, which many people do not consider a risk at all if they determine the food is still in an edible condition. The term risk-aversion is more useful, as excessively avoiding everyday risks identifies someone as being risk averse. Risk bearing is a useful term for describing everyday RTB, as it involves taking risks to achieve desired results, rather than seeking risks. In other

words, people who take a lot of risks in everyday risk situations may not be risk seeking, but instead risk bearing, but those who take few risks are likely to be risk averse.

2.1.1.1 What is everyday risk taking?

The construct of everyday risk was first used over 20 years ago in investigating the influence of depression on risk choices in everyday decision scenarios (Pietromonaco & Rook, 1987). Steketee & Frost (1994) developed the Everyday Risk Inventory (ERI), the only measure to use the name 'everyday risks', to determine whether people with obsessive compulsive disorder (OCD) are more risk-avoidant than other groups. They found existing measures of risk-taking, such as Zuckerman's (1979) Sensation Seeking Scale, measured the seeking of pleasure rather than the avoidance of danger or harm, the latter of which is thought to characterise people with obsessive compulsive disorder (Salkovskis, 1989). Similarly the Tridimensional Personality Questionnaire focuses more on novelty seeking, reward dependence and harm avoidant behaviour than on everyday risks (Cloninger, 1987).

The term everyday risk was first used in the context of measuring RTB in the *Everyday Risk Inventory (ERI)*, developed to measure everyday risk-taking that focussed on everyday activities that had some potential for harm, such as speeding on a motorway, or going out in cold weather without a coat (Steketee & Frost, 1994). Hockey, Maule, Clough, and Bdzola (2000) used the term in their study of the effects of negative mood states on decision making. They developed their own inventory, the *Personal Risk Inventory*, where participants were presented with a set of scenarios chosen to be representative of a wide range of situations frequently confronted by individuals in their normal life, such as parking where there is a risk your car could be clamped. These were developed from diaries people kept of frequently occurring decisions involving an element of risk. The other study to use a similar terminology was Tulloch and Lupton's (2003) study of risk and everyday life. They looked at the way people conceptualise risk, and how they perceive it affects them as part of their everyday life. They focussed on both the positive and negative aspects of risk, and how it impacts on people. The construct of everyday risk has had a relatively consistent definition across these studies, focusing on low level risks that involve situations that people frequently have to make decisions about, rather than gambling and sensation seeking which people can completely avoid.

An important difference between everyday RTB and risk in areas such as gambling and sensation seeking behaviours, is that being avoidant of everyday risks is likely to have a negative impact on the individual, people have to choose between two options that both have potential for negative consequences. An example is that avoiding social risk taking reduces the possibility of both positive and negative social interactions. With gambling and sensation seeking behaviour, it is a significant possibility that engaging in risk taking behaviours (RTB)

will have a serious negative impact on the individual, as these behaviours can lead to financial problems (gambling) and serious injury or death (sensation seeking), but being risk avoidant is unlikely to have negative consequences. Sensation seeking has also been linked to a range of behaviours with negative outcomes, most notably drug use and abuse (e.g. Kosten, Ball & Rounsaville, 1994; Teichman, Barnea & Ravav, 1989). Everyday RTB in contrast typically involves situations where the negative consequences are relatively minor, or extremely unlikely to occur, such as going outside in cold weather without a coat could cause a person to become unwell.

Reducing everyday RTB involves the avoidance of danger or harm, rather than the seeking of pleasure (Steketee & Frost, 1994). As the term implies, the scenarios involve decisions that individuals make every day about whether to perform a particular action or not. They are more relevant to the day to day lives of a majority of people than the gambling and environmental risk scenarios used in many risk research studies, as those situations may either not be considered by many people, or do not impact significantly on their lives. Studying everyday risks is also important as these situations are encountered regularly by people from a wide range of ages and cultures. An example is leaving belongings where they could possibly be stolen, a situation faced by people from a wide variety of ages and cultures.

2.1.2. Is RTB a Single Domain or Multiple Domain Construct?

Most of the early literature looking at RTB and risk perception was focussed on these constructs as involving a single domain. The main exception was studies of environmental risks, which did consider different categories of risks (Slovic, 1987). Some of the research on adolescent RTB also investigated multiple domains, such as sexual behaviour, driving, drinking, and drug taking (Siegel et al., 1994). Only since 2000 has there has been an increasing focus on the multidimensional nature of risk taking, and it has been shown that people's risk taking behaviour appears to be highly variable across domains and situations (Loewenstein et al., 2001).

Whilst there is domain specific RTB, there is also support for a general factor of risk taking (Blais & Weber, 2006a; Zuckerman, 2007), with research using multidomain tools showing highly significant correlations between subscales and the total score (Hunt, 2008; Weber et al., 2002). Most evidence suggests that there are some people who are consistent in their risk preferences, and this group tends to be risk averse (Soane & Chmiel, 2005; Weber et al., 2002). The combination of high correlations amongst domains of RTB, with only a small group who are consistent in their risk taking, indicates both a general factor of risk taking, and some level of domain specificity.

One researcher states there is no evidence for a general trait of everyday RTB (Rohrmann, 2002), but this research differed from other research in using risk situations where the risks were more explicitly stated, including what the benefits and risks were. For example when rock climbing the benefit is a sense of mastery, and the choice is stated as *be cautious*, or *take a risk*. Most other risk research lets the respondent determine the risks they view as present, rather than the researcher determining what these risks are. No other research has used a similar method, so the researcher determining what they perceive the benefits and risks that occur in the situation may have an influence on how a person responds to the scenario.

A number of reasons have been proposed to explain why people differ in their risk taking preferences across different situations. One reason is that situational factors are sometimes in conflict, and sometimes in concert, producing complex patterns of behaviour in which risk-seeking and risk-averse choices exist side-by-side in the same individual's behaviour (Lopes, 1986). This leads to a situation where people become reluctantly risk bearing, they take risks in order to live their lives, to achieve sought after ends without ever desiring to incur the risk (Nicholson et al., 2005). An example of this would be changing jobs, a situation in which the new job may be worse than the previous one, but also has the chance of ultimately leading to a better job and progressing the individual's career. People are also more likely to take risks where the benefits outweigh the potential negative consequences, and they may also perceive risks and returns differently for one domain than another (Weber et al., 2002).

Personality variables are associated with different RTB across domains, with people consistent in their risk preferences being low on neuroticism, and higher on agreeableness and conscientiousness (Soane & Chmiel, 2005). Although socially anxious individuals are generally risk averse, under specific conditions they may be risk-prone in particular activities such as heavy drinking, illicit drug use, unsafe sexual practices and aggression (Kashdan, Collins & Elhai, 2006), indicative of the specificity of RTB. Expected benefits and perceived risk also have an impact on the RTB in different domains. The expected benefits individuals felt could be gained from engaging in RTB led to the recreational risk taking increasing the most, and had the least affect on financial and social risks. Perceived risks reduced the likelihood of risk behaviour most for financial risks, and least for health and safety risks (Weber et al., 2002). Finally, people with OCD seem to be a group who would take some risks, but not others, such as taking physical risks but not emotional risks (Cicolini & Rees, 2003), and avoid situations where there is any chance they could be responsible for a negative outcome (Salkovskis, 1989). There is little agreement however on what the different domains of everyday risk taking are, with no consistency in the RTB measures used in previous research.

Horvath & Zuckerman (1993) looked at how people appraise risk in five different areas, crime, financial/gambling, minor rule/law violations, sports, and sexual risks. Bell, Schoenrock & O'Neal (2000), Gullone, Moore, Moss, & Boyd (2000) and Rosenbloom (2003) conducted similar studies, and used a variety of different domains of risk behaviour including substance use, safety, social risk, and health risks. All four of these studies used a format of measuring risk evaluation, where participants rated how risky they felt each situation was, followed by rating how many times they had engaged in the risk behaviour. Nicholson et al. (2005) separated risks into six different categories, recreational, health, career, financial, safety, and social risks. They asked people if they would take risks in each different area now, or have done so in the past, with a single question covering each domain. The *Domain Specific Risk Taking Scale (DOSPERT)* measures risks in five different content domains, financial decisions, health/safety, recreational, ethical and social decisions, with multiple items being used to assess RTB in each domain (Weber et al., 2002). The *Everyday Risk Inventory – Expanded (ERI-E)* uses a similar format to the DOSPERT and measures risks in six categories, risk to belongings, personal danger, health risks, unknown risks, social risks, risks to others (Hunt, 2008). Finally, Lupton & Tulloch (2002) conducted a qualitative study of risk and identified the dominant categories of risk as physical, health, financial, intimate, and foreign migration and travel.

There are a number of domains that are relatively consistent across different studies: physical (accidents); physical (illness); financial; and social; although they have not always been given these labels, with physical (illness) often being labelled health. Research supports the separation of physical risks into illness and accident categories (Rohrmann, 2002). Of the commonly used categories, financial risk taking is the category that has the lowest correlation with overall risk taking, and other risk taking domains (Weber et al., 2002). A particular problem is that this category often measures what people will do with excess income, a situation that does not occur for a majority of participants. A preferable risk category would involve loss of personal belongings, as this is a financial risk applicable to a vast majority of people, even though it does not measure the same type of financial risk, and may also include an additional component of losing items of personal rather than financial significance.

2.1.3. Existing Measures of RTB

A large numbers of measures of risk taking behaviour have been used since the original measures of 1964 (Kogan & Wallach, 1964; Zuckerman, Kolin, Price & Zoob, 1964). That the most widely used measure in the broad area of risk research is the Sensation Seeking Scale (SSS) (Zuckerman, 1979), even though only two of the four scales measure RTB (*Thrill and Adventure Seeking*, and *Experience Seeking*) is indicative of the problem. The other two scales (*Disinhibition* and *Boredom Susceptibility)* measure very different constructs. The SSS has a

correlation of only 0.58 with the Inventory of Risk Evaluation (a measure developed for the needs of the study), has low internal consistency for a number of the subscales (Ridgeway & Russell, 1980), with items also having high loadings on factors other than the ones they are scored on (Rowland & Franken, 1986). This is indicative of the lack of suitable instruments for research on RTB in general, and this research project in particular. A further problem is that a number of studies of risk taking were undertaken with adolescents, and included questions about behaviours such as drug taking, driving, and sexual behaviour. These cover some aspects of everyday risks relevant to adult populations, but others that are specifically relevant to adolescents.

In regards to the current research one of the key requirements is that the measure selected is able to be used to study risk taking across domains, and is applicable to an adult population. The only measures that meet these requirements are the Choice Dilemmas Questionnaire (CDQ) (Kogan & Wallach, 1964), the Risk Propensity Scale (RPS) (Nicholson et al., 2005), the DOSPERT scale (Weber et al., 2002), and the ERI-E (Hunt, 2008).

The CDQ has reliability problems, with internal consistency scores of .53 for men and .62 for women (Harrison, Young, Butow, Salkeld & Solomon, 2005). It uses language and scenarios that are suitable for college students and graduates rather than a general population sample, such as making lifetime career choices. The RPS (Nicholson et al., 2005) asks a single question about risk taking tendencies in each domain, so is not suitable for the current study, as it assumes a person is aware of how risk taking they are in a particular domain, and what each domain measures, an assumption that has no empirical support. For instance, two people may take the same risks in a domain, but only one consider themselves risk taking. On this basis the only inventories considered for further analysis are the DOSPERT and ERI-E.

The DOSPERT (Weber et al., 2002) was developed to measure risk taking in business managers, and a number of questions (particularly in the financial risk taking subscale) are more suitable to this group than the general population. Most of the items in the scale reflect everyday risk decisions, but a number are more related to sensation seeking, such as chasing a tornado. Further problems with this scale are the ethical risk category, which is specific to this measure, and which reflects the population the measure was devised for, with questions such as cheating in a university paper (Weber et al., 2002). Other problems with using the DOSPERT internationally is that two questions on the health and safety scale (wearing a seatbelt, and wearing a helmet on a motorbike) represent behaviours that are illegal in many countries, so are as likely to be measuring people's law abiding propensity as their health and safety concerns. A revision of this scale with items that were more specific to the United States has also been developed (Blais & Weber, 2006a). Maner & Schmidt (2006) found that when they used the

DOSPERT with a student population a number of items had to be omitted, either due to unsuitability for that sample, or unacceptably low item total correlations (less than 0.3). Analyses of the remaining items found subscales were not reliable and only a full scale score was able to be used. The DOSPERT therefore is most suitable for highly educated adult populations, those who have completed tertiary level study and are working in highly paid occupations.

The Everyday Risk Inventory (ERI) was originally developed to assess avoidance of potentially harmful ordinary activities (Steketee & Frost, 1994). Items were generated by asking student about activities that would represent mild risk-taking, that were not generally experienced as pleasurable. Examples were driving over the speed limit in a car, and drinking from a mountain stream. Psychometric properties of the scale were good, with internal consistency of 0.91, and a test-retest reliability of 0.93 over 14 to 21 days. It measures everyday risks as a single construct, and contains a number of items that are very similar, such as three items about driving in adverse weather conditions (sleet, snowstorm, and thunderstorm). It was revised into the ERI-E by the present author in 2008[1], with changes in two main areas. Firstly, a broader range of scenarios were developed, with removal of items that were very similar (e.g. separate items for driving in sleet, snowstorm, and thunderstorm), and new items developed in order to measure everyday risk taking in different content domains. Secondly, items were also developed, or altered, to be applicable to a wide range of respondents, both in terms of life stage and country the person lives in. For example, no items require participants to have attended tertiary level education, be pursuing a career, or have money to invest. Items were also reworded to eliminate words that may be unfamiliar to respondents in some countries (e.g. the word hiking was changed to walking).

In order to determine domains of everyday RTB, existing literature was analysed to determine suitable categories, and the original ERI was analysed to identify categories the items fitted into. Many items fitted into commonly used domains of social, recreational, and health risks, but item analysis of remaining items identified similarities amongst them that suggested additional categories of risk. A number of items involved potential loss of valuable belongings which has similarities to financial risk taking, as it involves the risk of losing valuable property. This category was labelled as *risks to belongings*. Other items involved situations where the exact nature of the risk was uncertain, such as moving to a new city. In this situation the risks could be of almost any type, which is what characterises these items, and this category was termed *unknown risks*. This category has similarities to people being intolerant of uncertainty, a construct that has strong correlations with scores on measures of anxiety and depression

[1] The ERI-E version from the 2008 research is the first 58 items of the version included in Appendix A.

(Freeston, Rhéaume, Letarte, Dugas & Ladouceur, 1994). Other items involved situations where the risk was not to the individual directly, but where their actions could place others at risk, and this category was labelled *risks to others.* The ERI was originally devised for people with OCD, and risk averse behaviour in this domain may reflect the inflated belief in the probability of being the cause of harm to others, something which is common in OCD (Salkovskis, 1989). The ERI-E requires further development as the internal consistency of some of the subscales is substantially below 0.7. This may be due to the low number of items in these subscales, which is known to reduce Cronbach's Alpha (Cortina, 1993). For instance, the social risks scale, with only four items and an internal consistency of 0.43, indicates that additional items are required in order for the scale to be reliable. The ERI-E showed evidence of construct validity with higher correlations with scales of the SSS that measure RTB than those that do not, with the highest correlation being between the most similar subscales, *Thrill and Adventure Seeking* from the SSS and *Risks Involving Personal Danger* from the ERI-E.

Due to there being no measure that is entirely suitable for the present study, the development of the ERI-E into a suitable measure is considered the best option, with the addition of items for some domains likely to improve the problems with internal consistency. Using the DOSPERT would require the removal or significant alteration of three of the five scales (financial, social, and ethical risk taking), and changes to at least two items in each of other scales. This would mean that more than half of the measure would need to be changed, resulting in the initial scale requiring more alteration than is required to develop the ERI-E into a suitable measure for this research.

The ERI-E has also been tested for reliability and validity on a population more similar to that which will be used in this research, and particular attention was paid to ensuring the questions suited a wide group of respondents. The revisions to the ERI-E suggested by Hunt (2008) have been made, with the elimination of two items and the rewording of one other. As well as this additional items have been devised, including some added from other measures of everyday risk taking, in order to have a consistent and adequate number of items in each subscale. These changes will be tested using confirmatory factor analysis (CFA), to determine if the items improve the fit of the model. This confirmatory approach is being used, as the items have been developed to fit into predetermined categories. The ideal number of items per factor was determined to be six, as this provides a balance between the measure being brief, but still containing reliable factors.

To test the primary hypothesis of a link between levels of anxiety, depression and everyday RTB, a suitable way of measuring anxiety and depression had to be determined. The use of a measure was the method chosen, as this enabled assessment of the individual via distribution of research materials, without the need for face to face contact.

2.1.4. Measures of Anxiety and Depression

In selecting a measure for anxiety and depression a number of considerations had to be met. The method of questionnaire distribution, including use of the internet, meant the measure had to be freely available (not covered by copyright). It had to have good psychometric properties, ideally well researched, and used with a range of different populations, making it suitable for internet based research. A further consideration was the length of the questionnaire. A brief scale was desirable as the length of questionnaires has been shown to influence response rates in both web-based (Shih, 2008) and postal (Edwards et al., 2002) surveys. The Depression, Stress and Anxiety Scale (DASS) was the only measure that adequately met these requirements. However, it was developed in Australia, and the suitability for use with a New Zealand population has not been established. Psychometric testing on a New Zealand community sample will be conducted in this part of the research to determine its suitability, before it is used to assess relationships between anxiety, depression and everyday RTB. The fit of the factor structure and the internal consistency of the scales will be assessed. Further details of psychometric properties of the DASS are outlined in Section 2.2.2.2.

2.1.5. Research Objectives

The main research objective for this section is the development of a measure of everyday RTB that is valid and reliable, and determining whether everyday RTB is a single or multiple domain construct. The ERI-E is the measure which will be further developed. The second research objective is determining the suitability of the DASS for this research.

2.2. Methods

2.2.1 Samples and Procedure

Questionnaires were distributed to three different groups of participants. The first two groups were New Zealand based (university student and general community samples). The third group was an international sample, collected via the internet. The handout given to participants is shown in Appendix A. All participants completed the ERI-E, the Depression, Anxiety and Stress Scale (DASS-21), and a demographic information sheet. The questionnaires were the same for each sample with the exception of demographic questions that were changed or altered on the internet version to take account of people from different countries completing the measure. The question concerning income was removed due to difficulties comparing income internationally, including have to calculate exchange rates. The question regarding ethnicity was replaced by one for nationality, as the location of participants was of interest, in order to compare everyday RTB between countries. The size of the place people live was also changed

to take account of the larger cities that exist outside of New Zealand, an extra option of over 1,000,000 people was added.

2.2.1.1 New Zealand tertiary student sample.

503 questionnaires were distributed to undergraduate university students from five different subject areas, at two different Massey University campuses (Wellington and Palmerston North). A brief outline of the research was given at the conclusion of lectures, and students collected questionnaires as they left in order to complete them elsewhere. The questionnaires took approximately 15 minutes to complete. A total of 200 questionnaires (143 female, 57 male) were returned (a response rate of 40%), from students ranging in age from 17-64 (M = 21.8; SD = 8.78). Of the respondents 79% were NZ European/Pakeha, 8% Maori, and 13% other ethnicities. 67% were single, and 94% did not have dependent children. The high percentage of female respondents was largely due to the distribution in lectures with predominantly female students (e.g. Nursing and Psychology).

2.2.1.2 New Zealand community sample.

The second sample was undertaken by posting out the same questionnaires as used in the student sample to 1000 people randomly selected from the electoral roll. A total of 308 questionnaires (180 female, 127 male, 1 not stated) were completed and returned (a response rate of 31%), from people ranging in age from 18-88 years (M= 47.9; SD = 16.7). 85% of the respondents were NZ European/Pakeha, 6% Maori, and 9% other ethnicities. 48% had a university/polytechnic qualification, and 34% had dependent children. 58% were married, and 49% were employed full time. 49% lived in cities of more than 100,000 people, and there was an approximately even split in the income bands given, representing an approximate median income of $40,000. The sample was unrepresentative of the general population in two identifiable areas, a 10% higher proportion of NZ European/ Pakeha, and median income of approximately 50% higher than normal (Statistics New Zealand, 2006). Due to these differences the sample is not considered random, but does contain a wider range of respondents than the other two samples.

2.2.1.3. International internet sample.

The third sample was conducted via the internet, promoted via four websites, two for internet based scientific research, and two discussion forums (for anxiety and depression). 141 people completed the questionnaires (108 female, 30 male, 3 not stated), which took approximately ten minutes to complete. The respondents were from thirteen different countries, with the majority (75%) from the United States, and other countries with more than one respondent were Australia, Canada, Poland, and Great Britain. The respondents ranged in age from 16-61 years (M = 27; SD = 9.6). 30% with a university/polytechnic qualification, 20% with dependent

children, 23% married, 43% students, and 32% lived in urban areas of between 20,000 and 100,000 people, with an even spread amongst other sized locations. This sample would best be described as composed of approximately one third United States students, and the rest a more general population sample, approximately half of which were from the United States.

2.2.2. Measures

2.2.2.1 Everyday Risk Inventory -Expanded (ERI-E).

The Everyday Risk Inventory - Expanded (ERI-E) is a multidimensional measure of risk taking in six domains, as well as an overall measure of everyday risk taking. Items are rated on a likert scale from 1 (I would never do this) to 5 (I would definitely do this). It was developed by the current author from the original Everyday Risk Inventory of Steketee and Frost (1994). The ERI-E was a substantial alteration of this measure, developing it into a multiple domain measure, removing items that were very similar, and extending the number of items, particularly to develop sufficient items for each domain.

The six domains of the ERI-E are:

Risk to belongings: questions cover the degree to which people were prepared to risk personal belongings, such as their house or car, by lending them to other people, or not locking them.

Risks involving personal danger involve taking risks that could result in injury. These include speeding in a car, allowing a stranger to come into your house, and flying in a small plane. This is a risk category that has been often used in past research.

Health risks are also related to risk to self, but specifically to becoming physically unwell, rather than suffering an injury. These items include sharing drink bottles, and using public toilets. This is a commonly used risk category in previous research.

Unknown risks are taking risks where the outcome is largely unknown, and both the type and degree of risk are very hard to determine. Examples are going on holiday without a specific itinerary, and driving somewhere without directions. This risk category has not been used in past research.

Social risks are risks where the outcome could cause social embarrassment, such as going to a party or bar by yourself, or making a recipe for guests that you haven't made before.

Risks to others are situations where the danger is to someone other than the respondent. Examples were letting a child walk home alone, and leaving a drunken best friend at a bar.

The original research with the ERI-E showed expected correlations with subscales of the SSS, giving good evidence of construct validity of both the full scale, and subscales. There was a problem with the internal consistency of some of the subscales however, particularly with risks to other, social risks, and health risks (below 0.5 for social risks) (Hunt, 2008). Sixteen extra questions were added for the current research (items 59-74 in Appendix A) to try and improve the internal consistency, as the low number of items in these scales was most likely a contributory reason for the low values. The extra items were developed for those scales with internal consistency problems. These were developed by a variety of means. A number were taken from existing RTB questionnaires, such as the DOSPERT and SSS, and also from asking other people what types of risks they thought were relevant in each domain. Three questions (regarding smoke alarms, supplying alcohol to minors, and eating unhealthy food) were derived from reports of these issues in the media. Finally, one question (public speaking) was added due to its association with social anxiety, and therefore being a good item for measuring social RTB. CFA using structural equation modelling (SEM) will be used to determine whether the proposed factor structure is a good fit for the data.

2.2.2.2 Depression, Anxiety and Stress Scale (DASS-21).

This scale was developed by Lovibond and Lovibond in 1993, with both 42 and 21 item versions. The DASS measures anxiety, depression and stress, as well as an overall scale measuring general psychological distress. There are equal numbers of items in each subscale, each rated on a 4 point likert scale of how much the item applied to them over the past week, with high scores indicating higher levels of psychological distress. Both versions show good psychometric properties, with adequate reliability across a number of samples, correlations with other measures of anxiety and depression as expected, and the factor structure has been replicated in different samples (Lovibond & Lovibond, 1995). The DASS has higher correlations with the trait measure than the state measure of the State Trait Anxiety Inventory (Fydrich, Dowdall & Chambless, 1992), and is scored over the same time frame as the BAI (a measure of trait anxiety) (Beck & Steer, 1990), and is therefore considered a measure of trait rather than state anxiety, depression, and stress.

The DASS-21 has several advantages, with fewer items, a better factor structure (no items loading highly onto more than one subscale), and smaller inter-factor correlations (Antony, Bieling, Cox, Enns & Swinson, 1998), meaning it is more suitable for this research than the 42 item version. It has also proven to be useful cross-culturally with adequate reliability and validity in populations as diverse as Turkish (DASS) (Akin & Cetin, 2007) and Iranian (DASS-21) (Sahebi, Ashgari & Salari, 2004). The psychometric analysis on four racial groups in the United States indicated the measure is suitable for a range of racial groups (Asian, African American, Caucasian and Hispanic samples were included). The internal consistency and

convergent and discriminant validity were similar across racial groups, and the items loaded onto the scales in a similar way, but the constructs may be differentially inter-related across racial groups as factor intercorrelations varied between groups (Norton, 2007). In a non-clinical sample the DASS was also shown to be reliable and valid (Crawford & Henry, 2003), although there is some questions about the specificity of the stress scale, which has been shown to be more of a measure of general psychological distress (GSD) (Henry & Crawford, 2005).

2.2.3. Statistical Analysis

Data was analysed using SPSS for Windows (Version 19). Analysis of Moment Structures (AMOS, Version 19) was used for confirmatory factor analysis (CFA), a program that calculates fit indices using a covariance matrix. Goodness of fit criteria was analysed using several criteria, the root-mean-square error of approximation (RMSEA), the Tucker-Lewis Index (TLI), and the comparative fit index (CFI), as these each measure slightly different aspects of model fit. The estimation method used was maximum likelihood estimation.

The RMSEA estimates how well the model may hold in a population if the covariance matrix of the population was available. It approximates a non-central chi-square distribution and is a parsimony-adjusted measure index. This means that its formula includes a built in measure for model complexity, meaning given similar overall explanatory power for the same data the simpler model will be favoured (Kline, 2011). It corrects for the tendency of the χ^2 to reject models with large sample data. An RMSEA of <.05 is considered a close fit, .05 - .08 indicates a reasonable fit, between .08 and .10 indicates a mediocre fit, and > .10 indicates a poor fit (Hu & Bentler, 1999).

Both the CFI and TLI (also known as the Bentler-Bonett non-normed index –NNFI) are indicators of model fit derived from a comparison between the hypothesised model and a null model in which all observed variables are uncorrelated. They are both less biased by small sample size than other fit indices (Kline, 2011). The TLI provides a measure of parsimony between the estimated and null models. The CFI is a rescaled version of the Relative Noncentrality Index with values that fall between 0 and 1 (Kline, 2011). It is recommended as the index of choice for CFA, with values above 0.9 (for both the CFI and TLI) indicating a good fit (Hu & Bentler, 1999).

2.3. Results

The two parts of the results section are the factor analysis of the two measures used, the ERI-E and the DASS-21. Each section will follow the structure of determining the suitability of the data for use in factor analysis, followed by the factor analysis itself, and calculation of other important statistical information for determining whether the final factor structure is suitable, predominantly calculation of internal consistency of the subscales determined by the factor analysis procedures, and subscale correlations. Different models will be tested for each of the measures, which will be discussed in the relevant section.

2.3.1. Everyday Risk Inventory – Expanded (ERI-E)

2.3.1.1. Comparison of samples.

As there are significant differences between the samples, Table 1 presents the descriptive statistics for the three groups. There are major differences between the samples, with the internet sample being more similar to the student sample than to the community sample. These differences occur on all of the variables analysed, with the most significant differences being for age. For this reason samples will not be combined, and all analyses will begin with the community sample as this is the largest, meaning it has more power to detect significant differences.

Table 1
Descriptive statistics and comparisons between samples

	Community	Internet	Student	*F*	*p*
N	308	141	200		
Age *(M(SD))*	47.9 (16.70)	27.1 (9.64)	21.83 (8.78)	267	.000[a]
Gender (% female)	54%	78%	72%	16.3	.000[b]
Qualification (% with tertiary level qualification	48%	30%	18%	27.7	.000[a]
Children (% having children	34%	20%	6%	31.0	.000[a]

[a] – all three samples significantly different.
[b] – student and internet samples significantly different to community sample.

2.3.1.2. Initial data analysis.

Missing data.

The presence of incomplete data for the sample was minimal. There was a missing data rate of approximately 0.2% across all respondents, approximately one missing response for every five respondents. Where respondents did not respond to more than 5% of items for a questionnaire they were excluded from further analysis (a total of 2 respondents). A number of respondents did not respond to some of the items, with few respondents missing more than two items. A number of options for dealing with missing data were considered. As the percentage of missing data was so low, single imputation was a better option than case deletion, and replacing missing data with the mean for that particular item has a minimal effect on estimates (Schafer & Graham, 2002), meaning more complicated methods of replacing missing data is not necessary.

Outliers.

There were no univariate outliers detected, with all items scoring the full range of responses. Further testing for bivariate and multivariate outliers was undertaken following the CFA procedures, and is discussed in Chapter 3.

Normality assumptions.

Individual item analysis was undertaken prior to the CFA, in order to identify items that did not meet the normal distribution requirements for CFA. The values are presented in Appendix B for each of the samples. The criteria for eliminating items due to high levels of non-normality are a skewness value greater than 2 and kurtosis value greater than 7 (West, Finch & Curran, 1995). As no items exceeded the cutoff for kurtosis, and the highest skewness value was only just above the cutoff limit (no item exceeded this value for all samples), all items were left in for the initial CFA analysis. One item (Item 59) was removed due to a negative item-total correlation. Reverse scoring of this item was not considered, as the absolute value of the correlation was very low. The item asked about whether people would go to the doctor if they had a problem that would not go away, and given the item total correlation is significantly lower than for all other items, appears to be measuring something other than people's risk taking behaviour.

Item correlations.

Correlations between the items were analysed, as high correlations means that the items are likely to be measuring the same behaviour, rather than different behaviours. It also means that the denominators for certain mathematical operations within the CFA will cause unstable solutions (Byrne, 2001). The average correlation between items was 0.19, with less than 0.1% of correlations above 0.5, and only one correlation being above 0.6 (0.648 between items 34 and

58). These items are measuring aspects of people's view of drunk driving, with the difference being that item 34 asks about the respondent driving, and item 58 about a friend driving. It was decided to leave both items in for the initial CFA analysis, and use the statistical process of CFA analysis to determine the suitability of the items. The initial CFA was therefore undertaken with 73 items, after the removal of item 59.

2.3.1.3. Confirmatory factor analysis.

Given the number of participants in each group only the community sample has the required number of participants to conduct a CFA analysis. The minimum requirement is three items per factor (Kline, 2011), and the internet and student samples do not meet this requirement. Therefore these samples will only be used to confirm the suitability of the models developed (using the community sample), and the results will be interpreted in the context of the low number of participants leading to poor psychometric properties for some fit indices. Multi-sample CFA models are therefore not used in this analysis, due to the unsuitability of the internet and student samples.

Models tested.

In previous research, a CFA of the ERI-E showed there was little difference in the fit statistics between a single factor model and a six-factor model with a second order factor of everyday risk taking, both being a moderate to good fit for the data (Hunt, 2008). This is consistent with research that shows that there is both a general factor of everyday RTB, but also some domain specific RTB (Blais & Weber, 2006a; Zuckerman, 2007). Therefore the fit of both these models were again tested with the new version of the ERI-E, incorporating the additional items. Testing of the second model will be a two-step process, first testing a six factor correlated model, and then the second order model. This is to enable testing of the suitability of the factor structure, and factor correlations before testing the second order model.

These were the only models tested for two reasons. Firstly, with CFA there is a danger of overfitting models to the data if a large number of all possible models are tested, and so models tested should be restricted to those theoretically justified (Kline, 2011). Secondly, reducing the factors to a smaller number is problematic (e.g. collapsing the six factors into 3 factors), as the existing factors are conceptually distinct and therefore there is no theoretical justification for combining them.

Model 1 – Single factor model.

Initial CFA results.

An initial CFA was run using the 73 items, with all items loading onto a single factor. The results showed that the fit was poor (χ^2 = 8937, *df* = 2555, RMSEA = 0.062, TLI = 0.56, CFI = 0.57), with all indices showing a moderate to poor fit.

CFA after removal of items with low loading.

Items were successively removed until all factor loadings were above 0.3, an approach commonly used for CFA analysis to maximise scale reliability (Raubenheimer, 2007). Factor loadings measure the degree to which each item correlates with the factor it is expected to load onto. This resulted in the removal of four items. An analysis was run on the individual samples in order to have only those items which loaded above 0.3 for all samples. This resulted in the removal of a further 16 items, with the overall fit for the remaining 53 items being poor (χ^2 = 4939, *df* = 1325, RMSEA = 0.065, TLI = 0.65, CFI = 0.66). Further reduction of items was completed, based on removing items with lower loadings, so only the best 36 items remained, a number determined by the aim of having the same number of items in both the single factor and six factor models in order to make differences between the fits of the models not be influenced by the number of items each model contains. Modification indices were analysed to determine whether items with high correlations between error terms were due to a shared similarity between the items, unrelated to their relationship with everyday risk taking.

One pair of items was identified, and correlated errors between these items were added to produce the final model. The pair was items 45 (Change jobs to one that was more exciting but also unpredictable) and 48 (Quit a job without another one to go to), which measure different aspects of leaving your employment. The overall fit for this model was moderate to good (χ^2 = 1846, *df* = 594, RMSEA = 0.057, TLI = 0.79, CFI = 0.81). Analyses were run for the individual samples, and the results are presented in Table 2. The community sample had the best fit, and the internet sample the worst fit, but the numbers for the internet sample were lower than is ideal for a CFA (141 participants) (Kline, 2011), which may account for the difference in the fit statistics. The RMSEA values for all samples indicate a good fit, but the TLI and CFA values indicate a moderate to poor fit for all of the samples.

The loadings for each sample for the one-factor model are shown in Table 3, and the final model is shown in Figure 1. The item loadings were best for the community sample, with all

Table 2
Final CFA results for single factor model

	Student *n* =200	Internet *n* = 141	Community *n* =308
χ^2	885	942	1088
df	593	593	593
χ^2/df	1.49	1.59	1.84
TLI	0.77	0.71	0.85
CFI	0.78	0.73	0.85
RMSEA	0.050	0.065	0.052

standardised weights exceeding 0.4, and the lowest loadings were for the student sample where some standardised weights just exceeded the minimum acceptable value of 0.3. The internal consistency of the single factor was excellent, with values ranging from 0.93 for the community sample, 0.91 for the internet sample, and 0.90 for the student sample.

Model 2 – Six factor model.

The first step of this process was testing a model with six correlated factors to assess the factor structure, cross-loadings, and factor correlations. The second step is to determine the suitability of the model with a second order factor of everyday RTB.

Initial CFA results.

An initial CFA was run using the same 73 items as in the single factor analysis, and based on the proposed six-factor model, with correlated factors, as shown in Appendix C. The results showed that the fit was poor (χ^2 = 5173, *df* = 1755, RMSEA = 0.080, TLI = 0.55, CFI = 0.57), with all indices showing a moderate to poor fit, with similar values to the single factor model.

CFA after removal of items with low loading.

Initial data analysis was conducted on the community sample. Items were successively removed until all item loadings for their relevant subscale were above 0.3, the same process as for the single factor analysis. This resulted in the minimum number of items on each subscale being seven. As the optimal number of items per scale was determined to be six items (see end of Section 2.1.3 for rationale), other items were removed to improve the fit of the model. Items were initially removed that had large modification indices, representing significant correlations of error variance between items, in most cases on different subscales. Once this step had been completed any scales with more than six items remaining had the items with the lowest factor

Table 3
Item loadings for single factor CFA solution

	Community		Internet		Student	
	Standardised regression weight	Regression weight	Standardised regression weight	Regression weight	Standardised regression weight	Regression weight
ERI1	0.531	1.001	0.43	0.96	0.365	0.706
ERI2	0.474	0.800	0.348	0.674	0.395	0.586
ERI5	0.477	0.665	0.364	0.565	0.407	0.680
ERI6	0.619	1.226	0.373	0.785	0.450	0.897
ERI8	0.507	1.065	0.449	1.102	0.326	0.695
ERI9	0.694	1.375	0.551	1.063	0.571	1.010
ERI11	0.655	1.240	0.65	1.428	0.477	0.944
ERI12	0.545	1.048	0.543	1.148	0.565	1.132
ERI13	0.591	0.984	0.445	0.971	0.415	0.817
ERI14	0.617	1.097	0.446	0.852	0.569	1.028
ERI15	0.472	0.794	0.389	0.685	0.349	0.573
ERI16	0.535	0.884	0.356	0.726	0.466	0.805
ERI18	0.591	1.129	0.559	1.161	0.457	0.798
ERI19	0.613	0.912	0.505	0.772	0.520	0.900
ERI20	0.539	0.825	0.476	0.964	0.341	0.558
ERI21	0.517	0.716	0.493	0.939	0.332	0.492
ERI22	0.557	0.790	0.475	0.839	0.462	0.741
ERI23	0.614	1.013	0.467	0.863	0.529	0.959
ERI24	0.438	0.871	0.456	1.003	0.435	0.919
ERI25	0.519	1.073	0.466	1.102	0.309	0.709
ERI26	0.609	1.182	0.446	0.975	0.458	0.904
ERI30	0.527	0.972	0.399	0.861	0.432	0.826
ERI38	0.483	0.685	0.339	0.586	0.407	0.588
ERI39	0.600	1.081	0.702	1.464	0.402	0.722
ERI45	0.466	0.733	0.574	1.153	0.491	0.755
ERI46	0.536	0.871	0.515	1.075	0.431	0.698
ERI48	0.407	0.719	0.408	0.924	0.314	0.510
ERI49	0.487	0.890	0.458	1.018	0.357	0.587
ERI52	0.413	0.714	0.561	1.207	0.441	0.741
ERI55	0.538	0.833	0.369	0.65	0.422	0.645
ERI57	0.549	1	0.443	1	0.530	1
ERI61	0.436	0.754	0.464	0.921	0.412	0.797
ERI64	0.536	0.927	0.572	1.047	0.452	0.825
ERI65	0.484	0.739	0.503	1.07	0.384	0.710
ERI71	0.438	0.571	0.432	0.799	0.398	0.781
ERI73	0.465	0.663	0.311	0.511	0.342	0.531
Average	0.529	0.912	0.464	0.940	0.428	0.765

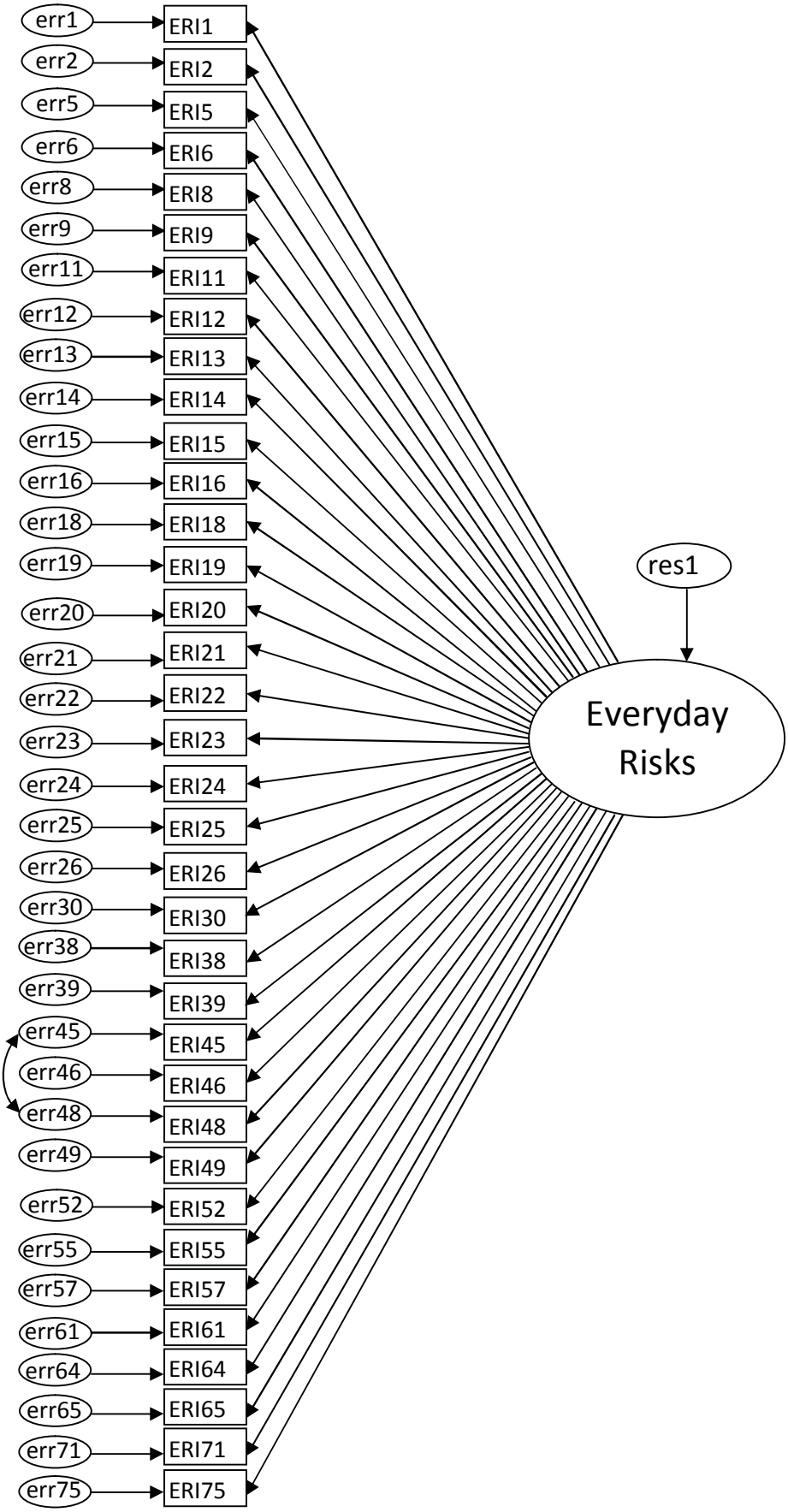

Figure 1: One factor CFA model – final.

loadings removed. As a final step modification indices were analysed to determine whether items with high correlations between error terms were due to a shared similarity between the items, unrelated to their relationship with everyday risk taking.

Two pairs of items were identified, and correlated errors between these items were added to produce the final model. The first pair was items 35 (Move to a city where you don't know many people) and 45 (Change jobs to one that was more exciting but also unpredictable), which measure different aspects of leaving your employment. The second pair was items 38 (Disagree with a friend, knowing it could lead to an argument) and 43 (Tell a friend the truth, even though it might upset them), both of which involve aspects of upsetting a friend. The overall fit for the 36 item model for the community sample was moderate to good ($\chi 2 = 1046$, $df = 586$, RMSEA = 0.051, TLI = 0.85, CFI = 0.86), with very similar values to the single factor model. The fit was best for the community sample, and worst for the internet sample (which had a low number of participants), and these results are shown in Table 4. The RMSEA values for all samples indicate a good fit, but the TLI and CFA values indicate a moderate to poor fit for all of the samples.

The correlations between the factors are shown in Table 5, and loadings for each sample for the six-factor model with correlated factors are shown in Table 7. These results show that all items load adequately onto the appropriate factors, with the highest loadings being for the community sample, and lowest for the student sample. All correlations between factors exceed 0.5 (only one is below 0.6), and the highest is 0.87. This indicates that each item does correlate well with the factor it was expected to load onto, and that the factors are measuring different, but related, constructs. This supports the suitability of the six-factor structure, and therefore it is justified to proceed to the next stage of the analysis, testing the model with a second order factor of overall everyday RTB.

Table 4
CFA fit indices for Model 2 – correlated factors

	Student	Internet	Community
χ^2	895	900	1024
df	577	577	577
χ^2/df	1.55	1.56	1.77
TLI	0.74	0.74	0.85
CFI	0.76	0.76	0.87
RMSEA	0.053	0.063	0.050

Table 5
Correlations between ERI-E factors (community sample)

	Unknown risks	Risks to others	Risks to belongings	Social risks	Health risks
Risks involving personal danger	0.811	0.838	0.817	0.786	0.870
Unknown risks		0.600	0.764	0.825	0.780
Risks to others			0.697	0.583	0.691
Risks to belongings				0.678	0.807
Social risks					0.748

Second stage of CFA procedures for model 2.

Given the suitability of the six-factor structure (in terms of cross-loadings and factor correlations), progressing to the second stage of the CFA, with a second order factor of everyday risk taking, was undertaken. The results in Table 6 indicate this model has a moderate to good fit to the data. The final model is shown in Figure 2, with the items for each factor (and their loadings) shown in Table 8. The RMSEA values for all samples indicate a good fit, but the TLI and CFA values indicate a moderate to poor fit for all of the samples. In regards to item loadings, these are all between 0.47 and 0.70, indicating all items load adequately onto their respective domains.

Internal consistency of the subscales.

The internal consistencies of the subscales for model 2 are shown in Table 9. The ERI-E has good internal consistency for the community sample. For the internet sample only the health subscale has a low internal consistency, but almost all of the subscales for the student sample have moderate to poor internal consistency. The lowest values being 0.59 for health risks and risks to belongings.

Table 6
CFA fit indices for Model 2 – second order factor

	Student	Internet	Community
χ^2	912	929	1046
df	586	586	586
χ^2/df	1.56	1.59	1.79
TLI	0.74	0.73	0.85
CFI	0.75	0.75	0.86
RMSEA	0.053	0.065	0.051

Table 7
Factor loadings for six factor solution

		Student		Internet		Community	
		Standardised	Unstandardised	Standardised	Unstandardised	Standardised	Unstandardised
ERI5	Health risks	0.46	0.80	0.39	0.61	0.53	0.57
ERI6	Health risks	0.48	1	0.47	1	0.65	1
ERI8	Health risks	0.36	0.81	0.53	1.3	0.54	0.88
ERI11	Health risks	0.40	0.87	0.68	1.51	0.66	0.96
ERI16	Health risks	0.49	0.88	0.36	0.73	0.55	0.71
ERI57	Health risks	0.52	1.04	0.48	1.07	0.57	0.81
ERI38	Social risks	0.52	1.17	0.48	1.30	0.61	1.03
ERI43	Social risks	0.43	1.04	0.39	1	0.53	1.09
ERI63	Social risks	0.33	1	0.52	1.69	0.47	1
ERI64	Social risks	0.56	0.62	0.62	1.79	0.59	0.57
ERI65	Social risks	0.57	1.03	0.62	2.07	0.58	1.12
ERI66	Social risks	0.39	1.14	0.52	1.28	0.47	0.77
ERI9	Risks involving personal danger	0.67	1.26	0.6	0.91	0.7	1.14
ERI12	Risks involving personal danger	0.58	1	0.6	1	0.56	1
ERI13	Risks involving personal danger	0.43	0.89	0.51	0.87	0.64	1.07
ERI19	Risks involving personal danger	0.55	1.84	0.51	0.61	0.63	1.36
ERI20	Risks involving personal danger	0.35	1.83	0.52	0.82	0.56	1.18
ERI23	Risks involving personal danger	0.62	0.85	0.48	0.70	0.67	0.9
ERI2	Unknown risks	0.45	1.00	0.39	0.69	0.57	1.30
ERI4	Unknown risks	0.45	1	0.51	1	0.56	1
ERI26	Unknown risks	0.47	0.75	0.49	0.99	0.63	0.99

Table 7 continued

ERI30	Unknown risks	0.54	0.79	0.53	1.06	0.63	0.88
ERI35	Unknown risks	0.43	0.48	0.57	1.12	0.54	0.80
ERI45	Unknown risks	0.55	0.95	0.66	1.22	0.54	1.04
ERI1	Risks to Belongings	0.49	0.80	0.48	0.75	0.62	0.89
ERI25	Risks to Belongings	0.37	1	0.55	0.90	0.59	1
ERI39	Risks to Belongings	0.44	1.04	0.69	1	0.62	1.38
ERI50	Risks to Belongings	0.43	1.17	0.42	0.41	0.51	1.14
ERI51	Risks to Belongings	0.43	0.77	0.56	0.93	0.61	1.08
ERI52	Risks to Belongings	0.52	0.96	0.65	0.98	0.50	0.92
ERI21	Risks to Others	0.56	1.07	0.79	2.25	0.60	0.78
ERI36	Risks to Others	0.55	1	0.51	1	0.51	1
ERI41	Risks to Others	0.50	0.87	0.63	1.60	0.61	1.25
ERI56	Risks to Others	0.54	0.87	0.74	1.67	0.52	1.17
ERI72	Risks to Others	0.48	0.80	0.51	0.97	0.49	0.82
ERI73	Risks to Others	0.36	0.68	0.42	1.04	0.51	1.20
Average		0.53	0.97	0.58	1.08	0.62	0.99

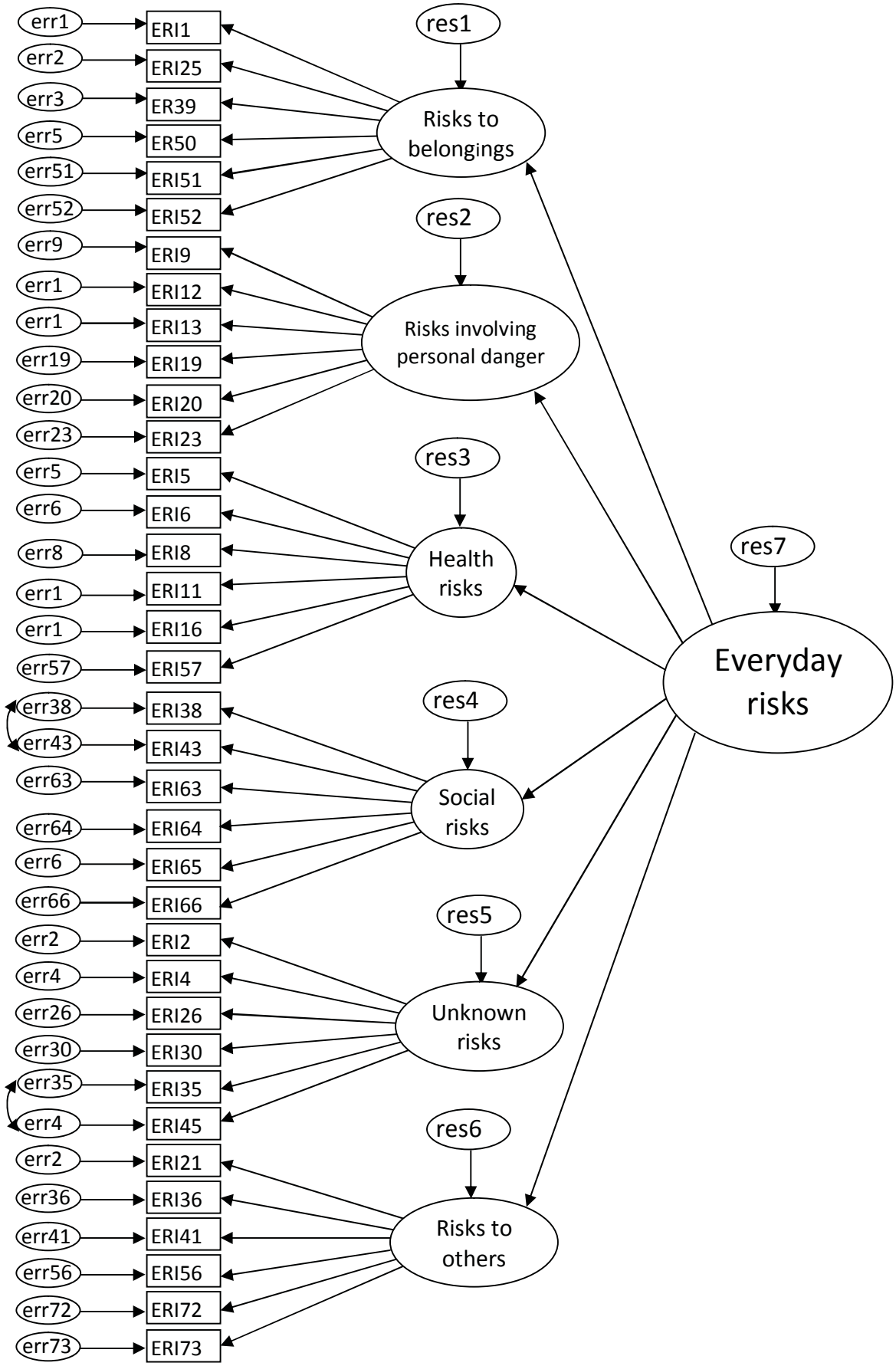

Figure 2. Model 2 – with second order factor.

Table 8

Everyday Risk Inventory – Expanded domain items with loadings (for community sample)

Domain		Loadings
Risk to belongings	Leave your car unlocked while going into a shop for a few minutes.	0.62
	Leave your house unlocked when you're home during the day.	0.59
	Leave your washing on the line shared with other houses/flats.	0.62
	Lend your favourite book or CD to a friend.	0.51
	Leave an unlocked bicycle outside your house.	0.61
	Leave your jacket unattended in a bar.	0.50
Unknown risks	See a movie without knowing much about it.	0.57
	Go on a holiday without a specific itinerary.	0.56
	Order a dish in a foreign restaurant when you don't know the ingredients.	0.63
		0.63
	Drive somewhere without directions.	0.54
	Move to a city where you don’t know many people.	0.54
	Change jobs to one that was more exciting but also unpredictable.	
Risks involving personal danger	Go walking in a national park out of mobile phone coverage	0.70
	Go out into the open ocean in a small boat.	0.56
	Pat an unfamiliar large dog in the park whose owner is not in sight.	0.64
	Allow a stranger to come into your home to use your phone.	0.63
	Drive in heavy rain to do an errand you could postpone.	0.56
	Take a shortcut down a dark path at night.	0.67
Risks to others	Let a friend leave a bar to go home with someone she has just met.	0.60
	Leave a small child home alone while going out for a few minutes.	0.51
	Let a female friend walk home alone at night.	0.61
	Leave your drunk best friend at a bar.	0.52
	Take a young child in a car without a proper child seat.	0.49
	Leave a child with a babysitter recommended to you, but who you don’t know personally.	0.51
Social risks	Disagree with a friend, knowing it could lead to an argument.	0.61
	Tell a friend the truth, even though it might upset them.	0.53
	Go on a date with a work colleague	0.47
	Go flatting/boarding with people you don’t know very well.	0.59
	Admit that your tastes are different to those of your friends.	0.47
	Wear clothes that may not be appropriate for the occasion (makes you stand out).	0.58
Health risks	Eat meat that did not seem to be properly cooked.	0.53
	Drink from a water fountain in a public place.	0.65
	Sit directly on a public toilet seat	0.54
	Drink from a bottle used by a friend.	0.66
	Go out without a coat in cold weather.	0.55
	Eat food that is just past its use by date.	0.57

Table 9
Internal consistencies for six factor solution

	Student	Internet	Community
Risks to belongings	0.59	0.73	0.75
Unknown risks	0.64	0.69	0.75
Risks involving personal danger	0.70	0.71	0.79
Risks to others	0.65	0.77	0.71
Social risks	0.63	0.70	0.71
Health risks	0.59	0.65	0.75
Everyday risks	0.82	0.83	0.88

Descriptive statistics.

The descriptive statistics for each sample are shown in Table 10. An ANOVA analysis found all domains had significant differences (p <.05) between groups. Unknown risks and risks to others were significantly different for all samples, but for other scales the only significant differences were between the student sample and the other two samples.

Correlations between subscales.

Correlations were calculated between the scales of the ERI-E to determine the degree to which each scale was related to other scales, including to the overall scale. Very low correlations could indicate a subscale that was measuring a distinctly different construct to the other subscales, and high correlations between subscales would indicate the domains were too similar to justify being distinct domains. The correlations between subscales are shown in Table 11 (for the community sample)[2].

The domains with the highest correlations with everyday risks are the health risks and risks involving personal danger subscales (0.69). These two scales also have the highest correlations amongst the subscales. Risks to others has the lowest correlations with both the other subscales, and the total ERI-E score.

[2] Note that correlations in Table 11 are different to those in Table 5. The correlations in Table 11 are simple correlations observed between the two scales, whereas those in Table 5 seek to model, and hence control for, the affect of other subscales on the correlation between the two factors (Kline, 2011).

Table 10

Descriptive statistics for ERI-E subscales (using ANOVA)

	Student	Community	Internet
	M (SD)	*M (SD)*	*M (SD)*
Risks to belongings[a]	19.57 (4.00)	18.66 (5.00)	18.09 (5.23)
Unknown risks[b]	21.42 (3.97)	18.16 (4.83)	19.11 (4.94)
Risks involving personal danger[a]	17.68 (4.42)	14.69 (4.97)	15.67 (4.66)
Risks to others[a]	11.94 (3.30)	11.22 (3.54)	10.91 (4.09)
Social risks[b]	21.18 (3.54)	18.52 (3.98)	19.90 (4.39)
Health risks[a]	19.36 (4.17)	16.80 (5.17)	17.32 (4.81)
Everyday risks[a]	111.15 (16.94)	98.06 (21.84)	101.00 (20.88)

[a] Student sample significantly different to other samples (p=0.05)

[b] All samples significantly different

Table 11

Correlations between ERI-E subscales

	Risks to belongings	Unknown risks	Risks involving personal danger	Risks to others	Social risks	Health risks
Unknown risks	.52**					
Risks involving personal danger	.62**	.63**				
Risks to others	.48**	.43**	.62**			
Social risks	.45**	.57**	.57**	.39**		
Health risks	.60**	.58**	.69**	.52**	.53**	
Everyday risks[1]	.67**	.68**	.80**	.60**	.63**	.74**

[1]When correlating subscales of the ERI with the full scale, items from the relevant subscale have been removed.

** - significant at the 0.01 level

2.3.2. Factor Structure of the DASS-21

2.3.2.1. Initial data analysis.

All analyses for the DASS-21 were undertaken using the community sample, as this was the population which the DASS has not been used with before, and therefore requires validation of the factor structure. However, to ensure the measure was suitable for use with all samples, factor analysis was also undertaken for other samples and the results are shown in Appendix D.

Missing Data.

The presence of incomplete data for the sample was minimal. There was a missing data rate of approximately 0.1% across all respondents, approximately one missing response for every 50 respondents. Only one participant did not respond to at least 19 of the 21 items, and they were excluded from further analysis. A number of options for dealing with missing data were considered. As the missing data occurred across a significant number of respondents, with few respondents missing more than one item, single imputation was a better option than case deletion, and replacing missing data with the mean for that particular item has a minimal effect on estimates (Schafer & Graham, 2002), meaning more complicated methods of replacing missing data is not necessary.

Outliers.

There were no univariate outliers detected, with all items scoring the full range of responses. Multivariate outliers were analysed on the seven items that comprise the individual scales, using Mahalanobis distance calculations. There were no large Mahalanobis distance scores to indicate there were any multivariate outliers.

Normality assumptions.

Individual item analysis was undertaken in order to identify items that did not meet the normal distribution requirements for both explanatory and confirmatory factor analysis. The values are presented in Table 12. All items scored a full range of responses. A number of items had high scores for both skewness and kurtosis, particularly items 7 and 21. These items measured whether people had experienced trembling, and whether they thought that life was meaningless. Scores on the DASS are expected to have a positive skew, as a significant proportion of the population do not experience significant anxiety, depression, or stress. For anxiety and depression items, the average score per item is less than one, and in the norm sample all scales were significantly positively skewed (Lovibond & Lovibond, 1993). The items do not meet the normality requirement for factor analysis, but this is not shown to have a large influence on

Table 12
Descriptive statistics for items of DASS-21

	Minimum	Maximum	*M*	*SD*	Skewness	Kurtosis
DASS1	0	3	.87	.861	.904	.321
DASS2	0	3	.61	.866	1.343	.920
DASS3	0	3	.40	.651	1.661	2.587
DASS4	0	3	.25	.586	2.729	7.874
DASS5	0	3	.70	.781	1.002	.597
DASS6	0	3	.76	.820	.895	.208
DASS7	0	3	.24	.609	3.049	9.727
DASS8	0	3	.46	.750	1.648	2.091
DASS9	0	3	.41	.719	1.856	3.058
DASS10	0	3	.36	.691	2.084	3.969
DASS11	0	3	.67	.735	.896	.417
DASS12	0	3	.71	.861	1.146	.665
DASS13	0	3	.50	.725	1.486	2.016
DASS14	0	3	.69	.757	.940	.531
DASS15	0	3	.24	.579	2.458	5.530
DASS16	0	3	.36	.659	2.005	4.030
DASS17	0	3	.30	.664	2.406	5.536
DASS18	0	3	.64	.738	1.033	.757
DASS19	0	3	.38	.729	2.078	3.910
DASS20	0	3	.20	.522	2.837	8.245
DASS21	0	3	.21	.579	3.200	10.563

results for exploratory factor analysis (Muthen & Kaplan, 1985). For CFA non-normality does lead to an increase in χ^2 values, and this needs to be taken account of in analysing the results (Curran, West & Finch, 1996). One of the criteria used in recommending fit indices for CFA is that they are not overly sensitive to skewed distributions, and this is the case for all fit indices used in this analysis (Hu & Bentler, 1998).

Exploratory Factor Analysis (EFA).

Before conducting the EFA, analysis of the data meeting the requirements for the method used was undertaken. The items are in most cases approximately normally distributed, and all cover a full range of values. There were also no outliers detected that would affect the analysis. There are more than four variables for each factor, and approximately fifteen cases per variables, with

an overall sample size of over 300. The results for the EFA run using principal components analysis (PCA), with an oblimin rotation, are shown in Table 13, with the factor correlations in bold showing the highest factor loadings. The stopping rule used was eigenvalues greater than 1. PCA was used as this method explains the maximum amount of variance in the original set of variables. Oblimin rotation was used as previous research has shown the factors to significantly correlate with each other (Lovibond & Lovibond, 1993), and oblimin rotation is an oblique method of rotation that allows for factors to be correlated. The three factors explain 58% of the variation in scores. The correlation between factors 1 and 2 was .51, between factors 1 and 3 was 0.61, and between factors 2 and 3 was 0.51.

All items, apart from two, loaded adequately onto their respective factor, in all cases with items they were expected to load on to, with factor 1 being depression, factor 2 - anxiety, and factor 3 - stress. The two exceptions were Item 5 (I found it difficult to work up the initiative to do things), which had a low loading on the depression factor it was expected to load onto, and Item 9 (I was worried about situations in which I might panic and make a fool of myself), which loaded onto a different factor than was expected (stress rather than anxiety).

Confirmatory Factor Analysis (CFA).

Confirmatory factor analysis was run using the models that had shown to be the best fit for the data in previous research (Henry & Crawford, 2005). The two different models tested were the original model, with three subscales (Anxiety, Depression and Stress) loading onto a General Psychological Distress (GSD) factor, and the Quadripartite model, where each item loaded onto both its own subscale and the GSD factor. The models tested are shown in Appendix E. The quadripartite model was tested as some research indicates that the DASS Stress scale should be regarded as a measure of GSD instead of a measure of stress distinct from GSD (Henry & Crawford, 2005).

Henry and Crawford (2005) used correlated errors in the models to improve the fit of the data, but did not have any theoretical justification for why the errors should be correlated, an approach generally not considered appropriate in CFA (Kline, 2011). Two additional analyses were run where only correlated errors that were theoretically justified were allowed, of which there were three pairs. The first pair was item 4 (I experienced breathing difficulty), and item 19 (I was aware of the action of my heart in the absence of physical exertion), which shared a similar type of physical sensation associated with anxiety. The second pair was item 1 (I found it hard to wind down) and item 12 (I found it difficult to relax), which are very similar items

Table 13
Factor loadings for DASS-21 using EFA

	Pattern Matrix			Structure Matrix		
	Component			Component		
	1	2	3	1	2	3
DASS1	.088	-.042	**.633**	.450	.320	.665
DASS2	.133	**.423**	.031	.366	.506	.323
DASS3	**.597**	-.145	.300	.705	.308	.590
DASS4	-.046	**.919**	-.139	.336	.826	.293
DASS5	**.315**	.248	.191	.557	.503	.506
DASS6	-.076	.046	**.787**	.425	.402	.764
DASS7	.101	**.672**	.069	.483	.757	.467
DASS8	.003	.417	**.525**	.533	.681	.736
DASS9	.227	.261	.387	.594	.570	.655
DASS10	**.901**	-.056	-.021	.860	.391	.498
DASS11	.036	-.015	**.810**	.520	.409	.825
DASS12	.081	.071	**.697**	.540	.461	.781
DASS13	**.691**	-.016	.189	.797	.429	.600
DASS14	.002	.142	**.588**	.430	.437	.660
DASS15	.279	**.415**	.188	.604	.651	.565
DASS16	**.795**	.076	.000	.833	.479	.520
DASS17	**.700**	.200	-.039	.777	.535	.486
DASS18	.001	-.071	**.768**	.431	.314	.733
DASS19	-.073	**.747**	.170	.410	.796	.500
DASS20	.161	**.519**	.170	.527	.685	.527
DASS21	**.877**	.049	-.115	.832	.436	.442

Note: (items in bold are highest loadings on the respective factor)

measuring different aspects of heightened arousal occurring due to stress. The third pair was item 17 (I felt I wasn't worth much as a person) and item 21 (I felt that life was meaningless) which measure a level of dysfunctional belief in depression, rather than being based on present symptomology, as most other items on this scale are. A further correlation was allowed between

item 8 (I felt I was using a lot of nervous energy) and the anxiety scale, as nervous energy is also a symptom of anxiety (this was only allowed for the original model as in the quadripartite model this item also loads onto the general psychological distress scale). The results are shown in Table 14 for the community sample, and for the other samples in Appendix D. The models are shown in Appendix E.

The quadripartite model has better overall fit for the data than the original model, but the original model with correlated errors is also a good fit for the data. Allowing theoretically driven correlated errors only has a small affect on the fit statistics. The factor loadings for the quadripartite model are shown in Table 15, and for the original model in Table 16.

For the quadripartite model the items generally load more highly onto the *General Psychological Distress* scale than the individual scales, indicating that a number of items measure this construct more than the constructs of anxiety, depression and stress. This is particularly true for the stress scale, with five items of very low loading, including three with negative loading values. This means these items are non-specific to stress, and are largely measuring general psychological distress. Four items on the anxiety scale also have very low loadings (all less than 0.25) onto that scale. Almost all depression items load well onto both the depression and general psychological distress scales. For the original models all items load well onto their scales, with only one falling below 0.5, and a majority above 0.7.

Table 14

CFA fit indices results for different models of the DASS-21

Model	$\chi 2$	*df*	CFI	TLI	RMSEA
Original model with general factor	571	186	0.887	0.873	0.082
Original model with general factors and unlimited correlated error	343	177	0.952	0.943	0.055
Original model with general factors and limited correlated errors	407	182	0.934	0.924	0.064
Quadripartite model	431	168	0.923	0.904	0.072
Quadripartite model with unlimited correlated errors	295	160	0.961	0.948	0.052
Quadripartite model with limited correlated errors	344	165	0.948	0.933	0.060

Table 15

Factor loadings for quadripartite model of DASS-21 with theoretically justified correlated errors

Item	Scale	Standardised	Unstandardised
DASS2	Anxiety	0.226	1
DASS4	Anxiety	0.675	1.765
DASS7	Anxiety	0.380	1.095
DASS9	Anxiety	0.080	-0.118
DASS15	Anxiety	0.154	0.224
DASS19	Anxiety	0.499	1.143
DASS20	Anxiety	0.221	0.332
DASS3	Depression	0.372	1
DASS5	Depression	0.213	0.632
DASS10	Depression	0.584	1.533
DASS13	Depression	0.435	1.225
DASS16	Depression	0.486	1.183
DASS17	Depression	0.339	0.784
DASS21	Depression	0.468	0.969
DASS1	Stress	0.511	1
DASS6	Stress	-0.084	7.032
DASS8	Stress	0.181	-0.148
DASS11	Stress	-0.107	8.604
DASS12	Stress	0.380	2.577
DASS14	Stress	-0.189	5.473
DASS18	Stress	-0.118	6.735
DASS1	General Psychological Distress	0.398	1
DASS2	General Psychological Distress	0.438	0.797
DASS3	General Psychological Distress	0.714	1.478
DASS4	General Psychological Distress	0.686	1.165
DASS5	General Psychological Distress	0.591	1.281
DASS6	General Psychological Distress	0.640	0.994
DASS7	General Psychological Distress	0.587	1.021
DASS8	General Psychological Distress	0.561	1.211
DASS9	General Psychological Distress	0.597	1.157
DASS10	General Psychological Distress	0.659	1.313
DASS11	General Psychological Distress	0.636	1.185

Table 15 cont.

DASS12	General Psychological Distress	0.620	1.180
DASS13	General Psychological Distress	0.573	0.958
DASS14	General Psychological Distress	0.584	1.330
DASS15	General Psychological Distress	0.682	1.375
DASS16	General Psychological Distress	0.780	1.692
DASS17	General Psychological Distress	0.767	1.385
DASS18	General Psychological Distress	0.742	1.690
DASS19	General Psychological Distress	0.630	1.176
DASS20	General Psychological Distress	0.642	1.142
DASS21	General Psychological Distress	0.591	1.092

The Crobach's Alpha values for all factors were above 0.8 indicating good internal consistency. Anxiety had the lowest value (0.83), and depression the highest (0.89), and the value for stress was 0.87. The reliabilities for the subscales (anxiety, depression and stress) apply to all models, The general psychological distress Cronbach's Alpha value was 0.94, which is for the quadripartite model only.

Table 16
Factor loadings for original model of DASS with theoretically justified correlated errors

Item	Scale	Standardised	Unstandardised
Anxiety	General Psychological Distress	0.922	0.347
Depression	General Psychological Distress	0.865	0.388
Stress	General Psychological Distress	0.896	0.435
DASS2	Anxiety	0.436	1
DASS4	Anxiety	0.543	0.843
DASS7	Anxiety	0.694	1.120
DASS9	Anxiety	0.735	1.398
DASS15	Anxiety	0.741	1.136
DASS19	Anxiety	0.662	1.276
DASS20	Anxiety	0.707	0.978
DASS3	Depression	0.690	1
DASS5	Depression	0.601	1.045
DASS10	Depression	0.801	1.233
DASS13	Depression	0.792	1.278
DASS16	Depression	0.808	1.184
DASS17	Depression	0.713	1.054
DASS21	Depression	0.730	0.941
DASS1	Stress	0.564	1
DASS6	Stress	0.703	1.187
DASS8	Stress	0.738	1.139
DASS11	Stress	0.799	1.210
DASS12	Stress	0.727	1.289
DASS14	Stress	0.638	0.994
DASS18	Stress	0.663	1.007

2.4 Discussion

2.4.1 Factor Structure of the ERI-E

The changes made to the ERI-E have substantially improved its reliability. The additional items have meant a scale of 36 items has been constructed that is a moderate to good fit for the data, and the internal consistency is adequate for the subscales as shown in Table 9, particularly for the general community sample. There was little difference in fit between the two models, with both a single factor solution, and a multifactor solution having almost identical fit indices. This was in spite of fit indices being chosen which favour more parsimonious models. When there is no difference between the suitability of models choosing the more parsimonious model is often preferred, but in this case the fit indices already favour these models. Given the lack of a difference between the fit indices for these models a decision about which model is preferred was based on three factors; what previous research has shown in terms of everyday risk taking being a single domain or multiple domain construct; analysis of other psychometric properties, such as internal consistency, item loadings, and domain correlations to indicate which model is most suitable; and the face validity of the items in each domain.

In previous research a majority of the literature suggests that everyday risk-taking is a multifactor construct (e.g. Tulloch and Lupton, 2003; Weber & Blais, 2002). Although the domains of everyday RTB may require more development, the relatively consistent, but only moderate, correlations between the domains of the ERI-E (see Table 11) indicate they are measuring distinctly different aspects of everyday risk taking. The noticeably higher correlation of the risks involving personal danger domain with the overall scale indicates this construct plays a particularly important role in everyday risk taking.

In terms of the second factor (psychometric properties), the factor loadings for the six-factor model are higher than those for the single factor model, indicating that there is some degree of domain specificity in everyday risk taking. Item loadings for the single factor model average 0.52, and for the multiple domain model average 0.62 (for the community sample). In regards to the correlations between the factors (see Table 11), and with overall everyday risk taking, the relationships are as would be expected for a multi domain model, moderate correlations between individual domains, and in almost all cases the highest correlation being with the overall scale, rather than another domain. The highest correlation between subscales is 0.69, and the lowest is 0.39, so the shared variance between domains is between 15% and 50%. This shows a degree of convergent and discriminatory validity, that there is some shared variance indicates convergent validity, they share some common factor. That all subscale correlations are below 0.7 indicates discriminant validity, in all cases they share less than half of the explained variance with any

other subscale. Further evidence of discriminant and convergent validity is from analysing which subscales have the highest and lowest correlations. The lowest subscale correlation is between risks to others and social risks, which is expected as one is concerned about the effect on the individual, and the other the effect on other people. The highest correlation is between risks involving personal danger, and health risks. These are similar domains in that both involves physical damage to an individual, one from injury, the other from sickness, and therefore were expected to be more highly correlated than other domains. In general the level of internal consistency within domains is also adequate (particularly for the community sample), especially given the relatively low number of items in each domain.

In terms of the third factor analysis of the items indicates the items are appropriate for the domains, a measure of face validity. In most instances the items are clearly measuring an aspect of the domain they are expected to measure, for example all the items involving risks to belongings clearly belong in this category.

Significant improvements were also made to the loadings of each item onto the relevant subscale from the previous research with the ERI-E, particularly for the community sample. Previously these were between 0.30 and 0.67 (Hunt, 2008), and have now improved to between 0.47 and 0.70 for the community sample, and are 0.33 or above for the other samples. These improvements have been made without significant increases being made in the average inter-correlation of individual items. The ERI-E therefore does not suffer from the problem of bloated specifics, where high internal consistency is due to high correlations between similar items (Cattell, 1973; in Kline, 2000). Individual items also have good psychometric properties, with every item having a full range of responses, and no items having extreme values for skewness or kurtosis. The means for a majority of items is close to the middle of the range, approximately 3.

There were significant differences between the samples. The sample which was the best fit for the data was the community sample. This sample had the widest range of ages represented, and was closest to a random sample. The average age for this sample was also significantly higher than for other samples, and the higher internal consistencies may reflect a more consistent view of risk in the different domains that develops with age. These results are in contrast to research on the DOSPERT which found it more consistent for student samples than for community samples, (Blais & Weber, 2006a). This suggests that if the aim of research is to extrapolate research results into conclusions for the general population, the ERI-E is a better questionnaire to use than the DOSPERT, but the DOSPERT may be better for measuring risk taking relevant in tertiary student populations.

The worst fit was for the internet sample, but the worst internal consistencies were for the student sample. The internet sample size was low for a CFA, which may explain why the fit indices were poor (Kline, 2011). One problem with the fit indices used is that larger numbers of items and factors lead to smaller goodness of fit values, due to the omission of correlated error variance, and small theoretically insignificant factor loadings (Cheung & Rensvold, 2002).

In summary, the ERI-E is a reliable and valid tool for use with general population samples, but there are problems with internal consistency for student samples, and to a lesser extent the internet sample, which may indicate difficulties for use with international participants. This is similar to the results of other measures of everyday risk taking where internal consistencies vary between groups, including between countries (Blais & Weber, 2006b). It is possible that everyday risk taking is not perceived in the same way in different countries (even similar ones). Different measures may be required for different groups, in terms of both age and nationality.

There were some differences in the internal consistency of the domain scales, but in general Cronbach's alpha values were similar across scales, less so across samples. The most internally consistent scales varied between samples, with risks involving personal danger generally the most consistent, but for the internet sample risks to others had the highest Cronbach's alpha value. As expected the internal consistency was highest for the single factor solution, given the larger number of items composing this scale (Huysamen, 2006).

The new scales had on average slightly lower correlations with the full scale measure than for previous research with the ERI-E (Hunt, 2008), but all values exceeded 0.5, and there were no correlations between subscales of less than 0.3. Social risk taking has the lowest correlation with the ERI-E for the student sample, but is of a similar magnitude to other domains. Correlations between domains were higher in the ERI-E than for the DOSPERT overall, but results from the DOSPERT were inconsistent. In one sample using the DOSPERT the social scale had non-significant correlations with all other subscales, and a correlation with the total score that was mostly explained by the items they had in common. In another sample the correlations between subscales were higher, but with most subscale correlations under 0.5 (Weber et al., 2002). The higher subscale correlations shows that the ERI-E domains measure a shared factor of everyday risk taking, something that is less certain with the DOSPERT.

In terms of subscale correlation with overall everyday risks, the highest value was for the risks involving personal danger subscale, and the next highest was health risks (Table 11), which was similar to results from the DOSPERT (Weber et al., 2002). The lowest correlation was with risks to others, which also had low correlations with other subscales, particularly social risks and unknown risks. It may be therefore that risks to others may be seen differently to risks that

involve the individuals themselves. The correlation between risks to others and everyday risks was still above 0.6, which was not significantly lower than other domains correlation with the total ERI-E score, so it does seem to be measuring some aspect of everyday RTB.

The multi-factor ERI-E is a suitable tool for use in research. It has good psychometric properties, with adequate reliability and validity. It is best suited to use with general population samples, with its suitability for use with student populations less certain, primarily due to the poor internal consistency of some subscales. More research is necessary to assess its suitability for use in different countries, but the evidence from this study is that it does have validity in countries other than New Zealand. Although the internet sample fit indices were lower the smaller sample size is a possible reason for this result. The domains used have some validity, but further research is required to provide further evidence of their construct validity, particularly evidence of convergent and divergent validity. Studies with social phobia and OCD samples would aid this research, as these groups would be expected to have higher correlations with some domains than other, people with social phobics with social risks, and people with OCD with risks to others, and risks to health (depending on the nature of their OCD symptoms).

2.4.2 Factor Structure of the DASS-21

The results of the factor analysis in the present research are as good, or better, than that for previous samples using the DASS-21 (Henry & Crawford, 2005), so it is suitable for use with a New Zealand population. It includes reliable factors for both anxiety and depression, as well as being a reliable measure for the degree of general psychological distress. Although the quadripartite model fits the data slightly better than the original model, there are some psychometric difficulties with this that make it not so suitable. Almost half the items do not load adequately onto their specific factor once the loading onto the general psychological distress factor is taken into account. In particular the stress scale items have very low loadings, some of a low negative value. This is consistent with previous research, and the original reason for the development of the quadripartite model (Henry & Crawford, 2005). What this indicates is that items on the stress scale are measuring general psychological distress rather than a separate specific construct of stress. The DASS-21 may be more accurately seen as measuring three factors, subscales for anxiety and depression, and an overall factor of general psychological distress, measured by all 21 items. Stress is not a specific factor, and it is questionable whether this should be used as such in research.

The original model CFA has high factor loadings for all items, and a high correlation between factors. The fit for this model is good, once correlated errors are allowed. These are justified theoretically, as a number of items are quite similar. The items loadings values for the EFA are in general good, but there are some items which load highly onto both the anxiety and stress

scales. The two items which had low loadings onto their respective factors (Items 5 and 9) had similar loadings in past research (Henry & Crawford, 2005). This fits into the CFA results showing that the stress scale is more of a measure of general psychological distress than a scale measuring a separate construct. Results are similar to previous research, and the DASS-21 measures these constructs similarly in New Zealand as it does in other countries.

2.5. Conclusion

The results of this chapter show that is spite of some limitations the ERI-E and the DASS-21 are suitable measures to be used in the present research. The ERI-E is a reliable measure of everyday RTB across multiple domains for community samples (in particular). The DASS-21 has been shown in previous research to be a good measure of people's levels of anxiety, depression, and general psychological distress, and these results were replicated with a New Zealand general community sample. Therefore the ERI-E and DASS-21 will be used in the next two chapters to measure the relationships between anxiety, depression, and different domains of everyday RTB.

Chapter 3: Anxiety, Depression and Everyday Risk Taking Behaviour

3.1. Introduction

There has been a significant amount of research into the relationship between anxiety, depression and RTB, including some specifically looking at everyday RTB. Within this research some domain specific RTB has been identified. Some of the research into RTB has also identified important socio-demographic variables associated with differences in RTB. This section will review the literature in these different areas, identify areas where further research needs to be conducted, and develop hypothesis to determine relationships between anxiety, depression, and everyday RTB that will be analysed in this research. Given the lack of research specifically investigating everyday risks, the literature will review RTB more generally to enable hypotheses to be developed, in particular for domain specific everyday RTB. The terms anxious people, anxiety level, depressed people, and depression level in this research are in relationship to people's scores on measures of these constructs, rather than them having a diagnostic anxiety or depressive disorder.

3.1.1. The Anxiety – Risk Relationship

3.1.1.1. Relationship between anxiety and RTB.

The relationship between anxiety and risk has been studied in various forms. The most general conclusion is that high anxiety is associated with higher levels of risk avoidance (Eisenberg, Baron & Seligman, 1998; Maner et al., 2007), and an exaggerated tendency to engage in risk-avoidant decision making across a range of behavioural contexts (Maner & Schmidt, 2006). These results occurred when comparing clinical and non-clinical samples (Maner et al., 2007), and correlations between anxiety and RTB measures for a tertiary student sample (Eisenberg et al., 1998), indicating that this relationship exists in general population as well as clinical samples. Anxious people live in a world of inflated subjective risk (Stöber, 1997), perceiving risks as being higher in a wide range of situations, and avoiding risks for a variety of different reasons, including avoiding taking risks, even when they should (Eisenberg et al., 1998). Even in a study that did not find anxiety significantly correlated with risk perception and risk behaviour, the correlation between anxiety and RTB was of a similar magnitude to that of other studies, however this research had a small sample size, comprising only 34 students, with associated lack of statistical power (Hockey et al., 2000). It also used induced anxiety (essentially a measure of state anxiety) rather than measuring trait anxiety for one part of the research, and state anxiety has been shown to less important in explaining RTB than trait

anxiety (Maner & Schmidt, 2006). Research on the relationship between anxiety and RTB has involved studying many different types of risks.

3.1.1.2. Types of risks avoided by anxious people.

Some of the areas anxious people have been shown to avoid risks are in social situations (such as initiating conversations) (Kashdan et al., 2006), tasks involving gambling (Raghunathan & Pham, 1999), some environmental risks (such as pollution), and outdoor activities (Bouyer, Bagdassarian, Chaabanne & Mullet, 2001). There is a general tendency for people to avoid risks to themselves, rather than those related to the general public, both in terms of risk perception (Kallmen, 2000), and risk behaviours (Eisenberg et al., 1998). Anxious people also show a particular bias towards taking low risk options (Lauriola & Levin, 2001). In gambling tasks the bias was towards low-risk/low-reward options, but this was not evident when making decisions on behalf of someone else (Raghunathan & Pham, 1999). It is therefore expected that anxious people will be more avoidant of risks where harm may come to themselves, than if the harm would come to others.

In terms of environmental risks, anxiety was associated with increased risk perception (Kallmen, 2000) but there was no difference between anxious and non-anxious groups in estimating risks to themselves (Nesse & Klaas, 1994). Most anxious people are risk averse in regards to alcohol and drug use (Wagner, 2001), with the exception being a group of socially anxious and depressed individuals who may be more risk seeking in domains such as heavy drinking, illicit drug use, unsafe sexual practices, and acting aggressively (Kashdan et al., 2006; Teichman et al., 1989). This may be due to these individuals engaging in risky activities to regulate their emotions, such as using alcohol to reduce the anxiety they feel when they interact with other people. The relationship between anxiety and risk avoidance in different domains is complex, and it is expected that anxious people will be inconsistent in their everyday RTB, across domains and situations.

3.1.1.3. Reasons for risk avoidance in anxious people.

One of the dominant themes in the research is the avoidance of risk in threatening situations. Anxious people are more likely to see ambiguous events as threatening, and are more likely to be risk averse to these situations (Butler & Mathews, 1983). They believe that threatening events (particularly to health) are more likely to happen to them, rather than thinking positive events are less likely (Blais & Weber, 2006a). An example of this is socially anxious individuals tending to overestimate the likelihood that social events will be distressing, as well as how intense their distress will be (Maner & Schmidt, 2006). Also, changes in anxiety produces changes in the judgement of risk, and the threat associated with ambiguous information (Chen

& Craske, 1998). Chen & Craske (1998) also found cognitive biases to be related to anxiety, people with high levels of cognitive bias had less anxiety after exam results were posted, as they expected worse results than they achieved. Other cognitive factors have also been shown to be associated with RTB.

Worry is the main cognitive factor researched in relationship to RTB. Feelings of fear or worry in the face of decisions involving a degree of uncertainty have an all or nothing characteristic. People with high levels of worry or fear are sensitive to possibility rather than the probability of negative consequences (Loewenstein et al., 2001). The sensitivity to the possibility of negative consequences is particularly heightened in anxious individuals, as they are intolerant of uncertainty (Dugas, Freeston & Ladouceur, 1997). They tend to focus on the possibility of bad outcomes, rather than good (Eisenberg et al., 1998). It is therefore likely that risk situations where a wide range of possible negative outcomes exist will be avoided more by anxious people than those situations where the possible negative consequences are more limited. An example of limited negative consequences is leaving an item unattended outside you house, where the risk is that it could be stolen. Comparatively, moving to a new job in a new city could have many different negative consequences, such as loss of social relationships, problems finding suitable accommodation and employment, and being exposed to a more dangerous environment. Emotional reactions to risk also affect RTB in anxious people.

Emotional reactions to risk, such as fear and worry, often diverge from cognitive evaluations of risk severity (Loewenstein et al., 2001), for example anxious people are often aware there is little or nothing to fear in situations they find so difficult (Barlow, 2002). Trait anxious individuals were also reluctant to reduce the influence of their anxious feelings when making judgements of risk, and as the object of judgement became more relevant to their anxiety (e.g. they felt a danger to themselves) this difference increased (Gasper & Clore, 1998). Positive outcome expectancies were also important, as these moderated the relationship between social anxiety and sexual risk taking. Socially anxious individuals expecting desirable outcomes reported the greatest risk-taking behavioural intentions whereas socially anxious individuals expecting undesirable outcomes reported the least risk-taking intentions (Kashdan et al., 2006).

Trait anxious individuals have a strong tendency to notice and rely on anxiety relevant information (Gasper & Clore, 1998). Appraisal biases present include heightened perceptions of the likelihood and intensity of possible negative outcome and reduced perceptions of personal control (Maner & Schmidt, 2006). There is a self-perpetuating cycle in which anxiety acts as an input into the decision making process, then risk avoidant decision making promotes further anxiety, and risk avoidant behaviour (Maner et al., 2007).

3.1.1.4. Trait vs. state anxiety and RTB.

Trait anxiety is a stronger predictor of risk taking than state anxiety (Maner & Schmidt, 2006), and trait anxiety explains almost all the difference in anxious individuals estimating risk[3] (Gasper & Clore, 1998; Hockey et al., 2000). There is a global effect of trait anxiety on the probability and utility for both positive and negative events, whereas neither state anxiety, nor control variables such as social desirability or depression, could explain any variance in the appraisal of risk and chance (Stöber, 1997). In measuring the effect of anxiety on RTB, it is therefore preferable to use measures of trait anxiety rather than state anxiety.

3.1.1.5. RTB for different types of anxiety disorders.

There is some variability in the RTB of people with different types of anxiety related disorders. Risk aversion is particularly associated with people with OCD (Woods, Frost & Steketee, 2002). For example the presence of a primary diagnosis of OCD is particularly linked to low risk taking, with anxiety and depression alone not sufficient to explain risk averse behaviour (Rees, Anderson & Egan, 2005). Patients with OCD were also more risk averse in terms of everyday risk taking than a control group (Steketee & Frost, 1994). In people diagnosed with OCD there was an increased likelihood of taking risks perceived to have potential negative consequences for themselves as opposed to others (Rees et al., 2005). Another specific type of anxiety in which there has been research undertaken is social anxiety. People who were socially anxious showed a similar risk aversion to people with trait anxiety (Maner et al., 2007), but not surprisingly had higher risk perception for social events (Maner & Schmidt, 2006). The Maner studies employed computer simulations of everyday risk taking, involving letting a balloon get as large as possible whilst trying to prevent it from popping (participants received raffle tickets in increasing amounts the larger the balloon got, without it popping), rather than responses to self-report questionnaires, which may have influenced the results.

3.1.1.6. Summary of anxiety – RTB relationship.

In summary, anxious people are expected to be risk averse for all everyday RTB domains, but it is also expected that there will be some domain specificity in the types of risks they avoid. In general they will be least avoidant of social risks and risks to others, and most avoidant of health risks and unknown risks. These relationships have been shown to occur for both clinical and general population samples (Eisenberg et al., 1998, Maner et al., 2007). Research is advanced in this area by investigating the domain specific relationships between anxiety and everyday RTB, which have not been researched previously.

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[3] See section 2.2.2.2 for a discussion on what trait anxiety is measuring.

3.1.2. The Depression – Risk Relationship

3.1.2.1. Relationship between depression and RTB.

There is a range of research evidence showing people with depression view risk differently, and are more likely to be risk averse, than those not suffering from depression. Individuals in an induced negative mood were significantly more conservative in taking risk than those in a neutral mood, whilst elated mood did not significantly differ from neutral mood (Yuen & Lee, 2003). Depressed people view all negative events as more likely (Butler & Mathews, 1983), for example they are more likely to overestimate the likelihood of death from a variety of causes (Boholm, 1998). In adults depression has a stronger link with RTB than with risk perception, higher depression is associated with being risk averse but not with higher levels of risk perception (Hockey et al., 2000). However the affect of depressive symptoms on risk perception may differ, depending on the type of risk perception. In one study the effect of depression on risks that have a more evaluative aspect to them (such as comparative value of costs and benefits of taking risks), was higher than on risk estimation (assessing the likelihood of different types of risks), which is largely cognitive (Curry & Youngblade, 2006). These results indicate that there are significant relationships between depression and a number of different aspects of risk taking and risk perception, with depressed people tending to be risk averse, and perceiving risks as being greater for some types of risks. However, there is in general a lack of research on the aspects of depression, (such as lack of motivation, rumination and helplessness) that may lead to risk averse behaviour.

3.1.2.2. Factors affecting the depression – RTB relationship.

A range of variables are related to differences in RTB amongst depressed people. Depressed people assign greater weights to risks generally than non-depressed people. They are more likely to be sensitive to future positive consequences than with insensitivity to immediate situations, such as the damage that could be done to social relationships (Allen & Badcock, 2003). The motivation to protect self-esteem from future threats is more potent than the motivation to avail themselves of the benefits of social interaction (Pietromonaco & Rook, 1987), and therefore depressed people are likely to be more risk averse for social risks. The link between depression and risk avoidance is particularly related to inactivity (Eisenberg et al., 1998), and this is particularly important in decisions about initiating social intimacy, where people who are depressed expressed a greater reluctance to take action, and their perception of risk appears to exert a stronger influence on their decisions (Pietromonaco & Rook, 1987).

A range of different biases evident in depressed people are important in the link between depression and RTB. In depressed people negative content receives greater attention, or is more

accessible in memory, thus increasing the probability that information congruent with the current depressed mood will be recalled (Beck, 1967). They are also more sensitive to the potential negative consequences of their behaviour (Pietromonaco & Rook, 1987), however one researcher found that this negativity in thought is restricted to views about themselves, and does not extend to thoughts about others (Pietromonaco & Markus, 1985). High-risk/high-reward options are more also likely to be favoured (Lauriola & Levin, 2001), but only when expecting to experience the consequences of their decision, not when making decisions on behalf of someone else (Raghunathan & Pham, 1999). In children depressed mood made them more risk taking when scenarios were described in terms of losses rather than gains (Levin & Hart, 2003), but whether this is also true for adults has not been researched.

One reason for the relationship between depressed state and risk taking is that negative states can increase analytic processing directed towards the source of the problem, while positive states give rise to simpler heuristic strategies, which is likely to lead to reduced risks if the potential consequences of taking risk are thought through more fully (Hockey et al., 2000). It may also be that risk avoidant behaviour is due to risks being more salient in memory for depressed people, and this will cause some risks to be avoided (Pietromonaco & Rook, 1987). Where risk scenarios do not involve a significant cognitive component, and rather rely on quick responses to questions, the risk averse behaviour of depressed people may be reduced. The risk scenarios used in the present research (self report measures) are unlikely to involve a significant cognitive component, compared to situations such as gambling scenarios which generally involve considering risk over a longer period of time[4]. A lower correlation is therefore expected between RTB and depression in this research, compared to those assessing RTB that involve a more significant cognitive component. An individual's mood whilst completing the questionnaires may also affect their responses.

3.1.2.3. Trait vs. state mood and RTB.

The relationship between state and trait mood in risk evaluation is quite complex. When people were in a more positive emotional state they assessed risks to be lower in some situations (Hogarth, Portell & Cuxart, 2007), but another study found that RTB was only related to trait differences in mood (Hockey et al., 2000). People in a positive mood are likely to avoid actions which risk changing their positive mood whereas people in a negative mood are more likely to avoid actions that make them feel worse. Both groups are likely to choose options with a high chance of success (Isen & Geva, 1987). It is therefore possible that those who are prepared to take the highest risks are those in a more neutral mood state. The relationship between

[4] See section 5.2 for discussion of the limitations of using self-report measures.

depression and RTB may not be linear, risk aversion may occur least at moderate levels of depression.

3.1.2.4. Domain specific relationships between depression and RTB.

One of the most important relationships between depression and RTB is in the area of social risk. The social risk hypothesis of depressed mood is an evolutionary theory to explain depression. It theorises that depressed people reduce their social risk taking to reduce the chance of exclusion from social contexts while in a negative mood state, and to lessen their cost to their community. These individuals would also be unwilling to take social risks that could make them feel worse, and increase their alienation from their community. They would therefore reduce their social risk taking to within kinship bonds (Allen & Badcock, 2003). Therefore, the depressed have somewhat fewer social interactions, and those they engage in are likely to be more negative, which will cause them to become more negative about social situations in general. By avoiding these situations they will then miss opportunities for gratifying social interaction, enhancing the cycle of low mood (Pietromonaco & Markus, 1985). If the theory is true then the avoidance of social risks should occur across a full range of depressive severity, and should be relatively specific to depression. This has been validated in research, where a positive relationship was found between positive affect and social risk taking propensity, after controlling for a number of personality variables. This was highly specific as there was no significant relationship between positive affect and participants financial and physical risk taking propensities (Allen & Badcock, 2003). Depressed people are likely to be less risk avoidant when they can expect to exercise control over the outcomes of social interactions, and more risk avoidant where the situation involves meaningful, and potentially long term social contact (Pietromonaco & Rook, 1987). It is expected that social risk taking will be lower in depressed people than in those who are not depressed.

3.1.2.5. Effect of anxiety on the depression – RTB relationship.

One of the difficulties in the finding in the literature of a correlation between depression and RTB is the high co-morbidity of anxiety and depression. Research has shown that up to two thirds of people with depressive symptoms have prominent anxiety symptoms, and one third may meet the diagnostic criteria for panic disorder (Sadock, Kaplan & Sadock, 2007). In studies that have taken into account the affect of anxiety on this relationship, all have found that anxiety mediates the link between depression and RTB, but there is little agreement in the extent of mediation (partial or full) (e.g. Eisenberg et al., 1998; Stöber, 1997). One study found that level of anxiety fully mediated the link between depression and RTB (Maner & Schmidt, 2006), one that anxiety only partially mediated the relationship, (Eisenberg et al., 1998), and one that found that the relationship between depression and RTB was reversed (depressed people were more

likely to take risks than people who were not depressed) when trait anxiety was partialled out in the statistical analysis (Stöber, 1997). Finally, another study found that neither anxiety nor depression could explain low levels of risk taking, and the only group that was lower in RTB was people who had a primary diagnosis of OCD (Rees et al., 2005), which may indicate that it is not depression or anxiety that predicts risk averse behaviour but OCD specifically. Amongst adolescents, concurrent involvement in risk behaviours predicted an increase in depressive symptoms, but only when co-occurring anxiety symptoms were relatively high (Sears & Armstrong, 1998). It is expected that the anxiety level will fully mediate any relationship found between depression and RTB, as only one researcher with a non-clinical population has found a significant relationship between depression and RTB once the mediating affects of anxiety are taken into account.

3.1.2.6. Summary of depression – RTB relationship.

In summary, depressed people are expected to be risk averse, but once the affects of anxiety are controlled for this relationship is not expected to be significant, anxiety will full mediate the relationship between depression and everyday RTB. Depressed people are also expected to be most risk averse for social risk taking, and most risk taking for health risks. The relationship between RTB and levels of depression may however not be linear, with moderate levels of depression associated with increased RTB. Research is advanced in this area by investigating the relationships between depression and domains of everyday RTB, and investigating whether there are non-linear relationships between RTB and depression.

3.1.3. Why Everyday Risks May be Different to Other Types of Risks?

Research on RTB involves many different types of risks such as gambling tasks, simulated risk taking (Maner et al., 2007), environmental risk taking (e.g. Slovic, 1987), and sensation seeking (e.g. Zuckerman, 1979). Although there are similarities in the types of risks used in the research, there are also likely to be differences depending on the types of risk studied. Everyday RTB differs in that people tend to be risk bearing in taking everyday risks, and cannot avoid risk altogether. Therefore understanding the factors that make people more risk averse for everyday risks will help to understand why everyday RTB may be different than other types of RTB.

Predictors of people being less risk averse include previous experience with a risk event (Houghton, Murray & Ball, 1999), with familiarity reducing risk perception and increasing risk behaviours (Houghton et al., 1999; Sitkin & Pablo, 1992). For instance, in adolescents, estimates of risk for behaviours people had engaged in were lower than for those they hadn't (Benthin, Slovic & Severson, 1993; Johnson, McCaul & Klein, 2002). High sensation seekers, are higher in risk taking than risk evaluation, but may not undertake activities involving real

threats of risk (Rosenbloom, 2003), and have minimal fear and anxiety in situations involving personal danger (Segal, 1973). People also worry about issues that have far reaching implications for society and individuals such as employment, medical care (Houghton et al, 1999) and environmental risks (Slovic, 1987).

The public will accept risks from voluntary activities that are 1000 times as great as from involuntary hazards that provide the same level of benefits, and view current risk levels as unacceptably high for many of these involuntary hazards such as nuclear power (Slovic, 1987). Small probabilities are overweighted in general, both in terms of fear of a negative outcome and hope of a positive outcome (Loewenstein et al., 2001). In terms of everyday risks, people will tend to be more risk averse where they are uncertain of the outcome. They are likely to be less risk averse for activities in which they have some experience of the risk, and also when the risk is not unusual or spectacular.

Another important element is that risk events are amplified by society (Jackson, 2006). Experience of risk is not just the experience of individual harm, but also the processes by which groups and individuals learn to acquire or create interpretations of risk (Kasperson, Kasperson, Pidgeon & Slovic, 2003). Although the role of the media is important in amplifying the perception of risk, concern over risk is also driven by interpersonal communication (Trumbo (1996), as cited in Kasperson et al., 2003). This partly explains why risk perception can vary greatly in different countries. For instance the fear of a car accident is greater in countries where road deaths are routinely reported in the media, compared to those where it is rarely reported (Boholm, 1998). Everyday RTB can be expected to vary between countries, and this is likely to be due to how the level of risk is discussed in the country, by both the media and individuals.

3.1.4. Socio-Demographic Characteristics and Risk

A large number of socio-demographic characteristics have been shown to have significant relationships to risk avoidance. Risk taking has been shown to be related to a person's ethnicity, and the country in which a person lives influences risk perception. Demographic characteristics such as age and gender, and socio-demographic characteristics such as income and whether people live in cities or towns, have also been shown to influence RTB.

3.1.4.1. Nationality and RTB.

One of the most important characteristics is the country in which a person lives. Most of the literature showing differences between countries are in the area of environmental risk judgements, and it has been shown that both the size of the country, and the nature of the society is important. For instance, in the United States risks from various causes were rated twice as likely as in Hungary (Boholm, 1998). Conversely, in terms of everyday risks, people

from the United States were significantly more likely to take risks than Australians (Cicolini & Rees, 2003). One of the reasons for these differences seems to be the role of the media (Boholm, 1998). In Bulgaria perceived risk increased as papers covered accidents, both local and international, and it was also found that risk communication by the media in three Scandinavian countries shaped risk perception in a different way than in countries like the United States and France (Mullet, Lazreg, Candela & Neto, 2005). Stigma associated with the risk is important in regards to risk perception for environmental risks (Slovic et al., 1991), and this may also have differential effects on everyday RTB in different countries. For example, marrying someone your parents did not approve of has a significant degree of negative stigma in some countries. It is anticipated that there will be significant variation in the avoidance of everyday risks internationally.

3.1.4.2. Gender and RTB.

A second important socio-demographic factor affecting RTB is gender. The general conclusion is that females are more risk averse than males, with some risks having larger gender differences than others (Byrnes, Miller & Schafer, 1999). Females were less risk taking in financial decision making, being less confident, and more likely to attribute performance to good luck (Powell & Ansic, 1997). For environmental risks, particularly technological ones, females perceived the risks to be greater than males did (Rundmo, 2002). This was not in terms of severity of the risk, but that these events were more likely to occur (Hogarth et al., 2007). Men expected greater benefits than women in a number of different domains, including financial, health and safety, recreational, and ethical. However, there was no gender difference in expected benefits for social risks overall, although there were for some individual items in the domain (Harris, Jenkins & Glaser, 2006; Weber et al., 2002). One study also found that the difference only existed in a non-clinical sample, with males and females diagnosed with OCD having similar risk avoidant behaviours (Cicolini & Rees, 2003), and may indicate that gender differences are partially mediated by anxiety.

A number of reasons for the gender differences in RTB have been proposed. It had been suggested that differences in technological risk taking was due to different levels of understanding, but it was found that even with similar levels of understanding of technology the differences remained (Finucane, Slovic, Mertz, Flynn & Satterfield, 2000). In terms of emotions, anger increased risk taking in men, while disgust reduced risk taking in women (Fessler, Pillsworth & Flamson, 2004). One significant gender difference was that women tend to avoid risks even when it is safe, while men take risks, even when it is dangerous, in areas such as physical skills and driving (Byrnes et al., 1999), where there are risks to their personal safety. One theory for the difference between genders in RTB comes from research that has

shown that the differences between the genders are due to a group of white males who are high risk takers. This group of men tend to be in positions of power and therefore have a lot more control over their lives, and this leaves them in a position where they can afford to take risks (Flynn, Slovic & Mertz, 1994). Evidence supporting this theory includes fewer differences where the gender gap is smaller, even between different cultures living in the same country (Olofsson & Rashid, 2011).

In summary, it is expected that in the area of everyday risks, there will be a significant differences in RTB between men and women. Within these groups, a proportion of white males will show high levels of RTB, which will explain most of the difference in scores between males and females. There will also be domain specific differences, with the least difference in social risk taking, and the most in risks involving personal danger.

3.1.4.3. Age and RTB.

A third important socio-demographic variable in explaining differences in RTB is age. Younger people are more risk taking for both gains and losses in simulated gambling tasks (Lauriola & Levin, 2001), although they are also more worried about some risks, such as being in a traffic accident, and environmental risks (Jackson, 2006). Most of the research in this area is on risk perception in adolescents and young adults, and young adults have been found to underestimate risks more than older adults (Johnson et al., 2002). Among late adolescents perceived benefits were better determinants of RTB than are perceived risks (Parsons, Siegel & Cousins, 1997), and the association between risk perception and RTB was stronger than for younger adolescents (Curry & Youngblade, 2006). In a sample of adolescents and young adults, individual perceptions about the magnitude of the personal risk of experiencing negative outcomes was also inversely related to age (Millstein & Halpern-Felsher, 2002).

The primary motivation for risk taking in adolescents appears to be personal gains, with long term costs not considered (Gillen, Guy & Banim, 2004). Similarly, among adolescents who do not engage in risky behaviours, perceived costs were important, whereas perceived benefits were more important for those who do engage in risky behaviours (Siegel et al., 1994). Older adults are more concerned about health and safety, personal wellbeing (Zuckerman, 1984), crime, and violence (Houghton et al, 1999). People aged between 45 and 64 were most concerned about drug use (Jackson, 2006), and there is a general increase in fear of crime as age increases (Farrall & Gadd, 2004), which in elderly people is often related to their experience of physical deterioration (Tulloch, 2000). There has been little research specifically investigating the relationships between age and everyday RTB, but the results of research looking at other types of risk mean there is expected to be a negative correlation between age and RTB in the area of everyday risks. However, it is not expected that this will not be consistent across the

different domains, with older people more likely to avoid risks involving personal danger and risks to personal belongings.

3.1.4.4. Other socio-demographic factors and RTB.

A number of other socio-demographic and personal characteristics have shown a correlation with RTB, and risk perception. Lower risk perception has been associated with better education, higher household income, and being politically more conservative (Flynn et al., 1994). The relationship with education appears to be a difference between people with a university education and the rest of the population (Rundmo, 2002). In terms of occupation, manual workers and engineers have a lower risk rating, and nurses a higher rating (Boholm, 1998), but this research did not control for gender differences, and given the fact that these occupations are among the most gender specific, it is possible this would explain most of the difference between occupations. Also, this research was related to risk perception, and is likely that these variables seem to influence risk taking mostly by changing people's perception of the riskiness and benefit of decision alternatives, rather than by affecting their willingness to take on more or less risk (Weber et al., 2002). It is therefore likely that these differences will be reduced in studying everyday risk behaviours, but that they will remain significant.

A general relationship between socio-demographic variables and risk is that being more vulnerable leads to reduced control, reduced benefit from technology, and higher risk perception (Finucane et al., 2000). The overestimation of risk by people who are unemployed, have lower incomes, are divorced, and live in medium size towns (Boholm, 1998) is partly explained by this relationship. These overestimations were in regards to environmental risks. In studying everyday RTB, responsibilities were linked to reduced risk taking. For men this is often related to financial and employment responsibilities, and in women, having children (Tulloch & Lupton, 2003). It is expected the link between relationships and risk behaviours will occur in everyday RTB. It is less likely that the link with unemployment will remain as strong as two conflicting factors could alter RTB when people are employed, with the added responsibility reducing risk taking, and the increased power increasing risk taking (Finucane et al., 2000). As the actual dangers are low with everyday risks, it is likely that risk taking will be slightly higher amongst employed people, especially those on higher incomes, but this relationship will be reduced where people are married and have children. Also, people who live in small towns will be more risk averse. A final important factor in regards to socio-demographic variables, is that the percentage of difference in RTB accounted for by these factors is not likely to be large (Houghton et al., 1999).

3.1.4.5. Summary of socio-demographic characteristics and RTB.

In summary, a large number of socio-demographic factors are expected to correlate with RTB, with gender being amongst the most consistent. Older people are also likely to avoid risks more, as are those with low income, those who are married, and those with children. Although overall socio-demographic variables are not expected to explain a large percentage of the variability in everyday RTB scores. This area of research advances pervious research by determining which socio-demographic factors are most important in explaining RTB, rather than simply investigating which factors correlate with RTB. For example older people are more likely to have children and be employed, and the impact of age on RTB may explain the apparent relationships of RTB with these socio-demographic characteristics.

3.1.5. Gaps in Existing Research

Although there has been a significant amount of research into the relationship of anxiety and depression with RTB, only a small amount of this research specifically investigates the relationship with everyday RTB. Within these studies everyday RTB has generally been considered a unitary construct, and the domain specific nature of risk avoidant behaviour of people who are anxious and depressed has not been adequately studied. This research adds to existing literature in investigating these domain specific relationships. It also adds to the existing literature by determining if these relationships are linear, or if there are more complex relationships between anxiety, depression and everyday RTB. These could be that moderate levels of depression are associated with risk aversion, and that there are interaction affects of different levels of anxiety and depression on everyday RTB.

Another area of research that has been lacking is in understanding other factors that contribute to RTB, and determining if these factors are important in explaining any observed relationships between everyday RTB and levels of anxiety and depression. For instance, some research has found that gender differences in RTB only exist for non-clinical populations (Cicolini & Rees, 2003), and similar relationships may be found based on other socio-demographic variables, such as age.

This highlights a further gap in existing literature, a majority of research has been conducted on samples that are not representative of the general population such as student samples, and samples that are both highly educated and have high incomes (e.g., Blais & Weber, 2006a). This research therefore also adds to existing literature in using a sample randomly selected from the general population, and investigating the importance of different socio-demographic factors that affect RTB in different domains of everyday risks.

3.1.6. Hypotheses to be Tested

The following hypotheses will be tested. The most important hypotheses are that people who have a level of high anxiety or depression will avoid risks more than those who do not.

1. Relationships between anxiety and everyday RTB.
    a. Anxious people will avoid risks more than non-anxious people.
    b. Anxious people will be less likely to avoid social risks and risks to others than other types of risks.
    c. Anxious people will rate health risks and unknown risks higher than other types of risk.
    d. Anxious people will avoid everyday risks more than depressed people.
2. Relationships between depression and everyday RTB.
    a. People who are depressed will show a higher level of risk aversion than those who are not depressed.
    b. Social risk taking will be lower, and health risk taking higher, in depressed people than other RTB.
    c. Anxiety will mediate the affect of depression on everyday RTB.
    d. The relationship between depression and RTB will not be linear, people with moderate levels of depression will be least risk averse.
3. Socio-demographic factors and everyday RTB.
    a. A group of white males will show a very different risk profile to other groups, being significantly more likely to take risks.
    b. Women will avoid risks more than men.
        i. Women and men will be most similar in avoiding social risks, and most different in risks involving personal danger.
    c. Older people will avoid risks more than younger.
        i. Older people will be most risk averse in risks involving personal danger and risks to belongings.
    d. Being married, having dependent children, low income, no tertiary qualification and living in small towns will make people more risk averse.
    e. Socio-demographic variables will not explain a large percentage of the variation in scores for RTB.
    f. There will be significant differences in everyday RTB between countries.

3.2. Method

The data, method and measures used for this chapter of research were the same as for Chapter 3. Data was analysed using SPSS version 19. Measures used are also the same as for Chapter 3, although scores for the DASS-21 subscales will be analysed based on the level on anxiety, stress and depression, using the cutoff criteria outlined in the DASS manual (Lovibond & Lovibond, 1995). These are scored as level 1 = *normal*, 2 = *mild*, 3 = *moderate*, and 4 = *severe* or *extremely severe*. These are not clinically diagnoses, but guidelines as to the scores that would be expected for someone with those levels of psychological dysfunction (Lovibond & Lovibond, 1995). The overall score on the DASS is a measure of general psychological distress (GSD). Scores on the ERI-E are on a 5 point likert scale with 1 = *I would never do this*, and 5 = *I would definitely do this*. Scores on the total ERI-E scale are from 36-180, and on each domain from 6-30. Lower scores therefore indicate risk aversion, and higher scores are for people who are prepared to take more risks.

There were three samples used for this section of research, New Zealand community and tertiary student samples, and an international internet samples. Further details are provided in section 2.2.1[5].Although a clinical sample would have been preferred, this was not possible to obtain, and given that previous research has shown the relationship between anxiety and RTB to occur in non-clinical samples (Eisenberg et al, 1998) the above samples are suitable for this research. Furthermore, anxiety and depression have high rates in the general population, with 12 month prevalence rates of 14.8% for an anxiety disorder, and 7.9% for a mood disorder (Elisabeth Wells, 2006). Rates are also higher for younger people and women, meaning rates are likely to be significantly higher for the student sample. This indicates these samples are suitable for measuring relationships between anxiety/depression and everyday RTB.

The questionnaires used for the two New Zealand samples are shown in Appendix A, and differences between samples are discussed in Section 2.2.1. The New Zealand community sample questionnaires were distributed by post, with 1000 posted, and 308 returned. The tertiary student sample was collected via distributing questionnaires in lectures, which were then returned in freepost envelopes, with 200 returned of the 503 distributed. Income and population were coded into four categories of increasing *population*/*income* for the New Zealand samples, and population into five categories for the internet sample (income not recorded). The population was scored as 1 for people living in centres with populations of under 5,000, to 5 (for internet sample) for people living in centres of more than 1,000,000 people. *Qualification* is the term used to describe the dichotomous variable of whether people had a tertiary level qualification (code as 1=having qualification, 2=no qualification). *Children* is used to describe whether people had dependent children (1=having children, 2=no children). *Gender* was coded as 1=male and 2=female.

[5] Limitations of not having a clinical sample are discussed in section 5.3.

3.3. Results

The results section will first analyse differences between samples for the key measures used, and calculate descriptive statistics to ensure statistical requirements are met for further analyses. Following this, correlations will be calculated to answer the key hypotheses relating to anxiety and depression, followed by analyses to enable the other hypotheses to be tested. A key aspect of these analyses will be multiple regression equations, to determine which variables explain a unique amount of the variance in everyday RTB. The final part of the results section will be a post-hoc analysis to investigate results that warranted further statistical analysis, and analysis of non-linear effects of anxiety and depression on everyday RTB.

Descriptive statistics for DASS-21 scores are shown for all samples in Table 17, and show that the internet sample is highest on all DASS-21 scores (most likely due to links to the research being posted on forums for people who experience anxiety and depression), and the community sample is the lowest, and these differences are almost all statistically significant. Given the differences between the groups, shown in both Table 1 and Table 17, samples will be analysed separately where this is possible, with the community sample being the main sample analysed due to the larger sample size, and high reliability for the ERI-E domain scores. For some analyses the small numbers in some groups for the individual samples will mean that samples will require combining in order to have sufficient power to detect moderate sized differences in test statistics. Results should also be interpreted taking into account the problems with the internal consistencies for some of the subscales for the internet and student samples.

Descriptive statistics

Statistical assumptions for a number of analyses, including multiple regression and linear correlation, require normal distributions. They also require no outliers, and that scores cover an adequate range of values. Statistical analysis was undertaken for all continuous variables, and

Table 17
Differences between groups on DASS-21 scores.

	Community *n*=308	Internet *n*=141	Student *n*=200		
	M (SD)	*M (SD)*	*M (SD)*	*F*	*p*
Anxiety	5.93 (6.48)	11.49 (10.24)	8.41 (8.75)	23.1	.000[a]
Depression	7.90 (6.68)	13.80 (12.05)	9.23 (9.15)	21.7	.000[b]
Stress	11.05 (7.47)	17.35 (10.04)	13.21 (9.88)	24.4	.000[a]
General Psychological Distress (GSD)	24.88 (18.11)	42.64 (29.17)	30.85 (24.87)	28.7	.000[a]

[a] – all three samples significantly different
[b] – internet sample significantly different to other samples.

the results are shown in Table 18 for the community sample, and Appendix F for student and internet samples. The scores for income are on a 4 point scale, from 1 being under $20,000, and 4 being over $100,000. Similarly population is scored as 1 for people living in centres with less than 5000 people, and 4 for urban areas of over 100,000 people (an additional score of 5 for urban areas over 1,000,000 people was added for the internet sample).

Scores for all measures (for all samples) cover a wide range of scores, for most measures values close to the maximum and minimum possible. For the community and internet samples no values of skewness exceed the commonly used cutoff criteria of 2, and no kurtosis values exceed the cutoff value of 7 (West et al., 1995), indicating all variables are approximately normally distributed. High values of skewness and kurtosis for income and age in the student sample reflect that a majority of students are the same age (18-21), and most have low incomes (under $20,000). Because these two variables have little variance for this population (as well as having high values for skewness and kurtosis) they will not be included in the multiple regression analyses. Statistical requirements are met for other statistical analyses.

3.3.1. Correlational Analysis

Scatterplots of pairs of the critical variables (anxiety, depression and ERI-E scales) were visually analysed to determine relationships were linear before proceeding with correlational analyses. There

Table 18
Descriptive statistics for continuous measures – community sample.

	Minimum	Maximum	*M*	*SD*	Skewness	Kurtosis
Age	18	88	47.90	16.694	.012	-.759
Income	1	4	2.51	1.135	.059	-1.398
Population	1	4	3.03	1.114	-.680	-1.004
Risks to belongings	8	30	18.66	4.998	.209	-.694
Unknown risks	6	28	18.16	4.827	-.002	-.590
Risks involving personal danger	6	30	14.69	4.966	.446	-.358
Risks to others	6	27	11.22	3.543	1.134	2.161
Social risks	8	29	18.52	3.978	.334	-.156
Health risks	6	29	16.80	5.174	.224	-.589
Everyday risks	51	161	98.06	21.843	.331	-.410
GSD	0	96	24.88	18.114	1.658	3.020
Anxiety Level	1	4	1.58	1.011	1.471	.641
Depression Level	1	4	1.49	.861	1.557	1.171
Stress Level	1	4	1.44	.870	1.954	2.661

was no clear evidence of any non-linear relationships between variables. Following this an analysis of the correlations between anxiety, depression and everyday RTB will be undertaken to determine the relationships between these factors. The next step in the data analysis will be to identify important socio-demographic characteristics to take account of in determining relationships between everyday RTB and DASS-21 scales. If significant correlations exist between socio-demographic characteristics and everyday RTB, further analysis will determine the factors which are important in explaining unique variability in everyday RTB scores. This step will also determine whether these factors mediate any relationships between anxiety and depression level and everyday RTB.

3.3.1.1. Anxiety, depression and everyday RTB.

In order to determine the relationship of anxiety and depression with everyday RTB correlations were calculated between these scales, and the results are shown in Table 19, for both anxiety and depression. These results show the relationship between everyday RTB and anxiety is generally weak except for with the community sample, which as hypothesised showed significant correlations between anxiety level and everyday RTB, for three of the six domains.

For the community sample some of the hypotheses related to individual domains were supported. Anxious people were more risk averse for health risks, and less risk averse for social risks and risks to others. It was also hypothesised that they would be more risk averse for unknown risks, and this hypothesis was not supported. Correlations between anxiety and RTB were higher than between depression and RTB, as was hypothesised.

Table 19
Correlations between anxiety, depression and ERI scales for all samples

	Community		Student		Internet	
	Anxiety	Depression	Anxiety	Depression	Anxiety	Depression
Risks to belongings	-.125*	-0.047	-.142*	-.190**	-.026	.022
Unknown risks	-.100	0.053	.002	.015	-.101	-.114
Risks involving personal dangers	-.174**	-0.013	-.012	.009	.013	.029
Risks to others	-.105	-0.012	-.001	-.013	.090	.174*
Social risks	-.099	0.056	-.063	-.002	-.172	-.134
Health risks	-.165**	-0.066	-.092	-.020	-.087	.032
Everyday risks	-.164**	-0.009	-.072	-.047	-.066	-.002

* Significant at 0.05, ** significant at 0.01

Correlations of depression level with everyday RTB showed very weak relationships. Only the correlations with risks to belongings (for the student sample) and risks to others (for the internet sample) reached the required level of significance, and these effects were in opposite directions. None of the hypotheses related to depression and RTB were supported, including the mediation affect of anxiety on the relationship between depression and RTB. Even without taking into account the relationship between anxiety and everyday RTB, depression did not have a significant relationship with RTB, a requirement for mediation to exist (Baron & Kenny, 1986).

Given the weak relationships shown in Table 19, and more significant correlations with socio-demographic factors, multiple regression analysis was performed to enable the unique affects of anxiety and depression to be analysed (in Section 3.3.2). This will also enable hypotheses related to RTB associated with anxiety and depression to be more fully tested (and are highlighted based on the expected relationships for each domain). It is also possible that taking into account socio-demographic factors will highlight significant relationships between anxiety, depression and everyday RTB that are not evident in a simple correlational analysis.

3.3.1.2. Socio-demographic characteristics.

Correlations between socio-demographic variables and the other measures used in this research are shown in Table 20, for the community sample. Variables included are either on a continuous, ordinal, or dichotomous scale. This analysis will also enable many of the hypotheses regarding the links between socio-demographic characteristics and everyday RTB to be tested.

As hypothesised, age had significant correlations with everyday RTB scores. It also had significant correlations with whether people had children or not (older people are more likely to have children), and two DASS-21 scales (GSD and stress level). Older people are less likely to engage in RTB, and have lower levels of stress. Also as hypothesised, income has significant correlations with all of the ERI-E scales, other than social risks, with people on lower income being more risk averse. People on lower incomes also have higher levels of psychological distress, particularly anxiety and depression.

People with tertiary level qualifications were less avoidant of most types of risks (with the exception being risks to belongings), as was hypothesised. The highest correlation was with the everyday risks score, and the highest domain correlations were for unknown risks and social risks. It was hypothesised that people having children would make them risk averse, but this was not supported. The relationships between RTB and having children was not significant in the domains of risks to others, risks involving personal belongings, and social risks, and was

Table 20
Correlations of socio-demographic variables with ERI-E and DASS-21 scales for community sample

	Age	Gender	Qualification	Children	Income	Population
Gender	-.093					
Qualification	.074	-.121*				
Children	.236**	-.100	.003			
Income	.017	-.151**	-.161**	-.263**		
Population	-.084	-.008	-.151**	.054	.096	
Risks to belongings	-.274**	.029	-.107	-.153**	.201**	-.110
Unknown risks	-.379**	.130*	-.173**	-.151**	.153**	.041
Risks involving personal danger	-.381**	-.202**	-.142*	-.037	.202**	.023
Risks to others	-.185**	-.156**	-.114*	-.029	.191**	.015
Social risks	-.402**	-.094	-.156**	.022	.053	.076
Health risks	-.383**	-.067	-.148*	-.113*	.129*	.096
Everyday risks	-.426**	-.069	-.177**	-.104	.196**	.028
GSD	-.069	-.026	-.012	.004	-.178**	-.063
Anxiety level	.069	-.011	.094	.009	-.238**	-.086
Depression level	-.098	-.024	-.064	.051	-.158**	-.024
Stress level	-.133**	.018	.014	-.068	-.099	-.029

* Significant at 0.05, ** significant at 0.01

highest for risks to belongings, people with children worry less about risks to their belongings than people without children.

The relationship between RTB and gender is more complex. Although there is no significant difference in everyday risks, females are more likely to engage in unknown risks, and males are more likely to engage in risks involving personal danger, and those involving risks to others. This does not support the hypothesis that women avoid risks more than men, but did support the hypothesis that there would be gender differences for risks involving personal danger, and no

gender differences for social risks. Population had no significant affect on RTB. The hypothesis that people from smaller urban areas would be more risk averse was not supported.

It was hypothesised that socio-demographic factors would have weaker associations with everyday RTB than anxiety level, and this was not supported, a number of these factors had significantly higher correlations with everyday RTB than with anxiety level. Given the strong relationships of socio-demographic factors with DASS-21 and ERI-E scores, any observed correlations between these scales needs to take account of the moderating affect of these variables on the relationship. For this reason multiple regression analysis, taking into account which variables contribute uniquely to the scores of ERI-E scales will be undertaken, to estimate both the impact of anxiety and depression on RTB, and which socio-demographic variables explain a unique amount of the variability in everyday RTB scores. High correlations between socio-demographic variables may explain some of these relationships for example. This will also enable the unique contribution of other factors, such as anxiety and depression level, to be determined. In other words, if anxiety and depression are important predictors of everyday RTB, after the effects of socio-demographic factors on RTB are taken into account. This will strengthen the evidence from the correlational analysis of the importance of anxiety level in people's everyday RTB.

3.3.2. Multiple Regression Analyses

Multiple regression equations have been calculated for all of the domains of everyday risk taking. All regressions used forward selection, and regression equations were calculated for all samples. Forward selection was chosen as age has the highest correlation with everyday RTB scales, and significant correlations with other socio-demographic variables. By using forward selection the affects of the most important predictor variable (age in most cases, particularly for the community sample), will be taken into account first, and then the variables explaining the remaining variance in scores will be included in the regression equation. Models were included if the variables added were significant at the p=0.05 level, and added at least 1% to the explained variance (r squared value). The r^2 total value is the variance explained by all of the variables in the regression equation. The change in r^2 total in the extra variability explaining by the new item being added into the regression equation. The beta value is a measure of how strongly each predictor variable influences the criterion variable, and is measured in units of standard deviation.

The pool of variables included were anxiety and depression level, and all socio-demographic variables recorded on an interval or dichotomous scale. These were age, gender, tertiary level qualification, children, income, and population. Income was only included in the data collection

for the community sample. Age and income were excluded from the student sample as their values varied very little across the sample (see section 3.3). All of these variables had significant correlations with either ERI-E scores or other socio-demographic variables, and were hypothesised to explain unique variability in everyday RTB scores. Apart from studies investigating RTB based on age and gender, there is no research on the domain effects for a majority of socio-demographic variables used in this research. Therefore only for age and gender were there domain specific hypotheses developed. For other socio-demographic variables the overall everyday risks effects were hypothesised to also apply to individual domains also.

3.3.2.1. Everyday risks.

The multiple regression analyses for the everyday risks score are shown in Table 21. These results will enable the testing of hypotheses related to main affects of anxiety and depression with everyday risk taking, and also determining the most important socio-demographic characteristics. Correlational analysis for the community sample showed that age, qualification, children, income and anxiety level all had significant correlations with the everyday risks score.

No variables were part of the regression equation for more than one of the samples, partly due to age and income being the most important explanatory variables for the community sample, variables which were not included in the analysis for the student sample due to the limited range of these variables in the student population. The internet sample has no variables which explained a significant amount of the variability in everyday risks scores, and the student sample explained less than 3% of the variability, with people from smaller urban centres more likely to be risk averse. The community sample had three variables which together explained 24.4% of the variability in scores, with older people and those on lower incomes being less likely to take risks. Anxiety level and whether people had children or not had significant correlations with the

Table 21

Multiple regression: Analysis of everyday risks score using forward selection

Sample	Variables included	β	*t*	*p*	r^2 total	Change in r^2 total
Community	Age	-.423	-8.222	.000	18.6%	18.6%
	Income	.191	3.679	.000	23.0%	4.4%
	Qualification	-.122	-2.337	.020	24.4%	1.4%
Student	Population	.147	1.999	.047	2.2%	2.2%

everyday risks score, but did not explain a significant amount of the variance in scores once other factors were taken into account. Depression level did not have a significant correlation with everyday risks for the community sample, and also did not explain a significant amount of the variability in the score once the effect of other variables was taken into account. Therefore it indicates that depression is not an important factor in explaining variability in everyday risks.

3.3.2.2. **Unknown risks.**

The multiple regression analyses for the unknown risks scores are shown in Table 22. It was hypothesised that anxious people would be particularly avoidant for unknown risks. Correlational analysis for the community sample showed that age, gender, qualification, children, and income all had significant correlations with the unknown risks score.

Age was the variable that explained the most variance in unknown risk scores (older people less likely to take risks) for the community sample, with other variables adding less than 3% to the r^2 total. Whether people had children or not had a significant correlation with unknown risks for the community sample, but did not explain a significant amount of the variance in scores once other factors were taken into account. The significance of having children in the student sample should be interpreted very cautiously, as only 12 people (6%) in this sample had children. For the internet sample no variables explained a statistically significant amount of the variation in scores. Anxiety level did not have a significant correlation with unknown risks for the community sample, and also did not explain a significant amount of the variability in the score once the effect of other variables was taken into account.

Table 22

Multiple regression: Analysis of unknown risks scores using forward selection

Sample	Variables included	β	*t*	*p*	r^2 total	Change in r^2 total
Community	Age	-.367	-6.921	.000	14.8%	14.8%
	Income	.164	3.015	.003	17.4%	2.6%
	Gender	.120	2.223	.027	19.1%	1.7%
	Qualification	-.108	-2.000	.046	20.2%	1.1%
Student	Children	.175	2.392	.018	3.1%	3.1%

3.3.2.3. **Risks involving personal danger.**

The multiple regression analyses for the risks involving personal danger are shown in Table 23. It was hypothesised that anxious people, women, and older people would be more avoidant of these types of risks. Age, gender, qualification, children, income and anxiety level all had significant correlations with risks involving personal danger for the community sample.

For risks involving personal danger age and gender were the variables that explained the most variance in scores, older people and females were less likely to take risks, as was hypothesised. Gender explained a statistically significant amount of the variance for all samples. The effect of age was as hypothesised for the community sample only, which may be due to internet sample having less variability in age amongst participants (age is not included in the analysis for the student sample). The variance explained by age was less for risks involving personal danger than for the overall ERI-E score. Anxiety level explained a statistically significant amount of the variance in scores for the community samples, but the addition of this into the multiple regression equation only added 1.2% to the amount of explained variability. The socio-demographic variable that had the highest correlation with anxiety level was income (-.238), and the reduction in the level of significance of anxiety on risks involving personal danger in the multiple regression analyses (compared to simple correlational analysis) is primarily due to the inclusion of income in the regression equation. Whether people had a tertiary level qualification, and whether they had children or not, had a significant correlation with risks involving personal danger for the community sample, but did not explain a significant amount of the variance in scores once other factors were taken into account.

Table 23

Multiple regression: Analysis of risks involving personal danger scores using forward selection

Sample	Variables included	β	*t*	*p*	r^2 total	Change in r^2 total
Community	Age	-.410	-7.978	.000	16.0%	16.0%
	Gender	-.195	-3.755	.000	20.8%	4.9%
	Income	.153	2.865	.004	24.0%	3.2%
	Anxiety level	-.115	-2.173	.031	25.2%	1.2%
Internet	Gender	-.265	-3.186	.002	7.0%	7.0%
Student	Gender	-.276	-3.870	.000	7.6%	7.6%

3.3.2.4. **Risks to others.**

The multiple regression analyses for risks to others are shown in Table 24. It was hypothesised that these risks would be avoided less by anxious people than other types of risks. Age, gender, qualification and income all had significant correlations with risks to others for the community sample. Depression level also had a significant correlation with this domain for the internet sample.

For risks to others, age and gender were the most important variables for explaining the difference in scores, with older people (in the community sample) and females being most risk averse. Gender differences were significant for all samples. For students however, the size of the town or city they lived in explained most variance, with people in smaller urban areas being less likely to take risks, and this result was highly significant, so is unlikely to be a type I error. For the community sample people with lower incomes were more likely to be risk averse. Also, for the community sample there were a smaller percentage of variations in scores predicted by the variables included than for most other risk domains.

Qualification had a significant correlation with risks to others for the community sample, but did not explain a significant amount of the variance in scores once other factors were taken into account. Anxiety level did not have a significant correlation with risks to others for the community sample, and also did not explain a significant amount of the variability in the score once the effect of other variables was taken into account. Also, depression had a significant correlation with risks to others for the internet sample, but did not explain a significant amount of the variability in score once the effects of gender were taken into account.

Table 24
Multiple regression: Analysis of risks to others scores using forward selection

Sample	Variables included	β	*t*	*p*	r^2 total	Change in r^2 total
Community	Age	-.210	-3.752	.000	3.8%	3.8%
	Income	.167	2.939	.004	7.6%	3.8%
	Gender	-.160	-2.810	.005	10.0%	2.5%
Internet	Gender	-.212	-2.509	.013	4.5%	4.5%
Student	Population	.222	3.092	.002	4.9%	4.9%
	Gender	-.164	-2.283	.024	7.6%	2.7%

3.3.2.5. **Social risks.**

The multiple regression analyses for social risks are shown in Table 25. It was hypothesised that these risks would have the strongest relationship with depression, and a weaker relationship with anxiety. Gender differences were not expected to occur for this type of risk. Age, qualification, and income all had significant correlations with social risks for the community sample.

For social risks age, was the most important variable for explaining differences in scores for the community sample, with older people being more risk averse. People without a tertiary level qualification and females were also more risk averse, but adding these variables into the multiple regression equation added less than 2% to the amount of variability in scores that was explained by the equation. Gender did not have a significant correlation with social risks for the community sample, but did explain a significant amount of the explained variance (males were more risk taking).

It was hypothesised that there would be no gender differences for social risk taking, and this was the case for two of the samples, so this hypothesis is partially supported. Conversely, income had a significant correlation with risks to others for the community sample, but did not explain a significant amount of the variance in scores once other factors were taken into account. For the student sample the most important variable in explaining difference in scores was population, with people living in smaller urban areas more risk averse. Neither anxiety level nor depression level had significant correlations with social risks for the community sample, and neither explained a significant amount of the variability in the score once the effect of other variables was taken into account.

Table 25
Multiple regression: Analysis of social risks scores using forward selection

Sample	Variables included	β	*t*	*p*	r^2 total	Change in r^2 total
Community	Age	-.412	-7.810	.000	17.2%	17.2%
	Qualification	-.153	-2.885	.004	19.2%	1.9%
	Gender	-.130	-2.452	.015	20.8%	1.7%
Student	Population	.213	2.939	.004	4.6%	4.6%

3.3.2.6. Health risks.

The multiple regression analyses for health risks are shown in Table 26. It was hypothesised that people who are depressed will be less likely to avoid health risks. Age, qualification, children, income, and anxiety level all had significant correlations with health risks for the community sample.

For health risks only the community sample had variables which explained a significant amount of the difference in scores. Age was the most important variable for explaining differences in scores, with older people less likely to take health risks. Other variables contributed less than 3% to the increase in variance explained by the multiple regression equation, with anxiety level and income explaining the next most significant amount of variance. People with higher anxiety levels and lower incomes are less likely to take health risks.

Having a tertiary level qualification and whether people had children did have significant correlations with health risks (see Table 20), but did not explain a significant amount of the variance in scores once other factors were taken into account. The simple correlation of these two variables was just above the 0.05 level of significance, lower than that of the variables with were included in the multiple regression equation. This analysis therefore supports the correlational analysis that the most important variables in explaining variance in health risks are age, anxiety level, and income. Depression level did not have significant correlations with health risks for any of the samples, and did not explain a significant amount of the variability in the health risks score once the effect of other variables was taken into account.

3.3.2.7. Risks to belongings.

The multiple regression analyses for the risk to belongings scores is shown in Table 27. It was hypothesised that older people would be particularly risk averse for this type of risk. Age,

Table 26
Multiple regression: Analysis of health risks scores using forward selection

Sample	Variables included	β	*t*	*p*	r^2 total	Change in r^2 total
Community	Age	-.369	-6.875	.000	14.2%	14.2%
	Anxiety Level	-.120	-2.170	.031	16.3%	2.1%
	Income	.112	2.038	.043	17.5%	1.2%

Table 27
Multiple regression: Analysis of risks to belongings scores using forward selection

Sample	Variables included	β	*t*	*p*	r^2 total	Change in r^2 total
Community	Age	-.291	-5.297	.000	7.4%	7.4%
	Income	.224	4.083	.000	11.8%	4.4%
	Population	-.157	-2.848	.005	14.2%	2.4%
Student	Depression Level	-.194	-2.657	.009	3.8%	3.8%

qualification, children, income, population, and anxiety level all had significant correlations with risks to belongings for the community sample. Depression level also had a significant correlation with this domain for the student sample.

For the internet sample no variable explained a statistically significant amount of the variation in scores. The variables which explained the most unique variance differed between samples. For the community sample, older people and those on lower incomes were less likely to take risks with their belongings, as were people living in larger urban areas. For the student sample people with a higher level of depression were more like to be risk averse. Qualification, children and anxiety level had significant correlations with risks to belongings for the community sample, but did not explain a significant amount of the variance in scores once other factors were taken into account. Although age did explain a significant amount of variability in scores for risks to belongings, the relationship was weaker than for most other domains of RTB, so the hypothesis of older people being particularly risk averse for risks to belongings was not supported.

3.3.3. Analysis of non-linear relationships for anxiety and depression.

The expected relationships between anxiety, depression and everyday RTB did not occur in general for either the multiple regression analysis, or the correlational analysis. Although visual analysis indicated relationships between anxiety, depression and everyday RTB were linear, this is not a reliable method of determining this if there are more complex effects occurring, such as interaction effects. Therefore further analysis was undertaken to determine if there were significant non-linear relationships between these variables.

Of particular interest was determining if people with moderate levels of anxiety or depression differed in their RTB from people with other levels of these factors. If this was the case correlational and multiple regression analysis would not have been able to determine any

differences between these groups. Analysis of any interaction affects was also important, especially given the high co-morbidity of anxiety and depression. This will determine if a particular combination of anxiety and depression levels affect everyday RTB above the effects of either factor alone. ANCOVA analyses will also be conducted to determine if there were both main and interaction affects of anxiety and depression on different domains of everyday RTB. Given the strong relationship between age and RTB evident in the multiple regression analysis, it was used as a covariate in the ANCOVA analysis.

Given the low numbers of participants in some of the anxiety and depression levels for some samples, a combined sample was used in this analysis. A limitation of this approach is that the samples are significantly different (see Table 1), and this should be taken into account in conclusions drawn from this section of research.

3.3.3.1. Two-way ANCOVA analyses for anxiety and depression.

There were no significant main or interaction effects for overall everyday risks, risks to belongings, and risks to others for the combined sample. Only the effects of age were significant.

For unknown risks an ANCOVA of anxiety and depression levels, with age as a covariate, revealed main effects of age, $F(1,625) = 95.03$, $p = .000$, and depression level, $F(3, 625) = 2.82$, $p = .038$. There was no main effect for anxiety level $F(3, 625) = 1.23$, $p = .297$ and no interaction between depression and anxiety level, $F(9, 625) = 1.00$, $p = .435$. The comparison of means for each level of anxiety and depression is shown in Table 28, and the full ANCOVA analysis in Appendix G. The results show that people who have a moderate level of depression are less risk averse than people with severe levels of depression. There is no main effect for anxiety, or any interaction effect.

Table 28
Means (and SD) for each level of anxiety and depression for unknown risks

		Anxiety level				
		normal	mild	moderate	severe	Total
Depression Level	normal	19.42 (4.66)	18.93 (5.88)	19.09 (5.39)	18.18 (6.23)	19.31 (4.88)
	mild	18.75 (4.90)	21.00 (4.96)	18.45 (4.45)	20.11 (4.57)	19.06 (4.74)
	moderate	21.33 (4.61)	20.91 (3.75)	19.72 (4.18)	19.45 (5.31)	20.14 (4.75)
	severe	21.29 (4.15)	14.50 (2.38)	19.68 (5.22)	19.27 (4.24)	19.31 (4.54)
	Total	19.49 (4.69)	19.33 (5.32)	19.20 (4.87)	19.23 (4.95)	19.39 (4.80)

[a]- moderate significantly different than severe at $p = .05$

For risks involving personal danger an ANCOVA of anxiety and depression levels, with age as a covariate, revealed main effects of age, $F(1,625) = 94.30$, $p = .000$, and depression level, $F(3, 625) = 2.99$, $p = .031$. There was no main effect for anxiety level $F(3, 625) = 0.79$, $p = .498$ and no interaction between depression and anxiety level, $F(9, 625) = 1.77$, $p = .072$. The comparison of means for each level of anxiety and depression is shown in Table 29, and the full ANCOVA analysis in Appendix G.

People are more likely to take risks involving personal danger as their level of depression increases from no depression to medium level of depression, but with severe levels of depression they become more risk averse. Although the interaction affect falls just below the p=.05 level of significance, this affect is strongest at low levels of anxiety.

For social risks an ANCOVA of anxiety and depression levels, with age as a covariate, revealed main effects of age, $F(1,625) = 111.29$, $p = .000$, and the interaction between depression and anxiety level, $F(9, 625) = 2.30$, $p = .015$. There was no main effect for anxiety level $F(3, 625) = 2.27$, $p = .0.79$ or depression level, $F(3, 625) = 0.47$, $p = .706$. The comparison of means for each level of anxiety and depression is shown in Table 30, and the full ANCOVA analysis, and graph of relationship, is in Appendix G.

There is no main affect for either depression or anxiety on social risk taking, but there is an interaction effect. Social risk taking is highest when there is a low level of anxiety, and a high level of depression. It is also slightly elevated with a low level of depression and a high level of anxiety. In other words, people are more likely to take social risks when either anxiety or depression is high, but not when both are high. This does not support the hypothesis that social risk taking will be lower with increasing levels of anxiety.

Table 29
Means (and SD) for each level of anxiety and depression for risks involving personal danger

		Anxiety level				
		normal	mild	moderate	severe	Total
Depression Level	normal	15.86 (4.67)	15.07 (5.44)	14.73 (5.42)	15.06 (6.25)	15.67 (4.86)
	mild	15.68 (5.37)	17.50 (6.14)	15.35 (4.10)	18.33 (5.83)	16.09 (5.20)
	moderate	18.52 (5.52)	16.82 (4.45)	16.28 (4.24)	15.16 (5.28)	16.40 (5.14)
	severe	15.86 (4.60)	11.50 (2.65)	17.63 (5.05)	15.64 (4.12)	15.95 (4.49)
	Total	15.98 (4.81)	15.54 (5.30)	15.79 (4.89)	15.61 (5.05)	15.86 (4.90)

a- severe significantly different than mild and moderate at p =.05

Table 30
Means (and SD) for each level of anxiety and depression for social risks

		Anxiety level				
		normal	mild	moderate	severe	Total
Depression Level	normal	19.69 (3.90)	19.00 (4.80)	19.85 (4.10)	20.12 (4.46)	19.67 (4.00)
	mild	19.20 (4.39)	20.75 (5.70)	18.40 (3.62)	20.33 (3.57)	19.29 (4.25)
	moderate	22.38 (3.99)	20.18 (3.76)	18.17 (3.75)	18.82 (4.15)	19.70 (4.24)
	severe	21.86 (2.27)	22.25 (2.06)	21.26 (3.65)	19.42 (4.26)	20.27 (3.97)
	Total	19.82 (3.98)	19.77 (4.60)	19.49 (3.94)	19.39 (4.18)	19.70 (4.06)

For health risks an ANCOVA of anxiety and depression levels, with age as a covariate, revealed main effects of age, $F(1,625) = 76.09$, = .000, and anxiety level, $F(3, 625) = 2.73$, $p = .043$. There was no main effect for depression level, $F(3, 625) = 0.38$, $p = .765$ and no interaction between depression and anxiety level, $F(9, 625) = 1.21$, $p = .286$. The comparison of means for each level of anxiety and depression is shown in Table 31, and the full ANCOVA analysis in Appendix G. Risk taking for health risks is highest at normal anxiety levels, compared to mild and severe levels, but not significantly different to moderate anxiety levels. The inconsistent pattern of results (alternating between high and low as anxiety level increases), and the level of significance being just below the 0.05 level, indicates that it is possible this is a type I error. This would mean that this is an unusual sample, and in the population anxiety has no significant impact on the health risks people are prepared to take.

Table 31
Means (and SD) for each level of anxiety and depression for health risks

		Anxiety level				
		normal	mild	moderate	severe	Total
Depression Level	normal	18.02 (4.84)	16.59 (5.99)	17.45 (4.30)	15.94 (5.24)	17.78 (4.92)
	mild	17.25 (4.97)	18.25 (5.92)	17.10 (5.59)	18.44 (5.34)	17.45 (5.19)
	moderate	21.05 (5.02)	16.18 (3.71)	17.17 (3.81)	16.55 (5.48)	17.70 (5.16)
	severe	18.86 (1.68)	15.50 (4.73)	19.16 (4.90)	17.29 (4.32)	17.81 (4.37)
	Total	18.12 (4.87)	16.67 (5.39)	17.68 (4.64)	16.92 (4.95)	17.73 (4.91)

[a]- normal significantly different than mild and severe at p=.05

3.3.4. Analyses of Categorical Socio-Demographic Variables

A number of the socio-demographic variables are categorical, and one way ANOVA's were calculated to determine their impact on domains of everyday RTB. Different samples were used as appropriate, for example ethnicity was only collected for the student and community samples, and due to the low number in some ethnic categories these samples were combined for this analysis. In all other cases samples were combined due to the low number of participants in some categories for at least one of the samples, in order to have group sizes that had sufficient power to detect medium size differences between groups (Cohen, 1992)

3.3.4.1. Relationship status.

It was hypothesised that people who are married would be more risk averse, so an analysis of the influence of relationship status (married, single or other) on everyday RTB was undertaken. The 'other' category is predominantly participants who are in a relationship, but are not married, although people could have chosen this option for other reasons (e.g. divorced, widowed).

Samples were combined due to the low numbers of participants in some categories for some of the samples. There were significant differences in all domains of everyday RTB for different relationships (married people were more risk averse), and the full results are shown in Appendix H. To determine socio-demographic variables that may influence this hypothesis an ANOVA of differences in these variables for each type of relationship status was undertaken to determine covariates for further statistical analyses. The results show that there were significant differences between relationship types in age, $F(2,499) = 144.11$, $p = .000$, gender, $F(2,641) = 5.77$, $p = .003$, qualification, $F(2,641)=9.55$, $p=.000$, children, $F(2,641)= 80.21$, $p =.000$, income, $F(2,493) =89.25$, $p = .000$, and population, $F(2,629) = 3.14$, $p = .044$. The full results are shown in Appendix H.

There are significant differences between all socio-demographic variables depending on the relationship status. In selecting variables as covariates for further analyses those with the strongest relationship with everyday RTB, and the highest *F* scores for differences for relationship types, were selected, which were age and income. As older people and those on higher income are more likely to be married, and both of these variables also have strong relationship with RTB, eliminating the effect of these variables on differences in RTB for different relationship types will determine the importance of people's relationships on their everyday RTB. As income was only collected for the community and student samples, the internet sample was not included in this analysis. For everyday risk taking an ANCOVA of relationship status, with age and income as covariates, revealed main effects of age, $F(1,486) = 88.43$, $p = .000$, income, $F(1,486) = 23.01$, $p = .000$, and relationship status, $F(2, 486) = 4.57$, $p = .011$. The differences between means for each relationship type are shown in Table 32.

Table 32
Differences in means for each relationship type

(I) relationship	(J) relationship	Mean Difference (I-J)	*SE*	*p*
Single	Married	6.871*	2.399	.004
	Other	.025	2.267	.991
Married	Single	-6.871*	2.399	.004
	Other	-6.845*	2.718	.012
Other	Single	-.025	2.267	.991
	Married	6.845*	2.718	.012

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

Married people are significantly more risk averse than people with other relationship statuses with regard to everyday risk taking even after the factors of age and income are taken into account, as was hypothesised. There was no difference between people who are single and those with other types of relationships, other than being married. The domains where these differences occurred were analysed and the results are shown in Table 33.

The most significant difference in terms of domains was married people being more risk averse for social risks than other groups. Married people are also more risk averse for risks to others, and those involving personal danger. For risks involving personal danger the Other group was not significantly different to the single group in their risk taking. The hypothesised differences between married people and other relationship types only occurs for some types of risks.

Table 33
Differences between estimated marginal means of different relationship status', with age and income as covariates

	Estimated Marginal Means				
	Single	Married	Other	*F*	*p*
Risks to belongings	19.353	18.637	18.916	.848	.429
Unknown risks	19.509	18.980	20.321	2.324	.099
Risks involving personal danger	16.648	15.202	15.955	3.272	.039[a]
Risks to others	11.943	10.791	12.052	4.153	.016[b]
Social risks	20.459	18.361	20.262	10.932	.000[b]
Health risks	18.141	17.211	18.521	2.062	.128

[a] - Single significantly different to Married, at p =.05.
[b] - Married significantly different to other categories at p =.05.

3.3.4.2. Employment status.

It was hypothesised that people who are not working would be more risk averse. To determine if this was the case an analysis of the effect of different types of employment status (not working, full time or part time) on everyday RTB was undertaken. There were significant differences in all domains of everyday RTB for different employment status' (in particular people not working were more risk averse), and the full results are shown in Appendix H. An initial analysis of important socio-demographic differences between participants with different employment status was undertaken to determine covariates for further statistical analyses. The results show that there were significant differences between types of employment status for age, $F(2,635) = 144.11$, $p = .000$, gender, $F(2,638) = 13.25$, $p = .000$, qualification, $F(2,639) = 17.89$, $p = .000$, children, $F(2,639) = 12.93$, $p = .000$, and income, $F(2,490) = 176.28$, $p = .000$, but not for population, $F(2,626) = 1.60$, $p = .187$.

The *F* scores for age and income were higher than for other variables. As these are also variables that have significant relationships with ERI-E scores, they are used as covariates in determining the affect of employment status on everyday risk taking. As income was only collected for the community and student samples, the internet sample was not included in this analysis. For everyday risk taking an ANCOVA of employment status, with age and income as covariates, revealed main effects of age, $F(1,483) = 74.48$, $p = .000$, but not for income, $F(1,483) = 2.04$, $p = .154$, and employment status, $F(2, 483) = 2.37$, $p = .070$. The full ANCOVA analysis is shown in Appendix H. Given the lack of a significant relationship with income further analysis will be undertaken with only age as a covariate. This also means that further analysis will be for all samples, as the exclusion of income as a covariate means the internet sample can be included in the analysis.

Running the analysis with only age as a covariate changed the results considerably. There were main effects of age, $F(1,634) = 26.65$, $p = .000$, and employment status, $F(3, 634) = 5.05$, $p = .002$. The differences between means for each relationship type are shown in Table 34. The hypothesis that people who are not working would be more risk averse than other groups was supported, people who were not working were more risk averse than people of any other employment status, whether or not the effects of age were controlled for. There were no significant differences between any of the other groups, whether people worked full time, part time or students, made no difference to their overall everyday RTB.

An analysis of whether different types of employment was associated with different levels of RTB for only some domains of everyday RTB was undertaken, and the results are shown in Table 35. The groups that are more risk averse differ depending on the domain. People who

Table 34

Differences between estimated marginal means of different employment status', with age as a covariate

(I) employment	(J) employment	Mean Difference (I-J)	*SE*	*p*
Not working	Part Time	-6.458*	2.732	.018
	Full Time	-9.385*	2.426	.000
	Student	-6.159*	2.825	.030
Part Time	Not working	6.458*	2.732	.018
	Full Time	-2.927	2.223	.189
	Student	.299	2.127	.888
Full Time	Not working	9.385*	2.426	.000
	Part Time	2.927	2.223	.189
	Student	3.226	2.238	.150
Student	Not working	6.159*	2.825	.030
	Part Time	-.299	2.127	.888
	Full Time	-3.226	2.238	.150

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

Table 35

Differences between estimated marginal means of different employment status', with age as a covariate

	Estimated Marginal Means					
	Not working	Part Time	Full Time	Student	*F*	*p*
Risks to belongings	17.426	19.516	19.400	18.578	5.058	.002[a]
Unknown risks	17.446	19.993	19.561	19.807	6.326	.000[b]
Risks involving personal danger	15.016	15.411	16.710	15.831	3.765	.011[c]
Risks to others	10.752	11.344	11.718	11.449	1.552	.200[d]
Social risks	19.041	19.458	20.123	19.885	2.123	.096[d]
Health risks	17.112	17.529	18.666	17.402	3.042	.017[e]

[a] – Not working significantly different to full time and part time, at p=.05.

[b] – Not working significantly different to other groups, at p=.05.

[c] - Full time significantly different to not working and part time, at p=.05.

[d] - Not working significantly different to full time, at p=.05.

[e] - Full time significantly different to other groups, at p=.05.

are not working are more averse for risks to belongings and unknown risks than most other groups. For risks involving personal danger and health risks the significant differences are between the full time group and other groups, with full time workers being more likely to take risks. This partially supports the hypothesis that people not working will be risk averse, but only for some types of risks. There are significant differences between people not working and those working full time for all RTB domains, people not working being more risk averse.

3.3.4.3. Nationality differences.

It was hypothesised that there would be significant differences in everyday RTB, between countries (Boholm, 1998; Cicolini & Rees et al, 2003). To test this hypothesis the analysis will determine whether there are differences in RTB for any of the everyday RTB scales on the basis of nationality. Only the United States (105 participants) and New Zealand (508 participants) have sufficient numbers to conduct a comparison between countries.

As these samples were collected using different methods a comparison of group differences was conducted first, to identify any important covariates. The results show that there were significant differences between nationalities in age, $F(1,608) = 126.64$, $p = .000$, and gender, $F(1,612) = 2.63$, $p = .001$, but not for qualification, $F(1,611) = 2.35$, $p = .126$, children, $F(1,611) = 0.02$, $p = .889$, and population, $F(1,599) = 2.57$, $p = .110$. The full results are shown in Appendix H. New Zealand participants were older than United States participants by approximately 11 years (means of 38.8 and 27.9), and there was a higher percentage of males in the New Zealand participants, with 40% compared to 22% for the United States.

Results in Table 20 show that both of the variables which were significantly different between United States and New Zealand participants (age and gender) are important predictors of at least some domains of everyday RTB, so have been used as covariates in the ANCOVA. For everyday risk taking an ANCOVA of nationality, with age and gender as covariates, revealed main effects of age, $F(1,605) = 132.04$, $p = .000$, gender, $F(1,605)=10.72$, $p=.001$, and nationality, $F(1, 605) = 9.31$, $p = .002$. The means for the everyday risks scale of United States participants was 97.6 once the effects of age and gender were controlled for (101.00 without controlling for these factors), and for New Zealand participants was 104.0 once these effects were taken into account (103.32 otherwise). The full ANCOVA analysis is shown in Appendix H.

These results show that people from the United States are more risk averse than people from New Zealand for everyday risk taking. This supports the hypothesis that there would be differences in everyday RTB scores between countries. A further analysis was undertaken to show the specific domains in which the two countries differed and the results are shown in Table 36.

Table 36
Differences between estimated marginal means of New Zealand and United States participants, age and gender as covariates

	Estimated Marginal Means				
	New Zealand	United States	Mean Difference	*F*	*p*
Risks to belongings	19.108	17.652	1.456	8.007	0.005
Unknown risks	19.644	18.299	1.345	7.711	0.006
Risks involving personal danger	16.003	15.073	.929	3.679	.056
Risks to others	11.526	10.303	1.223	10.999	.001
Social risks	19.745	19.549	.196	.237	.627
Health risks	17.990	16.771	1.220	5.718	.017

These results show that for all domains the New Zealand sample was less risk averse, but for only some domains were the differences statistically significant. Those domains with the most significant differences were for risks to belongings, risks to others, and unknown risks. There was no difference in the levels of social risk taking, and risks involving personal danger fell just below the 0.05 level of significance. As four of the six domains show differences between nationalities, this adds further support to the hypothesis of differences between countries in everyday RTB.

3.3.4.4. Are White Males more risk taking?

It was hypothesised that the differences in RTB between males and females would be due to a group of white males who are higher in RTB. To determine if this is the case an analysis of the influence of ethnicity and gender on RTB was undertaken. As ethnicity was not collected for the internet sample, this is not included in the analysis, but the other two samples (community and student) were combined so sufficient numbers were included for each ethnic group to detect moderate sized differences between groups. Ethnicities used in the analysis were Maori, NZ European/Pakeha and Other. The ‘Other’ group consists predominantly of Pacific Islanders and Asians.

An initial analysis of important socio-demographic differences between different ethnic groups was undertaken to determine covariates for further statistical analyses. The results show that there were significant differences between ethnicities in age, $F(2,499) = 10.16$, $p = .000$, and income, $F(2,493) = 3.84$, $p = .022$, but not for gender, $F(2,504) = 0.59$, $p = .554$, qualification,

$F(2,502) = 0.49$, $p = .610$, children, $F(2,502) = 1.34$, $p = .262$, and population, $F(2,491) = 2.32$, $p = .100$. The full results are shown in Appendix H.

Significant differences between ethnic groups were for age and income, and as both of these variables were important in explaining differences in RTB they were used as covariates in analyses involving ethnicity. To test the hypothesis that a difference in risk taking scores was due to white males showing a different profile to other groups an ANCOVA analysis was conducted on gender and ethnicity with age and income as covariates .The results revealed main effects of age, $F(1,483) = 184.47$, $p = .000$, income, $F(1,483) = 13.10$, $p = .000$, and ethnicity, $F(2, 483) = 24.78$, $p = .000$, but not for gender, $F(1,483) = 3.32$, $p=.069$, and there was no interaction effect between gender and ethnicity, $F(2,483) = .090$, $p=.914$. The full ANCOVA analysis is shown in Appendix H. These results do not support the hypothesis that differences in RTB between ethnicities are due to a group of white males who are high risk takers.

An analysis of differences in means for different ethnicities is shown in Table 37, for the combined sample (combination of student and community samples), with age and income as covariates. The *Other* group is significantly more risk averse for everyday risk taking than the NZ European and Maori groups. The domains where these differences occurred were analysed and the results are shown in Table 38.

The domains showed a consistent pattern of differences in risk taking for the three ethnicity groups, the Other group was significantly more risk averse than the NZ European and Maori groups, which did not differ from each other. The biggest differences occurred in risks to belongings and health risks, but all domains had highly significant differences. One difference between the Other group and the rest of the participants is that it is far more likely that those in the Other group were not born in New Zealand.

Table 37
Differences between estimated marginal means of different ethnic groups for overall ERI-E score – with age and income as covariates

(I) Ethnicity	(J) Ethnicity	Mean Difference (I-J)	*SE*	*p*
NZ European	Maori	-4.268	3.324	.200
	Other	17.649	2.667	.000
Maori	NZ European	4.268	3.324	.200
	Other	21.917	4.035	.000
Other	NZ European	-17.649	2.667	.000
	Maori	-21.917	4.035	.000

Table 38
Differences between estimated marginal means of different ethnic groups, with age and income as covariates

	Estimated Marginal Means				
	NZ European	Maori	Other	*F*	*p*
Risks to belongings	19.362	20.563	15.205	23.431	.000[a]
Unknown risks	19.892	19.056	16.360	15.808	.000[a]
Risks involving personal danger	16.176	17.562	13.486	10.731	.000[a]
Risks to others	11.663	12.375	10.063	6.149	.002[a]
Social risks	19.766	20.890	17.985	7.624	.001[a]
Health risks	18.235	18.916	14.346	18.740	.000[a]

[a] - Other significantly different to NZ Maori and European at p=.05.

3.3.5. Post Hoc Analysis - Sample Subgroups

Given the strong relationships of age and gender to everyday RTB shown in earlier results from this chapter (see Table 20), for both everyday risks and separate domains, an analysis was done splitting the samples on the basis of these two variables. This is to investigate the possibility that important factors in explaining differences in RTB, including anxiety and depression level, may differ between genders, and between different age groups. Samples were combined in order to have sufficient numbers in each group. Because income was included in the multiple regression analysis, which was not collected for the internet sample, the analysis is on the combined student and New Zealand community samples. Given the strong relationship between income and everyday RTB, not including it in the regression analysis in order to be able to include the internet sample was not considered suitable.

3.3.5.1. Regression analysis by gender.

Splitting the sample into genders meant a female sample size of 416, and a male sample size of 229.

3.3.5.1.1. Everyday RTB.

The results of the multiple regression analysis for everyday risk taking are shown in Table 39. Variables included in the analysis were age, qualification, children, income, population, anxiety level, and depression level.

Table 39
Multiple regression: Analysis of everyday risk taking by gender, using forward selection

Sample	Variables included	β	*t*	*p*	r^2 total	Change in r^2 total
Male	Age	-.614	-9.636	.000	26.9%	26.9%
	Income	.255	3.436	.001	30.3%	3.4%
	Qualification	-.141	-2.309	.022	32.2%	1.9%
	Children	.143	2.038	.043	33.7%	1.5%
Female	Age	-.456	-8.232	.000	18.3%	18.3%
	Qualification	-.111	-2.003	.046	19.5%	1.2%

Age was by far the most important predictor variable for everyday risk taking in both genders, with older people more risk averse. Aside from age only income for the male sample added more than 2% to the explained variability in everyday RTB scores for the multiples regression equation, with lower income predicting people being risk averse. These variables explained more of the variance in scores for males than females.

3.3.5.1.2. Risks to belongings.

The results of the multiple regression equation for risks to belongings are shown Table 40. Age was the most important predictor variable for risks to belongings scores for both males and females, with older people being more risk averse. For males a higher level of depression, lower income and having dependent children all predicted people being risk averse. For females risk aversion was significantly associated with having lower income, and being from smaller urban areas. These variables explained significantly more of the variance in scores for males than females.

3.3.5.1.3. Unknown risks.

The results of the multiple regression equation for unknown risks are shown in Table 41. Age was by far the most important predictor variable for unknown risks, older people being less likely to take these risks. Aside from age only lower income and living in smaller urban areas explained risk aversion for unknown risks. These variables explained significantly more of the variance in scores for males than females.

Table 40

Multiple regression: Analysis of risks to belongings by gender, using forward selection

Sample	Variables included	β	*t*	*p*	r^2 total	Change in r^2 total
Male	Age	-.366	-5.136	.000	6.6%	6.6%
	Depression Level	-.213	-3.116	.002	11.7%	5.1%
	Income	.282	3.410	.001	15.1%	3.4%
	Children	.156	1.986	.048	16.9%	1.8%
Female	Age	-.320	-4.907	.000	4.3%	4.3%
	Income	.191	2.847	.005	7.5%	3.2%
	Population	-.136	-2.360	.019	9.2%	1.7%
	Anxiety Level	-.134	-2.300	.022	10.9%	1.7%

3.3.5.1.4. Risks involving personal danger.

The results of the multiple regression equation for risks involving personal danger are shown in Table 42. Age was by far the most important predictor variable for risks involving personal danger, older people being less likely to take these risks. Aside from age only lower income (for both samples), and males having dependent children explained risk aversion for risks involving personal danger. These variables explained significantly more of the variance in scores for males than females.

Table 41

Multiple regression: Analysis of unknown risks by gender, using forward selection

Sample	Variables included	β	*t*	*p*	r^2 total	Change in r^2 total
Male	Age	-.556	-8.674	.000	26.0%	26.0%
	Income	.172	2.689	.008	28.6%	2.6%
	Population	.141	2.321	.021	30.6%	2.0%
Female	Age	-.350	-6.259	.000	12.2%	12.2%

Table 42
Multiple regression: Analysis of risks involving personal danger risk by gender, using forward selection

Sample	Variables included	β	*t*	*p*	r^2 total	Change in r^2 total
Male	Age	-.572	-8.813	.000	26.1%	26.1%
	Income	.226	2.997	.003	27.7%	1.6%
	Children	.171	2.383	.018	29.8%	2.1%
Female	Age	-.494	-8.103	.000	18.2%	18.2%
	Income	.140	2.292	.023	19.7%	1.5%

3.3.5.1.5. Risks to others.

The results of the multiple regression equation for risks to others are shown in Table 43. Age was by far the most important predictor variable for risks to others, older people being less likely to take these risks. Aside from age only males with lower income and males from smaller urban areas predicted risk aversion for risks to others. These variables explained significantly more of the variance in scores for males than females, but a lower percentage overall than for other domains of RTB.

3.3.5.1.6. Social risks.

The results of the multiple regression equation for social risks are shown in Table 44. Age was by far the most important variable in explaining variance in social risk taking scores, older people being less likely to take these risks. Aside from age only males with from smaller urban areas, and males with no tertiary qualification, predicted risk aversion to social risk taking. These variables explained significantly more of the variance in scores for males than females.

Table 43
Multiple regression: Analysis of risks to others by gender, using forward selection

Sample	Variables included	β	*t*	*p*	r^2 total	Change in r^2 total
Male	Age	-.314	-4.369	.000	6.9%	6.9%
	Income	.192	2.676	.008	10.1%	3.2%
	Population	.170	2.489	.014	13.0%	2.9%
Female	Age	-.190	-3.248	.001	3.6%	3.6%

Table 44
Multiple regression: Analysis of social risk taking by gender, using forward selection

Sample	Variables included	β	*t*	*p*	r^2 total	Change in r^2 total
Male	Age	-.531	-8.820	.000	26.3%	26.3%
	Population	.198	3.279	.001	31.6%	5.3%
	Qualification	-.174	-2.850	.005	34.4%	2.8%
Female	Age	-.420	-7.753	.000	17.6%	17.6%

3.3.5.1.7. Health risks.

The results of the multiple regression equation for health risks are shown in Table 45. Age was by far the most important variable in explaining variance in health risk taking scores, older people being less likely to take these risks. Aside from age, only males with higher depression level, and males with no tertiary qualification predicted risk aversion for health risks, both variables adding less than 3% to the explained variability of the multiple regression equation. Similar amount of total variance in these scores were explained by the models for males and females.

3.3.5.2. Regression analysis by age.

Age has the highest correlations with RTB, so a post-hoc analysis was run to determine if there are significant differences variables which explain RTB in older and younger participants. Of particular interest was whether anxiety and depression level explained unique variability in RTB scores in some age groups but not others. To enable the sample to be split into two groups of approximately equal size, the younger group was determined to be those aged under 40, and the older group those aged over 40. Variables included in the analysis were gender, qualification,

Table 45
Multiple regression: Analysis of health risks taking by gender, using forward selection

Sample	Variables included	β	*t*	*p*	r^2 total	Change in r^2 total
Male	Age	-.424	-6.296	.000	14.1%	14.1%
	Depression Level	-.177	-2.649	.009	16.8%	2.7%
	Qualification	-.141	-2.114	.036	18.8%	2.0%
Female	Age	-.415	-7.651	.000	17.2%	17.2%

children, income, population, anxiety level, and depression level. As income was included in the multiple regression analyses, the results are for the combined community and tertiary student samples.

3.3.5.2.1. Everyday Risks.

The results of the multiple regression analysis for everyday RTB is shown in Table 46. Whether people had children was the most important predictor variable for everyday RTB, but for younger people having children made them more risk averse, whereas for older people having children made them more likely to engage in everyday RTB. For older adults having a tertiary level qualification, and being anxious, but not depressed, made them more likely to take risks. For younger people, females were less likely to take risks. Overall, these variables explained less than 20% of the variability in scores for older adults, and less than 10% for the younger sample.

3.3.5.2.2. Risks to belongings.

The results of the multiple regression equation for risks to belongings are shown in Table 47. Whether people had children was the most important predictor variable for risks to belongings, but for younger people having children made them more risk averse, whereas for older people having children made them more likely to engage in risks to belongings. For older adults having a tertiary level qualification, being anxious, and being from a smaller urban area made them more likely to take risks. For younger people, lower income and having lower levels of depression contributed significantly to being more risk taking for risks to belongings. Overall, these variables explained less than 20% of the variability in scores for older adults, and less than 10% for the younger sample.

Table 46
Multiple regression: Analysis of everyday risk taking by age, using forward selection

Sample	Variables included	β	*t*	*p*	r^2 total	Change in r^2 total
Younger	Children	.269	4.546	.000	6.9%	6.9%
	Gender	-.146	-2.471	.014	9.0%	2.1%
Older	Children	-.314	-4.987	.000	8.2%	8.2%
	Qualification	-.180	-2.807	.005	13.3%	5.1%
	Anxiety level	-.281	-3.696	.000	17.1%	3.8%
	Depression level	.151	2.004	.046	18.6%	1.6%

Table 47

Multiple regression: Analysis of risks to belongings by age, using forward selection

Sample	Variables included	β	*t*	*p*	r^2 total	Change in r^2 total
Younger	Children	.250	3.552	.000	2.1%	2.1%
	Income	.173	2.462	.014	4.3%	2.2%
	Depression Level	-.148	-2.446	.015	6.5%	2.2%
Older	Children	-.307	-4.843	.000	8.5%	8.5%
	Anxiety Level	-.194	-3.031	.003	12.2%	3.8%
	Population	-.193	-2.996	.003	14.8%	2.6%
	Qualification	-.183	-2.814	.005	17.9%	3.1%

3.3.5.2.3. Unknown risks.

The results of the multiple regression equation for unknown risks are shown in Table 48. Whether people had children was the most important predictor variable for unknown risks, but for younger people having children was associated with being risk averse, whereas for older people having children made them more likely to engage in these risks. For older adults having a tertiary level qualification, being male, and having a higher income made them more likely to take unknown risks. Overall these variables explained less than 20% of the variability in scores for older adults, and less than 5% for the younger sample.

3.3.5.2.4. Risks involving personal danger.

The results of the multiple regression equation for risks involving personal danger are shown in Table 49. The most important predictor variable for risks involving personal danger, differed

Table 48

Multiple regression: Analysis of unknown risks by age, using forward selection

Sample	Variables included	β	*t*	*p*	r^2 total	Change in r^2 total
Younger	Children	.175	2.866	.005	3.1%	3.1%
Older	Children	-.210	-3.200	.002	5.7%	5.7%
	Qualification	-.182	-2.792	.006	11.0%	5.3%
	Gender	.205	3.188	.002	14.1%	3.2%
	Income	.182	2.725	.007	17.1%	3.0%

Table 49
Multiple regression: Analysis of risks involving personal danger risk by age, using forward selection

Sample	Variables included	β	*t*	*p*	r^2 total	Change in r^2 total
Younger	Gender	-.295	-5.184	.000	8.0%	8.0%
	Children	.282	4.952	.000	15.9%	7.9%
Older	Income	.149	2.148	.033	8.8%	8.8%
	Children	-.239	-3.680	.000	12.2%	3.4%
	Anxiety Level	-.262	-3.352	.001	14.4%	2.3%
	Depression Level	.191	2.567	.011	17.5%	3.0%
	Gender	-.158	-2.509	.013	19.6%	2.1%
	Qualification	-.133	-2.054	.041	21.2%	1.6%

depending on the age of participants. Having children and being female made younger people less likely to take these types of risks. For older adults having a higher income, being anxious, not being depressed, being female, and having a tertiary level qualification made them more likely to take risks. Overall these variables explained less than 25% of the variability in scores for older adults, and less than 20% for the younger sample.

3.3.5.2.5. Risks to others.

The results of the multiple regression equation for risks to others are shown in Table 50. The most important predictor variable for risks to others, differed depending on the age of participants. For younger people, being from smaller urban areas, having a tertiary level qualification, having children and being female made them less likely to take these types of risks. For older adults having a lower income, being female, and having dependent children made them more likely to take risks. Overall these variables explained less than 10% of the variability in scores for older adults, and less than 15% for the younger sample.

3.3.5.2.6. Social risks.

The results of the multiple regression equation for social risks are shown in Table 51. For the younger sample not having dependent children, being from larger urban areas, and having low levels of anxiety made them more likely to take social risks. For the older sample having a tertiary level qualification and having dependent children made them more likely to take social risks. Overall these variables explained less than 10% of the variability in scores for both groups.

Table 50
Multiple regression: Analysis of risks to others by age, using forward selection

Sample	Variables included	β	*t*	*p*	r^2 total	Change in r^2 total
Younger	Population	.191	3.308	.001	4.7%	4.7%
	Qualification	-.240	-3.890	.000	7.2%	2.4%
	Children	.248	4.020	.000	12.2%	5.1%
	Gender	-.160	-2.767	.006	14.8%	2.5%
Older	Income	.120	1.737	.084	2.9%	2.9%
	Gender	-.159	-2.361	.019	5.2%	2.2%
	Children	-.141	-2.054	.041	7.1%	1.9%

3.3.5.2.7. Health risks.

The results of the multiple regression equation for health risks are shown in Table 52. For the younger sample not having dependent children made people more likely to take health risks. For the older sample having a low level of anxiety, having dependent children, and having a tertiary level qualification made them more likely to take these types of risks. Overall these variables explained less than 5% of the variability in scores for the younger age group, and less than 20% of the variability for the older age group.

Table 51
Multiple regression: Analysis of social risks by age, using forward selection

Sample	Variables included	β	*t*	*p*	r^2 total	Change in r^2 total
Younger	Children	.230	3.854	.000	4.9%	4.9%
	Population	.145	2.446	.015	6.9%	1.9%
	Anxiety Level	-.143	-2.395	.017	8.9%	2.0%
Older	Qualification	-.254	-3.826	.000	5.6%	5.6%
	Children	-.174	-2.617	.010	8.6%	3.0%

Table 52
Multiple regression: Analysis of health risks by age, using forward selection

Sample	Variables included	β	*t*	*p*	r^2 total	Change in r^2 total
Younger	Children	.205	3.379	.001	4.2%	4.2%
Older	Anxiety Level	-.256	-3.993	.000	7.2%	7.2%
	Children	-.276	-4.336	.000	14.0%	6.8%
	Qualification	-.163	-2.541	.012	16.6%	2.6%

3.4. Discussion

The hypotheses tested were organised into thematic sections (Section 3.1.6) and these will be discussed in the order they were originally presented.

3.4.1. Anxiety and Everyday Risk Taking

3.4.1.1. Overall RTB.

The hypothesis that people who are anxious are risk averse received limited support. Results in Table 19 show that anxiety level has a significant negative correlation with everyday risks (total score of the ERI-E), but only for the community sample. Given the correlations between socio-demographic variables and everyday RTB, multiple regression analyses were undertaken, which showed that anxiety level was not a significant predictor of everyday risks once the effects of these other variables was taken into account. This was primarily due to people on low incomes being both risk averse and anxious. Income is a better predictor of RTB than anxiety level, with everyday RTB having a higher correlation with income (.216) than anxiety level (-.164). Once the affects of income were taken into account anxiety level did not explain a significant amount of the variance in the overall everyday RTB score. In other words, knowing a person's income level enables us to predict their level of RTB more than knowing their level of anxiety does. Reasons for the importance of income on RTB are discussed in section 3.4.3. This advances research in investigating the impact of other variables on the anxiety – RTB relationship.

To investigate the possibility that the relationship between anxiety and everyday risks was not linear an ANCOVA with age as a covariate was undertaken, but this showed that everyday risk scores did not differ based on the level of anxiety (Section 3.3.3.1). In summary, although anxiety level does have a significant relationship with everyday risks this was for only one sample (community sample), and it is not an important predictor of risk aversion for everyday

risks when other factors are taken into account. Given these results the hypothesis from the research of Eisenberg et al. (1998), and Maner et al. (1997) that anxious people are risk averse is only partially supported.

Further analysis of previous research indicates that the observed correlations between RTB and measures of anxiety are typically 0.2 for general population samples (Maner & Schmidt, 1997, Hockey et al, 2000), similar to results for the community sample in the present research. This means that large sample sizes are required to achieve statistical significance. In contrast using clinical samples of OCD patients, even small samples showed significant differences between the groups (Rees et al., 2005; Steketee & Frost, 1994). These results of this study indicate that anxiety is a weak predictor of risk aversion, and small differences in research factors are likely to lead to different conclusions about whether the relationship is significant. These differences could include different participants, sample sizes, and the methods of measuring both RTB and anxiety. For this research the correlations were in the expected direction for each sample (anxious people were more risk averse), but this only reached the level of statistical significance for the community sample (Table 19). There is therefore some support for anxiety being a weak predictor of everyday RTB.

The hypothesis that anxiety is a stronger predictor of risk aversion than depression was partially supported. Results in Table 19 show that anxiety level has a higher correlation with everyday risks than depression level for all samples, showing a consistent pattern even for results which were not statistically significant. These results support previous research than has investigated these differences (e.g. Hockey et al, 2000), however the weakness of the relationship between anxiety and RTB means this conclusion should be treated with some caution.

3.4.1.2. Domain specific RTB.

Results show that there is some domain specificity in the relationship between RTB and anxiety, correlations in Table 19 indicate that some domains have stronger relationships with anxiety than other domains. The domains with the strongest relationship with anxiety are risks to belongings, health risks, and risks involving personal danger. This partially supports the hypotheses that predicted anxious people would be more risk averse in some domains of RTB. There is support for the hypothesis of risk aversion for health risks (Butler & Mathews, 1983), but not for the hypothesis of risk aversion for unknown risks, developed from the research investigating intolerance of uncertainty (IU) (Dugas et al, 1997). It does support the hypothesis based on the results of Stober (1997) which predicts anxious people being less likely to avoid risks to others. These results advance research in this area by specifically investigating domain specific RTB suggested by other research, and finding some support for the relationships this research indicated should be present.

Multiple regression equations were used to determine which variables explained a significant amount of the unique variance in everyday RTB domains. Results of this analysis generally supported the findings of the correlational analyses in regards to the importance of anxiety level in some domains. For two of the three domains that had significant correlations for anxiety level (for the community sample), anxiety level also explained a significant amount of the variability in scores once the effects of socio-demographic variables was taken into account. For both risks involving personal danger and health risks anxiety level plays a significant role in predicting people's RTB. Furthermore, although there is some variability in the types of risks avoided by anxious people, all correlations were negative, and of similar magnitude, so this does not in general support the hypotheses of Butler and Mathews (1983) that anxious people will show more variation in the types of risk they will avoid.

Analysis dichotomising the participants on the basis of age did show that the relationship between anxiety and everyday RTB was stronger for older people than younger people. In people aged over 40 anxiety level explained a significant amount of the variability in overall everyday risks score, as well as for three of the six domains. In particular, for health risks anxiety level was the most important explanatory variable, accounting for 7.2% of the unique variability in scores, anxious people were more risk averse. For the younger age group the only variable for which anxiety level explained a significant amount in variability was 2% for social risks. Anxiety level is therefore a significantly more important predictor of risk taking in older adults (over the age of 40) than younger adults in this study. Given the domain in which anxiety has the largest impact is health risks, it may be that people with health concerns are both anxious, and avoidant of risks to their health. It may also simply reflect the presence of items on the anxiety scale of the DASS-21 measuring physical symptoms, which in this population are simply results of their health conditions rather than symptoms of anxiety.

The general conclusion in regards to anxiety and everyday risk taking is that although anxious people are more risk aversive, the relationships are weak, and only occur for older adults (aged over 40). Socio-demographic factors play a significantly more important role, and anxiety has a weak association with everyday risk taking scores once the effect of these factors is taken into account. This is the case for overall everyday risks, as well as for each domain. There is some variability in the domains of everyday risk taking that anxious people avoid (see Table 19), but it is likely that this is more due to chance variability than any population differences. This is because no domain has a consistent pattern of significant scores for different samples, and comparing the correlations of each of the domains with anxiety level, the results are relatively consistent for each sample. The main exception to this general conclusion is that older people

who are anxious are significantly more likely to avoid health risks (see previous paragraph for possible explanation for this result).

This research advances knowledge in this area in specifying the domain specific relationships between anxiety and everyday RTB. It also identifies specific features of this relationship for older adults that do not exist for younger adults, especially in the area of health risks.

3.4.2. Depression and Everyday Risk Taking

The hypothesis that people who are depressed are risk averse was not supported, contrasting the finding of Boholm (1998), Pietromonaco and Rook (1987) and other researchers. Results in Table 19 show that there were few significant relationships between depression and measures of everyday risk taking. Of the 21 correlations calculated, only two were statistically significant, and these were for different domains and different samples, and were in opposite directions. This indicates that it is likely that these results reflect the results being type I errors. Depression did not have a significant correlation with health risks for any of the samples, and only for the internet sample was the direction of the correlation in the direction predicted by Vollrath and Torgesen (2002).

Given the correlations between socio-demographic variables and everyday RTB, multiple regression analyses were undertaken to determine if there were relationships between depression and RTB that were hidden by relationships between socio-demographic factors and RTB, which also correlated with depression level. The results of these analyses supported the simple correlations; depression level was not a significant predictor of everyday RTB, for either overall everyday risks, or individual domains. Depression did explain a significant amount of the variability in scores for some domains (risks to belongings and risks to others) when the sample was split into younger and older subgroups, but this is likely to reflect type I errors. The values were only significant at the .05 level (were greater than .01), occurred across different domains, for different age groups, and both high and low depression levels were associated with risk aversion.

There were two significant finding for males however, depression was linked to risk aversion for risks to belongings and health risks, and both results were highly significant (<.01). Another noteworthy fact of the multiple regression equation for risks to belongings (for males) is that the percentage of variance explained by income was higher for this domain than other domains. This may reflect that males who are depressed have lower incomes (see Table 20), and as depression leads to lower incomes it is particularly important for this group to protect their belongings. Items that worry men appear largely to reflect their role as traditional ‘breadwinners’ (Houghton et al., 1999), and this may be why this relationship is only important

for males. The significant result for health risks is difficult to interpret, and although the result was highly significant, may still be a type I error.

To investigate the possibility that the relationship between depression and everyday RTB was not linear an ANCOVA with age as a covariate was undertaken, which showed that depression level did have a non-linear relationship with some domains of the ERI-E, for unknown risks (Table 28) and risks involving personal danger (Table 29), people with a moderate level of depression were more risk averse. This was the opposite of that predicted by previous research (Isen & Geva, 1987), but is indicative of depressed people being risk averse up to a certain level of depression after which they do not care anymore. Severe levels of depression are associated with suicidal thoughts so it is not surprising that at high levels of depression people are not as concerned about taking risks as they are at moderate levels. In summary, depression level is not an important predictor of risk aversion for everyday risks, but there is some evidence that people with a moderate level of depression are more risk averse than people with either a high or low level of depression, for some types of risks. The non-linear affects of depression on RTB advance research in the affects of depression on RTB.

Stober (1997) showed that anxiety mediated the affect of depression on everyday RTB. Given the non-existent relationship between depression and everyday RTB (in both correlational and multiple regression analyses) there can be no mediation effects. Non-linear affects were also investigated using ANCOVA, and there was a significant interaction effect for social risk taking (Table 30). Although the level of significance is not high, and the observed trends are complex, social risk taking is highest when there is either a high level of depression or anxiety, but not when there are both. This does not support the social risk hypothesis for depression (Allen and Badcock, 2003), which predicts social risk taking will be lower when people are depressed.

3.4.3. Socio-Demographic Factors and Everyday Risk Taking

All socio-demographic factors included in the statistical analysis had significant correlations with at least one of the everyday risk taking scales. Due to the high number of significant correlations between socio-demographic variables, a majority of the analysis in this chapter will be based on the multiple regression analysis, determining which factors explain a unique amount of variance in everyday risk taking scores (see section 3.3.1.1 for a discussion of the rationale for this approach). It was hypothesised that socio-demographic variables would not explain a large percentage of variation in everyday risk taking scores, but this hypothesis was not supported. For the community sample socio-demographic variables explained up to 20% of the variability in scores, significantly higher than the explained variance due to socio-demographic variables for the risk issues ranked by the British public in previous research (Houghton et al., 1999). Other research has not determined the degree to which socio-

demographic factors affect RTB, outside of the influence of a single variable (e.g. age or gender). This indicates that everyday RTB is more affected by socio-demographic factors than other types of risk, which advances research investigating this relationship.

Of the socio-demographic variables in this study age had the highest correlations with all everyday risk domains for the community sample (the sample with the widest distribution of ages), and the highest correlation was 0.48 for the overall everyday risks score. These results support the hypothesis that older people are more risk averse (Steketee & Frost, 1994). Multiple regression analysis showed that age explained the highest amount of unique variance for all everyday RTB scales for the community sample. For a majority of the scales age explained more than three times the unique variance of any other factor, the exceptions being for risks to others and risks to belongings. It was hypothesised that the areas of risks older people will be most avoidant in was risks involving personal danger, and risks to belongings (Zuckerman, 1984), and this was partially supported. Risks involving personal danger had the strongest relationship with age, but risks to belongings did not, and risk aversion was more general than domain specific. The other samples had much less age variation, and this is the most likely explanation for age not being a significant predictor of everyday risk taking for the internet and student samples.

The reason for the strong relationship of age with everyday RTB could be for a number of reasons. United States college students reported engaging in RTB because they feel these opportunities will not be available in later life. This occurred in a wide range of areas, such as substance use, social situations including relationships, and in personal expression (Ravert, 2009). These examples are all included in the ERI-E, so could explain some of the differences in everyday RTB for different age groups found in this research. It was also found that people's judgement of risk was affected by people's direct experience, or of occurrences of risks in their social network (Pachur, Hertwig & Steinman, 2012). Therefore as people get older the number of experiences of risk increases, and they are more likely to become risk averse.

There are a few possible reasons for the strong relationship between age and everyday RTB, suggested by the domain specific effects. Older people being particularly risk averse for risks involving personal danger is likely to reflect the fact that these risks carry more serious complications for them. An injury to older people can be more serious for them, and they may feel they have less ability to protect themselves, with a similar affect occurring for health risks. Fear of crime research shows that older people do fear crime more (Jackson, 2006), and results from the present research indicate this is due to threat to themselves, rather than threats to belongings. Social risks also had a stronger relationship with age than most other domains, and this may reflect that older people have had social relationships for longer periods of time, and

are less prepared to risk the relationships they do have, and are also less concerned about taking risks in order to form new relationships.

There are two other important aspects of the affect of age on everyday RTB. For the older participants (aged over 40) a far higher percentage of everyday RTB was explained by socio-demographic variables than for younger participants. Another difference between younger and older groups was that for older people having children made them more risk taking, but for younger people having children made them more risk averse. This relationship was consistent for all domains of everyday RTB, as well as the overall score. Age was the most important variable in explaining the everyday risks score, compared to any other socio-demographic factor. Research is advanced in this area by expanding the knowledge about the domains of everyday RTB most influenced by age, and the influence of age on the relationship between RTB and people being parents.

The amount of income people earned was the second most important explanatory variable, with the community sample being the only relevant sample for income levels as this was not collected for the internet sample, and was not relevant for the student sample due to the low incomes of almost all participants. Correlations between income and all measures of everyday RTB were significant; with the correlation with overall everyday risks score exceeded 0.2 and the highest correlation with a single domain score being for risks involving personal danger. In all cases people with higher incomes were more risk taking, supporting the hypothesis that low income and unemployed people will be more risk averse (Boholm, 1998). Multiple regression analyses showed that income was a unique predictor of variability in scores, for the everyday risks score, and all domains other than social risk taking. The amount of unique variance explained was highest for everyday risks, and risks to belongings. This advances research, as the relationships between everyday RTB and income have not previously been researched.

That people on higher income seem to not be so concerned about risks to belongings may reflect an ability to replace items if they were stolen, compared to people on lower incomes. Income was also a more important factor in explaining everyday RTB scores for males compared to females. For overall everyday risk taking in particular, males were more risk taking when their income level was higher, but this was not the case for females. One possible explanation for this difference is the theory that people who possess more power are more likely to take risks (Anderson & Galinsky, 2006; Flynn et al., 1994). As for males power is more based around income than for women, this theory could explain the gender difference.

The relationship of RTB for different genders was complex. Females were more risk averse for risks involving personal danger and risks to others, but more risk taking for unknown risks (see

Table 20). Multiple regression analyses showed that risks involving personal danger were particularly avoided by women, and this reached a level of statistical significance in all three samples. This supports the previous research that found risks to personal safety had the biggest gender differences (Boholm, 1998). It was hypothesised that social risks would have the least difference between genders (Gillen et al., 2004), and this was partially supported, as gender did explain a smaller amount of unique variance in social risk taking, but at a similar level to a number of other domains.

The reasons females are more likely to take unknown risks is difficult to explain. These types of risks involve taking a risk when the exact nature of the risk is unknown, for instance moving to a new city could have many different types of risks. This effect was particularly strong for older females. More research would be required to determine the reason for this result.

There were also significant differences in the important factors for explaining the variability in everyday RTB scores for males and females. In particular males who had dependent children were more risk averse, but having dependent children was not a significant factor in explaining risk taking for women. Age also played a more important role in explaining variability in risk taking scores for males than for females, particularly for unknown risks. Overall the variability in everyday risk taking scores explained by variables included in the study was higher for men than for women, except for health risks for which the amount of explained variance was similar. This is an area of research that had not been previously studied.

Ethnic background played a significant role in everyday RTB. Maori and New Zealand European participants were similar in their RTB, but people from other ethnicities (predominantly Asian and Pacific Islanders) were significantly more risk averse than the rest of the sample. This relationship was highly significant for all risk taking measures, even after taking into account the effects of other factors, such as age and income. The strongest relationship was with risks to belongings, and health risks. This finding has not occurred in previous research, and the reasons for the results obtained are open to various interpretations. The theory that risk taking is related to power may explain these differences to some extent (Flynn, Slovic, & Mertz, 1997). More recent immigrant groups may feel less power and therefore be less likely to take risks than people who have either been in the country for longer, or feel like they are the majority ethnic group. Interpretation of these results needs to take into account the small number of people in the ‘other’ group for ethnicity.

Relationship status also had a significant effect on people’s RTB. People who are married are more risk averse than people with other types of relationships, even after the effects of age and income are taken into account, consistent with the results of Boholm’s (1998) research on

environmental risks. This result is significant for everyday risk taking in general, but most significant for social risk taking. It may be due to the fact that people wanting relationships may feel they need to take social risks in order to achieve that, whereas once people are in relationships they do not need to take the same type of risks, and in fact may avoid taking social risks for fear of upsetting their partner.

Less consistent relationships between socio-demographic variables and everyday RTB were found for other factors. Employment status did not make a significant difference for overall everyday risks, but did for some domains. People who were working full time were more risk taking in the areas of social and health risks, whereas people who were not working were more risk averse in the areas of risks to belongings and unknown risks. It was hypothesised that people who are unemployed are more risk averse (Boholm, 1998), and this is partially supported by these results, as this group were more risk averse, but only in some domains of everyday RTB. The increased social contact of people who work may explain the difference in social risk taking, and people who are not working having less money may explain why they are particularly risk averse for risks to belongings.

Other socio-demographic variables had less important relationships with risk taking, once the effects of other socio-demographic variables (particularly age) were taken into account. People who had a tertiary level qualification were less risk averse, but this group were also significantly older than other participants. Once the affects of other socio-demographic variables (particularly age) were taken into account, having a tertiary level qualification did not account for more than 2% of the variability in scores for any of the domains. Similarly, although there were significant correlations between everyday RTB scores and people having dependent children, having dependent children did not explain a significant amount of the variability in everyday RTB scores once the affects of other socio-demographic variables (particularly age) were taken into account. The differential affects of having children on males and females, and older and younger participants, have been discussed earlier.

The population of the place people lived in was more important for risks to belongings, people who live in areas with larger populations were more risk averse (for the community sample), and for the student sample people living in larger urban areas were more risk taking for social risks. It was hypothesised that people that live in small towns would be risk averse (Boholm, 1998), but this was not supported by the results of this research. The reason for these results may be that people in smaller towns are more likely to know their neighbours, and therefore feel they are less at risk of their belongings being stolen. The reason for the result with the student

sample may reflect these people having moved to a new city to attend university, and having to take some social risks in order to develop new social relationships.

3.4.4. International Differences in RTB

It was hypothesised that there would be differences in overall everyday RTB between countries, (Boholm, 1998; Cicolini & Rees, 2003), and this was supported. New Zealand and United States participants differed on overall RTB score, as well as for four of the six domains after the effects of important socio-demographic variables (age and income), which were different between the two groups of participants, were taken into account. There does appear to be significant differences in the everyday risks that people from different countries are prepared to take, in this case United States participants were significantly more risk averse than New Zealand participants, apart from in the domains of risks involving personal danger, and social risks. Previous research has shown that Australians were less risk taking for everyday risks than United States participants (Cicolini & Rees, 2003), so this result was unexpected, as it was expected that New Zealand and Australian participants would be similar, being neighbouring countries with similar cultures.

3.5. Conclusion

The hypothesised relationships between anxiety, depression and everyday RTB were in general not supported. Anxiety level has a weak relationship with everyday RTB, and although the correlations were generally in the direction expected, the weakness of the relationships meant many results were not statistically significant. Analysis of previous results shows that only people with OCD have shown strong relationships with RTB (Rees et al., 2005). Whether the relationship between RTB and anxiety has been significant in past research has been largely due to sample size, the type of sample, and possibly the measures used. The low response rate for the community sample (31%) is an example of how the results from this research may have been different to previous studies. The results in the present study can therefore be considered consistent with past research, the relationship between anxiety level and everyday RTB is weak.

This pattern also applies to relationships between depression level and everyday RTB, although some previous research has found some significant relationships, this has been inconsistent, and a weaker relationship than for anxiety. In this research depression level was not important in predicting everyday RTB, apart from a few exceptions, as noted in section 3.4.2.

Socio-demographic factors played a far more significant role in explaining the variability in RTB than anxiety or depression level. Age in particular was an important factor, older people

are more risk averse than younger people. Income almost played a significant role, with people on lower incomes being more risk averse, and in general hypotheses with respect to socio-demographic factors were supported. The theory that people who have power in society take more risks (Anderson & Galinsky, 2006) received some support, particularly in the findings that people of lower income and in the 'other' ethnic group category were risk averse. It therefore seems likely that risk aversion (for everyday risks) is more associated with the person's socio-demographic status than their level of anxiety (or depression).

In line with previous research, where gender differences in society are less, so too is the gender difference in RTB (Olofsson & Rashid, 2011), and this was supported in this research. The white male affect (Flynn, Slovic, & Mertz, 1994) was not present, and this may be due to smaller differences between both gender and race compared to where this affect has been detected, the United States. This area of research advances knowledge of the factors that affect everyday RTB in many ways. In particular showing that complex factors often interact to affect the risks people are prepared to take, above those explained by each individual factor alone.

Overall these results indicate that people's level of anxiety does not have a large impact on the whether they undertake everyday risks. Beck's (1976) cognitive triad for anxiety included anxious people viewing the world as a dangerous place. If this is the case viewing the world as dangerous does not lead anxious people to be particularly risk avoidant, at least in non-clinical samples. That socio-demographic factors were significantly more important in explaining everyday RTB than anxiety or depression was unexpected, however this was particularly the case in the community sample, which measures a far broader range in these variables than samples used in previous research. It therefore appears that people's everyday RTB is more affected by their life circumstances than their mental health state (anxiety or depression), which is expected as RTB is known to vary across different life stages (younger people are known as being more risk taking), particularly for those involving risk of injury.

Chapter 4: Cognitive Theories for Anxiety and the Role of Everyday RTB.

4.1 Introduction

Research into the relationship of anxiety and depression with RTB has generally focussed on the correlation with symptoms of anxiety and depression with RTB, rather than the cognitions associated with these constructs. The only cognitive factor associated with anxiety or depression to be previously studied in relation to risk is worry. That research found that perceived risk had a stronger association with worry than emotional distress (Kobbetveld et al., 2005). This section of the research aims to investigate whether everyday RTB has a stronger relationship with cognitive factors associated with anxiety and depression than with symptoms of anxiety and depression themselves, as measured by clinical measures such as the BDI (Beck, Steer & Brown, 1996), BAI (Beck & Steer, 1990), and DASS (Lovibond & Lovibond, 1995).

The reason to specifically focus on cognitive factors rather than other variables (such as personality traits of anxious and depressed people) is that many models of anxiety and depression, such as *Schema Theory* (Beck, 1967), and the *Metacognitive model of GAD* (Wells 1999), hypothesise that cognitive factors lead to anxiety/depression, and then emotional and behavioural consequences of experiencing anxiety/depression occur. Also, cognitive behavioural therapy (CBT) is an empirically supported treatment for both anxiety and depression (Roth & Fonagy, 2005), and changes in cognitions are associated with successful treatment of these types of disorders (Hollon, Stewart & Strunk, 2006). If RTB has a stronger relationship to cognitive factors than to symptoms of anxiety/depression, this is consistent with the hypothesis that being risk averse is due to cognitive factors that predispose people towards anxiety/depression rather than risk avoidance being a behavioural consequence of experiencing anxiety/depression.

Given the stronger link of everyday RTB with anxiety, in comparison to depression, both in previous chapters of this research project, and existing literature (Hockey et al, 2000; Stober, 1997), the focus of this section will be on cognitive factors associated with anxiety. To identify important cognitive factors to investigate in this section of research, and in particular those factors considered to predispose people towards anxiety disorders, existing cognitive models of anxiety will be analysed and discussed.

Results from the previous chapter showed that levels of anxiety and depression both have weak relationships with RTB, with depression not having a significant effect on RTB, and anxiety level only having a correlation with overall everyday risks in one of the three samples, the community sample. Less than 3% of the variability in the everyday risks score was explained by

anxiety level in the community sample. This indicates that mediation effects are likely to be very weak or non-existent, and any observed relationships are likely to be due to direct affects of cognitive factors on RTB, not mediated by anxiety or depression level. If correlations between anxiety and depression level and measures of everyday RTB are higher for this chapter of the research than for previous chapters, the mediation affects of anxiety and/or depression level on the relationship between cognitive variables and RTB measures will be analysed.

In summary, the relationships being investigated in the two studies are provided in Figure 3. The key difference is that there is only a weak relationship expected between RTB and anxiety level in study 2, and instead cognitive factors significantly impact on both anxiety level and RTB.

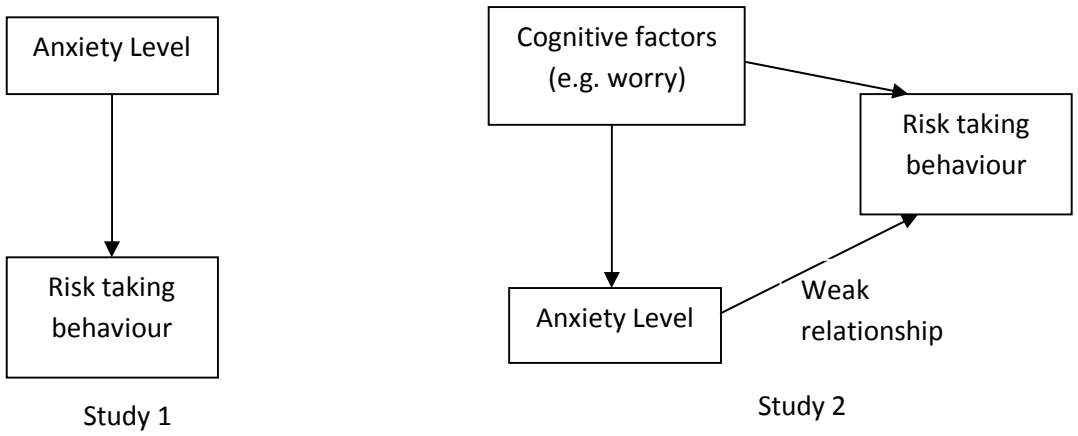

Figure 3. Models being tested in Studies 1 and 2.

4.1.1 Previous Research of Cognitive Factors Associated with Anxiety and RTB.

There has been little research on the links between cognitive variables associated with anxiety and risk, with the exception being studies investigating the relationship between perceived risk and worry. One study found that worry made people sensitive to the possibility rather than the probability of negative consequences, and worry made people unwilling to take risks if there were possible negative consequences, no matter how unlikely these were (Loewenstein et al., 2001).

Other research found that the relationship between worry and risk is quite specific as emotional distress did not correlate with perceived risk, but worry did, and the causal chain is from perceived risk, to worry and then to emotional distress (Kobbeltved et al., 2005). Emotional distress was measured using the Impact of Event Scale, which is typically used to measure Post Traumatic Stress Disorder (PTSD) symptoms, and also has significant correlations with measures of anxiety (Sundin & Horowitz, 2002). This indicates that RTB will have a closer

association with cognitive factors associated with anxiety, than to measures of emotional distress used in previous risk research, as RTB has a high correlation with risk perception (Weber et al., 2002).

Worry is an important factor in many cognitive models of anxiety such as the Metacognitive model of GAD (Wells & Carter, 1999). Worry is a common human experience, only when it becomes excessive, uncontrollable and chronically present does it lead to a loss of joy in life, and becomes intolerable, leading to anxiety disorders (Borkovec, Ray & Stober, 1998). The DSM-IV descriptions of some anxiety disorders include worry as one of the symptoms, particularly generalised anxiety disorder, in which worry is excessive and difficult to control (American Psychiatric Association (APA), 2000), but also panic disorder with agoraphobia. However, given the lack of research into the relationship between cognitive factors of anxiety and RTB, more research is needed to establish if cognitive factors are important in explaining differences in people's everyday RTB. Determining the cognitive factors to study is important, and those factors in commonly used cognitive models of anxiety will be identified in order to determine the relationships between cognitive factors and everyday RTB in this research.

4.1.2 Cognitive Theories of Anxiety

Cognitive models of psychopathology were first proposed in the early 1960's, with Beck's schema theory (1967) being amongst the first models. The majority of models developed were to explain a particular type, or group, of disorders. Models used to explain anxiety disorders range from those used to explain anxiety in general, and those used to explain specific anxiety disorders. Models for generalised anxiety include Beck's three stage model for anxiety (Beck, 1976), the metacognitive worry model (Wells & Carter, 1999), a model for GAD incorporating Intolerance of Uncertainty (IU) (Dugas, Gagnon, Ladouceur & Freeston, 1998), and the looming maladaptive threat model (Riskind, 1997). Models for other anxiety disorders include a model for panic disorder (Clark, 1986), one for panic disorder and hypochondriasis (Salkovskis & Clark, 1993), and a model for social phobia (Stopa & Clark, 1993). The later models are not relevant to this study, as they are developed to explain specific features of these disorders, rather than cognitive factors leading to more general types of anxiety.

Criteria used for selecting models, and identifying important cognitive factors, were that they were well researched, and the research conducted showed they were applicable to more than one specific disorder. Using the first criteria, the only model for GAD not selected was the looming maladaptive threat (LMT) model. This model proposes that anxiety occurs when individuals experience an acute subjective state of looming vulnerability in which danger seems to be increasing and unfolding from instant to instant towards some catastrophic end, creating a sense

of rapidly rising risk (Riskind & Williams, 2006). However it has only been researched by Riskind and associates, and so did not meet the criteria for adequate research evidence supporting it.

Although a number of models discussed are specified as models for generalised anxiety disorders, research has shown that none of them are specific to this disorder, and they would more correctly be labelled as models of anxiety in general, even though some research has shown them to be more applicable to people with GAD than other anxiety disorders (Fisher & Wells, 2011). Given this, although the models considered here were developed for either anxiety disorders in general, or for generalised anxiety disorder, they can be considered to all be measuring anxiety rather than a specific disorder. There has been no specific research into the relationships between everyday RTB and the cognitive models discussed here.

4.1.2.1 Schema theory.

Becks schema theory proposed that people have schema which account for the types of cognitions people have, which predispose them to suffering from anxiety and depression (Beck, 1967; Beck, 1976). A schema is a generalised knowledge about a situation or event (Matlin, 2005), that is used to make sense of the world. Beck (1967) suggested that a specific cognitive set, or bias, influences information processing from the early stages of perception, through to long term memory storage and recall. It is the activation of specific schemas in people who are anxious and depressed that forms the basis of his cognitive triads for these disorders. These consist of common schemas for the way in which these groups view themselves, the world, and the future.

Beck's cognitive model of anxiety states that anxious people view neutral or ambiguous stimuli as threatening (Beck, 1976). They make these decisions quickly, based on little data, and selectively attended to stimuli that represent danger (Beck, Emery & Greenberg, 1985). Following this they make a secondary appraisal based on whether they have the ability to cope with the perceived threat. The last step is overestimating the danger present in the situation (Beck & Clark, 1997), before deciding on what their response will be. The central feature of anxiety disorders is therefore a person's preoccupation with danger, and their responses to it, and a tendency to dwell on the worst possible outcome of a situation. By talking or thinking about a dangerous situation, they make the threat more salient and imminent, bringing the distant danger into the present (Beck et al., 1985). People with anxiety disorders view the world as threatening and estimate the threat as being beyond what they are able to cope with.

Following the initial appraisal the individual enters a secondary appraisal mode, which is characteristically slow, effortful and schema-driven. The first stage of the secondary appraisal

mode is worry, which is an elaborative process resulting from activation of both the primal threat mode and other more constructive, reflective modes of thinking (Beck & Clark, 1997). The second stage is where the person is trying to return to a feeling of safety (Rachman, 1984), which varies depending on the anxiety disorder. In agoraphobia it involves not leaving the house, in social phobia avoiding social situations, and in OCD compulsive checking and counting. Anxious patients are usually aware of their safety signals, and often spend a great deal of time planning to maximise their sense of safety (Beck & Clark, 1997).

Schema theory is also used to explain depressive disorders. People with depression have a negative view of themselves the world and the future (Beck, 1967). They see the world as being an unfair place, themselves as being worthless, and the future as being hopeless. One key difference is that in depression there is a tendency to dwell on the past and on loss related events, whereas with anxiety the cognitions are more focussed on the future, and on danger (Clark, Beck & Brown, 1989; Eysenck, Payne & Santos, 2006). The schema in depression often have a conditional content such as “If I make a mistake, I’m a failure”, and are thought to develop from an early age, with their affect on self-concept often apparent only when people are severely depressed (Beck, 1967). These negative schema during depressive episodes result in behavioural changes, such as reducing their contact with other people, and not engaging in previously enjoyed activities. This reinforces their belief that they are worthless, and there is no hope for the future. Their inability to see a positive future leads to focusing on the past, and their negative schema mean they focus on past losses rather than past successes.

Although there are some differences between the schema associated with anxiety and depressive disorders, research has shown that anxiety and depression have similar correlations with a measure of dysfunctional schema, the Dysfunctional Attitudes Scale (DAS) (Westra & Kuiper, 1996). It is hypothesised that people with high levels of dysfunctional cognitions (as measured by the DAS) would be risk averse. Given the stronger link between everyday risk taking with anxiety, in comparison to depression, both in previous chapters of this research project, and existing literature (Hockey et al, 2000; Stober, 1997), and that this measure is not specific for anxiety, it is expected that measures of dysfunctional schema will have a lower correlation with everyday RTB than measures of cognitive factors specifically associated with anxiety.

4.1.2.2. Metacognitive model of GAD.

Wells (1999) metacognitive model of anxiety is based on the role of worry in maintaining anxiety, and is shown in Figure 4. Following a triggering event positive beliefs about worry

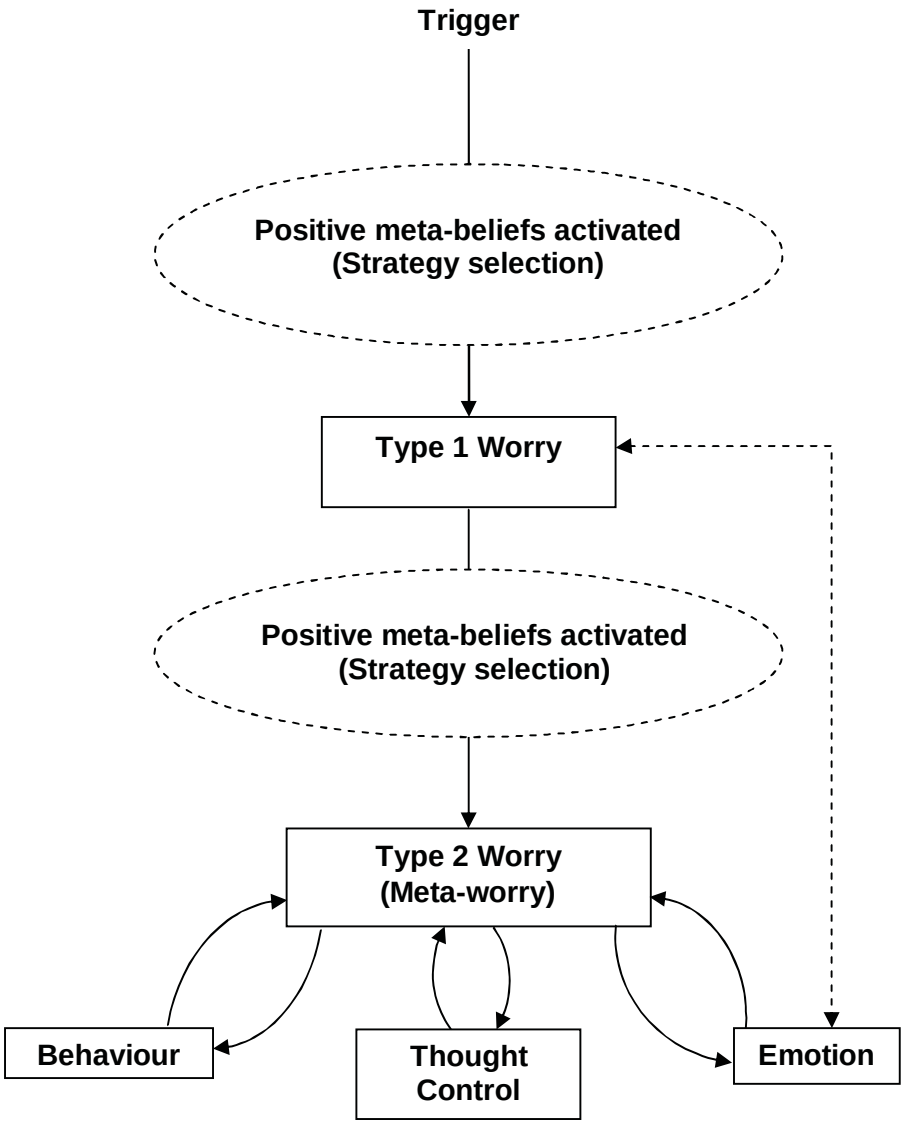

Figure 4. An outline of Well's metacognitive theory for GAD, from Wells (1999).

occur, such as that worrying serves a protective or coping function. The content of these worries generally focuses on themes related to health, interpersonal and other everyday concerns (Fisher & Wells, 2011). However, as this worry continues negative beliefs occur, based on the inability to control the worry, and the dangerous consequences of worrying. Wells (1999) labels this type of worry as metaworry, worrying about worrying. This impacts on their behaviour, thoughts and emotions, which in turn leads to further worrying, and a vicious cycle of increasing worry and anxiety (indicated by emotion in the model) occurs.

Dysfunctional strategies employed include avoidance of situations that trigger worrying, reassurance seeking, and checking. These behaviours maintain the anxiety, as they prevent exposure to situations that can prove that worry is harmless and controllable (Fisher & Wells, 2011).

The anxiety (indicated by emotion) is also maintained because the repeated generation of negative possibilities leads to a greater sense of vulnerability and danger, and the use of hypervigilance and avoidance strengthens beliefs about the positive aspect of worry.

Although the model was developed for generalised anxiety disorder, worry and other aspects of the model are a feature of a number of anxiety disorders. The hypervigilance and positive beliefs about worrying, along with behaviours and cognitions to attempt to reduce worry, are characteristics of OCD. The feedback mechanisms lead to panic disorder when the anxiety and worry become out of control, leading to panic. Avoidant behaviour maintains anxiety in specific phobias, as by avoiding the source of the phobia, the individual does not learn that danger they perceive does not actually exist. Social anxiety is also explained by this model in the interpretation of threat in public situations, and the use of avoidant behaviour to deal with that threat. It can therefore be seen as a model for anxiety generally, rather than just GAD.

Research evidence supporting model

There is research that supports the metacognitive theory of anxiety. It has been shown that metaworry frequency is directly associated with GAD, and that the relationship between metaworry beliefs and GAD is dependent on metaworry frequency (Wells, 2005). Problematic worry is directly associated with metaworry, rather than other aspects of worrying such as beliefs about the controllability of worry, and worries related to health and social situations (Wells & Carter, 1999). Also, increased tendency to worry was associated with greater disapproval of worry-related intrusions, and with a strategy of replacing a worrisome intrusion with another unpleasant thought (Watkins, 2004). When analysed alongside a range of other cognitive variables, metaworry made a unique and independent contribution to trait worry, and was a partial mediator of the relation between neuroticism and trait-like worry (de Bruin, Rassin & Muris, 2007).

It has also been shown that negative beliefs about worry are consistently associated with worry and obsessive symptoms in a sample of undergraduate students. In particular, these beliefs were focussed on danger and uncontrollability (Sica, Steketee, Ghisi, Chiri & Franceschini, 2007). Furthermore, metacognitive appraisals of worry as uncontrollable and dangerous differentiate high worriers with and without GAD (Ruscio & Borkovec, 2004). Negative metacognitive beliefs about the uncontrollability and dangers of worrying have also been found to predict the development of GAD in prospective analyses of non-patients (Nassir (1999) as cited in Wells & Matthews, 2006), and beliefs about worry are related to the level of worry (Freeston et al., 1994).

The importance of worry in anxious disorders is also shown in other research. Worry serves the purpose of avoiding threats, but anxious subjects selectively attend to threatening information, and interpret ambiguous events as threatening (Mathews, 1990). How specific this is to anxiety disorders is disputed however, as it appears to also be a feature in mood disorders, with the content of the stimuli varying between different disorders (Wells & Carter, 1999). High worriers evaluate the occurrence of feared consequence for each worry as more likely to happen, and the ultimate outcome as being more severe. As a group, high worriers ultimate outcomes were more similar than low worriers, indicating similar threat schema existing (Provencher, Freeston, Dugas & Ladouceur, 2000). An important factor is that highly ambiguous events may cause uneasiness and increased worry in just about all individuals even though the degree may vary, but moderately ambiguous events cause more uneasiness in high worry compared to low worry groups (Ladouceur, Talbot & Dugas, 1997).

Worry is particularly linked to generalised anxiety disorder (GAD) in the DSM-IV (APA, 2000), and while there is some evidence that this is the case (Chelminski & Zimmerman, 2003), other research shows that worry is more general to anxiety disorders (Gladstone et al., 2005; Ladouceur et al., 1999), specifically social anxiety disorder (Starcevic et al., 2007). What does differentiate worry in people suffering from GAD, is that they worry excessively about minor matters (Brown, Moras, Zinbarg & Barlow, 1993; Sanderson & Barlow, 1990), and everyday routine life circumstances (Craske, Rapee, Jackel & Barlow, 1989; Roemer, Molina & Borkovec, 1997). Although worry is most associated with anxiety, some research has shown a significant relationship between worry and depression (Gladstone et al., 2005; Watkins, 2004), which in some studies is of a similar magnitude (Freeston et al., 1994; Muris, Roelofs, Rassin, Franken & Mayer, 2005). In one study a similar degree of excessive thinking when worrying was present occurred in both GAD and dysphoric groups, which was higher than a control group (Molina, Borkovec, Peasley & Person, 1998). Worry may be qualitatively different between different disorders, and there may be different beliefs in the degree to which the worry is controllable (Starcevic et al., 2007).

In spite of the overall metacognitive model not having been tested, there is strong research evidence for the components of the model, including the links between factors within the model. A majority of the research supports it as a model of anxiety in general, with its specificity to GAD doubtful, making it suitable for use in this research. The theoretical basis is sound, and ongoing research provides continued support for the principles of the model. Given the relationship between worry and RTB from previous research (Kobbeltved et al., 2005); it is hypothesised that measures of other types of worry, including metaworry, health worry, and social worry, will also have significant correlations with RTB.

4.1.2.3. GAD model incorporating Intolerance of Uncertainty.

Intolerance of Uncertainty (IU) was first proposed as a feature of anxiety disorders by Krohne, (1989), and further developed by Freeston et al. (1994). The nature of the relationship between IU and anxiety was further developed with its incorporation into a cognitive model of anxiety, the GAD model incorporating IU (Dugas et al., 1998).

The definition of IU in the literature is inconsistent (Starcevic & Berle, 2006). One definition is the inability of individuals to tolerate any ambiguity in a situation, and leads to problems being perceived when none objectively exists (Freeston et al., 1994). Another is that it is the predisposition to react negatively to an uncertain event or situation, independent of its probability of occurrence and of its associated consequences (Ladouceurs et al., 1999), and a third is an excessive tendency to consider it unacceptable that a negative event may occur, however small the probability of its occurrence (Dugas, Gosselin & Ladouceur, 2001). The general theme is that IU is the tendency of individuals to avoid events or situations where the outcome is uncertain, regardless of how low the probability of negative consequences is, which is the definition that will be used in the present research.

The conceptual model of GAD assumes that IU has a central role, underlying beliefs about worry, cognitive avoidance, poor problem orientation, and anxiety (Dugas et al., 1998), and is shown in Figure 5. IU is important as it leads to inefficient initial reactions to problems, and could contribute to poor orientation to difficulties in life (Freeston et al., 1994). The model also underscores the importance of beliefs about worry to GAD, consistent with the metacognitive model of GAD (Wells, 1999). Another main feature of the model is poor problem orientation, which may be defined as a set of metacognitive processes that reflect awareness and appraisal of everyday problems, and one's problem solving ability (Maydeu-Olivares & D'Zurilla, 1996). A final feature of the model is the identification of cognitive avoidance as an important process variable in GAD (Dugas et al., 1998).

Research evidence supporting model

There is research evidence supporting the central role of intolerance of uncertainty in GAD. IU played a pivotal role in a discriminant function for classifying GAD patients and non-clinical controls into their respective groups (Dugas et al., 1998), and it also differentiated GAD patients from other anxiety disorder patients in one study (Ladouceur et al., 1999). It was a strong predictor of worry, beyond the affects of trait anxiety, and worry explained different aspects of negative thinking such as emotional problem orientation (Dugas et al., 1997). Worry, IU and trait anxiety were all highly correlated (Khawaja & Chapman, 2007), and IU made a unique

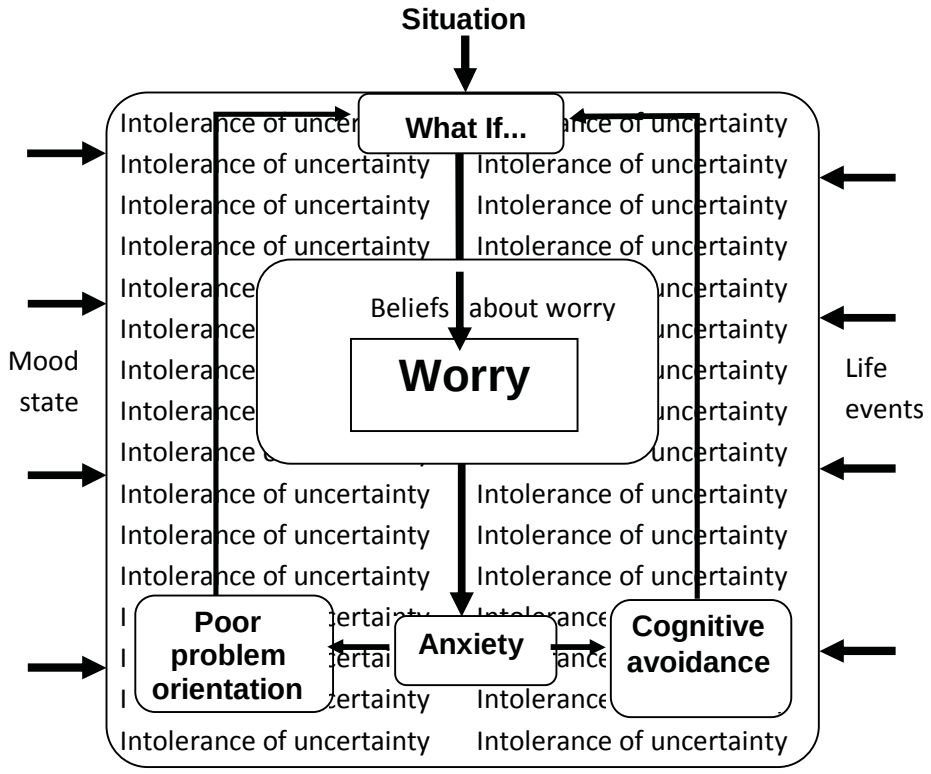

Figure 5. An outline of GAD model incorporating Intolerance of Uncertainty (IU), from Dugas et al. (1998).

contribution to worry scores in a clinical sample, beyond that of other cognitive measures (Dugas et al., 2007). IU was a more salient predictor of worry than other cognitive processes such as perfectionism and perceived control (Buhr & Dugas, 2006), and IU and negative problem orientation had more robust associations with the severity of GAD than did positive beliefs about worry and cognitive avoidance (Dugas et al., 2007). Also, during therapy for GAD changes in IU were related to treatment outcome, and to a reduction in the level of worry (Dugas, Buhr & Ladouceur, 2004). However, IU has also been associated with other disorders.

IU has been found to be related to symptom levels of OCD, social anxiety and GAD, but not depression, with the strongest relationship being to OCD (Boelen & Reijntjes, 2009), with the concept of IU originally developed to explain cognitions occurring in OCD (Steketee, Frost & Cohen, 1998). IU explained a significant amount of variance in social anxiety severity when controlling for established correlates of social anxiety, such as fear of negative evaluation, and neuroticism (Boelen & Reijntjes, 2009). In one study IU was found to be highly related to a tendency to worry excessively and uncontrollably, moderately related to obsessions and compulsions, and weakly related to panic sensations (Dugas et al., 2001).

The GAD model incorporating IU as a whole has never been tested, and although the individual relationships are supported by research, the overall model still requires validation. The complex nature makes testing it very difficult, as intolerance of uncertainty interacts with every other

variable in the model, but the nature of interaction is unclear. It has many similarities to the metacognitive model, i.e., a situation leads to worry, and the consequences of this are anxiety, which has behavioural and cognitive features that feedback into a cycle leading to more worry and increasing anxiety. The key difference is that IU impacts on all aspects of the cycle, leading to GAD. As research evidence supports the role of IU in anxiety, and there is research evidence supporting a similar model, the metacognitive model, this lends some support for the IU model of Dugas et al. (1998).

In the other cognitive models reviewed in this chapter, cognitive factors (such as worry) occur before anxiety symptoms occur. Given that IU underlies all other aspects of anxiety, it is unclear whether it should be considered as specifically being a cognitive factor leading to anxiety. Given it is a strong predictor of worry beyond the affects of trait anxiety, and worry is generally considered to lead to anxiety, it is more likely to be a cognitive factor leading to anxiety than a consequence of experiencing anxiety.

The relationship of IU to everyday RTB has not been investigated, but it is expected that the correlation of IU and measures of everyday RTB will be higher than for other cognitive variables included in this study (worry, metaworry, and dysfunctional schema). This is because the definition of IU includes an avoidance of events and situations, indicating people will be risk averse generally. It also incorporates the idea of avoiding risk, even when the probability of negative consequences is low, which is the case with many aspects of everyday risk taking.

4.1.2.4. Four factor theory of anxiety.

Eysenck's (1997) four factor model of anxiety attempts to incorporate many of the features of other models into a more complex formulation of anxiety. The key theoretical assumption is that the emotional experience of anxiety is influenced by four different sources of information. The most important is the cognitive appraisal of the situation. The other three factors are the high physiological arousal that can lead to the experience of anxiety, even if the source of the arousal is not attributed to the situation, the individuals own action tendencies and behaviours, and the cognitions the person experiences (Eysenck, 1997).

The model is shown in Figure 6, and makes two major predictions, that experienced anxiety (the emotional experience) depends on these four factors, and that the effects of each factor or source of information on experienced anxiety depends on intervening attentional and interpretive processes (Eysenck, 2000). There are a number of other assumptions of this theory. These include that highly anxious individuals have cognitive biases leading them to exaggerate the threat of external and internal stimuli, and highly anxious individuals also have an opposite

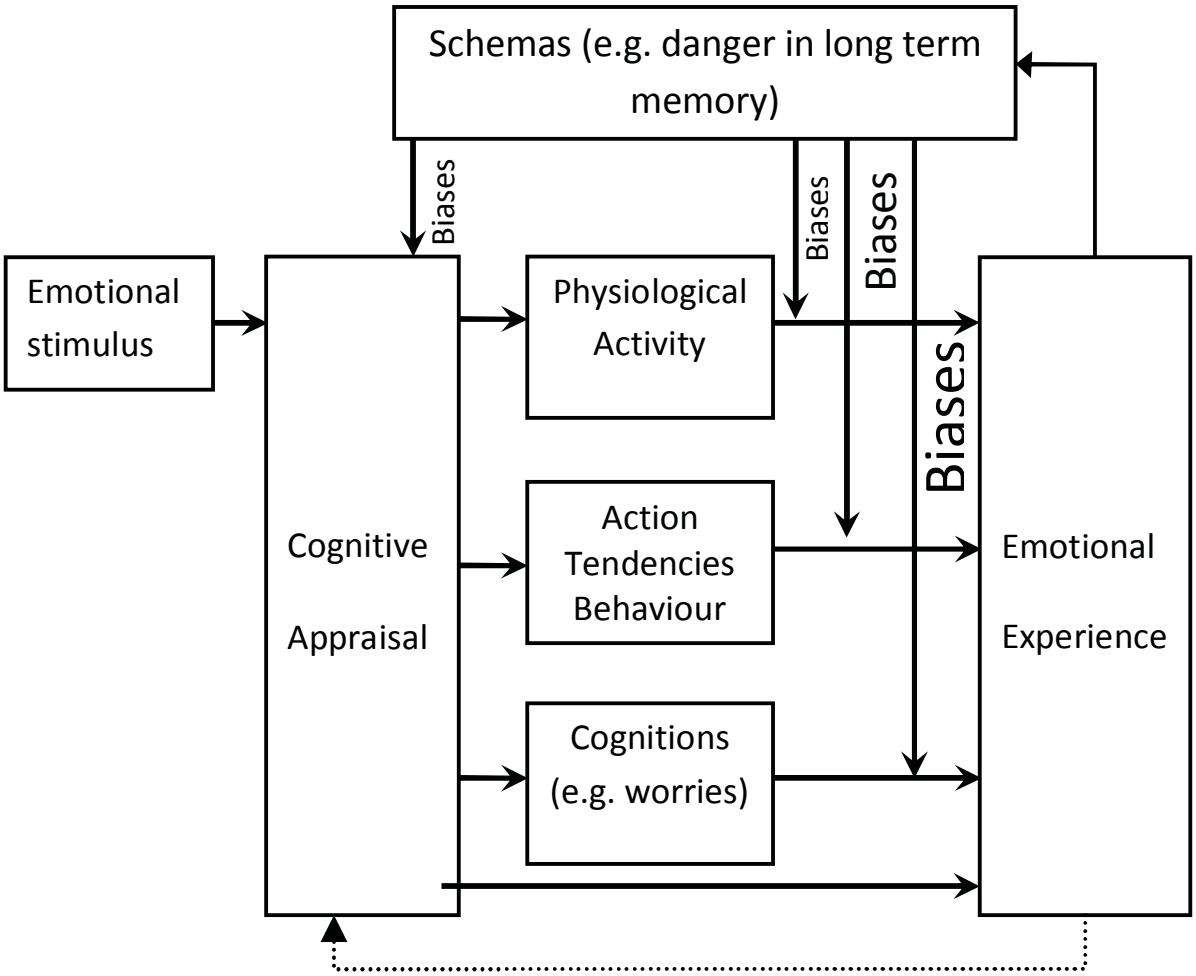

Figure 6. An outline of the four factor model of trait anxiety, from Eysenck, (1997).

attentional bias, leading them to avoid attending to threat related external and internal stimuli (Eysenck, 2000). These biases are higher when state anxiety is high, and the level of experienced anxiety depends in part on the cognitive biases. These biases operate below the level of conscious awareness, and experienced anxiety is determined at least in part by these cognitive biases (Eysenck, 1997).

The four-factor theory is consistent with schema theory (Beck, 1967) in that a person's schema influences their cognitive appraisal of a situation, and also how the emotional experience is affected by our physiological activity, behaviours and cognitions. Although the schema may vary between disorders, the affect is similar. It is also very similar to the theory underlying the 5 part model of CBT, where our thoughts, behaviours, emotions and physical reactions are affected by the way we initially interpret an event (Padesky & Mooney, 1990).

The four-factor model contains elements of the metacognitive model of GAD and the GAD model incorporating IU, in that the worries precede emotional experience, but differs in that the emotional experience occurs after the action tendencies behaviours, whereas in the other two models they occur at the same time. There is also no direct link in the four factor model between cognitions, physiological activity, and behaviour, although feedback mechanisms mean there are indirect links. Eysenck (2000) also defines highly anxious individuals differently from other models, in that these individuals also score low in defensiveness, as well as high in trait anxiety. As the model was developed in 1997 it also does not incorporate some more recent cognitive aspects of anxiety such as metacognition and intolerance of uncertainty.

Research evidence supporting model

There is a wide range of research evidence supporting various aspects of the model (Eysenck, 2000), although the model as a whole has not been tested. It was developed from research evidence of characteristics of anxious people, and this includes that anxious people rate the situational danger of events as higher than a control group (Arntz, Rauner & Van den Hout, 1995), and that people high in trait anxiety have more cognitive biases (Logan & Goetsch, 1993). There is evidence of threat avoidance in repressors, such as slower colour naming for threat related words than neutral words in a modified Stroop task (MacLeod & Rutherford, 1992), and high trait anxious individuals produced significantly more threatening interpretations than did low-trait anxious individuals when interpreting homophones (Eysenck, MacLeod & Mathews, 1987). Support for the increased physiological activity in high trait anxious people comes from research showing that the injection of adrenaline causes larger increases in state anxiety for this group (Veltman, van Zijderveld & van Dyck, 1994), and that high-anxious participants attribute increased heart rate when speaking publicly to the talk being stressful and threatening, rather than exciting and challenging. The four factor theory is also supported by the importance of worry in anxiety disorders both in previous research and by DSM IV definitions, especially GAD, and is consistent with the principles underlying cognitive behavioural therapy, which is shown to be effective with anxiety disorders.

4.1.3 Important Cognitive Factors Derived From Models

A number of important cognitive factors are identified from the models discussed. Worry is a central feature of a number of the models, and is also included in the DSM-IV descriptions of a number of anxiety disorders (APA, 2000). Another factor in more than one model is the concept of schema, which is incorporated in both schema theory and the four factor model. Dysfunctional schema have been shown to be associated with psychological disorders, including anxiety (Otto, Pollack, Fava, Uccello & Rosenbaum, 1995; Westra & Kuiper, 1996). Other important cognitive factors that are central to their respective models are intolerance of

uncertainty (IU) and metaworry. Both of these factors have significant research showing their relationship to anxiety, both anxiety disorders and anxiety as a construct. Only worry has been linked to RTB in past research, the other cognitive factors have not been investigated, although the schema theory of Beck (1976) theorises anxious people viewing the world as a dangerous place, indicating dysfunctional schema will be associated with risk averse behaviour.

Wells (1994) differentiates worry into different components of worry, with type I worry separated into health and social worries, and type II worry labelled metaworry. The use of health and social worry categories mirrors the use of social and health risks as domains of the ERI-E. Determining the relationship of worry to RTB in specific domains is useful in determining how closely worries about health and social factors affect health and social RTB, respectively.

4.1.4. Hypotheses

The primary hypotheses for this section of the research is that the correlations between cognitive factors associated with anxiety and everyday RTB measures will be higher than those shown in the previous chapter between anxiety level and everyday RTB measures. In all cases people scoring highly on cognitive factors associated with anxiety will be risk averse. The cognitive measures that will be included in this research are measures of intolerance of uncertainty (IU), dysfunctional schema, and different types of worry, including metaworry, health worry, and social worry. Some of the cognitive factors are anticipated to have higher correlations to RTB than others. For correlations with the overall RTB score, IU is expected to have the highest correlation as it has a definition that incorporates aspects of RTB (see Section 4.1.2.3). Also, both IU and everyday RTB are strongly associated with OCD (Boelen & Reijntjes, 2009; Rees, Andersen, and Egan, 2005), indicating they share important features in common, indicating IU should be more highly correlated with everyday RTB than cognitive factors not specifically associated with OCD. Dysfunctional schema measures are expected to have a lower correlation with RTB scores than the other measures, as they are less specific to anxiety level.

There has been no research undertaken to determine the effect of cognitive factors in different domains of everyday RTB, so hypotheses are based on correlations between cognitive factors and everyday RTB domains that share some conceptual similarities. For example between IU and unknown risks, as people who are IU is more likely to avoid situations where the level of uncertainty is highest; i.e., where the type of risk is unknown. Similarly, different aspects of worry are expected to have higher correlations where they share some similarity with an everyday RTB domain, social worry with social risks, and health worry with health risks.

In terms of socio-demographic factors, research has shown that risk perception and RTB varies between countries (Boholm, 1998; Cicolini & Rees, 2003), and therefore samples from both New Zealand and an international sample (collected via the internet) will be collected to determine if the relationships found occur in different countries.

As there has been no previous research specifically testing the relationships between everyday RTB and cognitive factors associated with anxiety, all research in this section advances knowledge in this area.

4.2. Method

4.2.1. Samples and Procedure

There were two different samples collected for this part of the research; a sample consisting of New Zealand university students, and an international sample collected via the internet (see Appendix I for New Zealand version of questionnaires). All participants completed the same battery of questionnaires, and a demographic information sheet. There were some minor differences in the demographic information collected for each sample. A question on ethnicity on the student version was replaced by one asking about nationality on the internet version. Also, an extra category of population (over 1,000,000 people) was added to the internet version of the questionnaires, to account for larger urban centres in overseas countries. Age for the internet sample was collected in 10 year categories rather than actual age entered, as was done on the student version.

Student sample.

485 questionnaires were distributed to undergraduate university students from five different subject areas, at two different Massey University campuses (Wellington and Palmerston North). A brief outline of the research was given at the conclusion of lectures, and students collected questionnaires as they left, to complete elsewhere, and returned them using freepost envelopes. The questionnaires took approximately 15 minutes to complete. A total of 205 questionnaires (172 female, 32 male, 1 not specified) were returned (a response rate of 42%), from students ranging in age from 18-54 (M = 22.2; SD = 6.69). 79% of the respondents were NZ European/Pakeha, 3% Maori, 10% Asian, and 7% other ethnicities. 60% were single, and 90% did not have dependent children. The significantly higher number of females in this sample largely reflected the gender bias of the students in the lectures in which questionnaires were distributed (e.g. Psychology, Veterinary Science, Nursing Studies), rather than a higher proportion of females choosing to complete questionnaires.

Internet sample.

The second sample was conducted via the internet, promoted via four websites, Facebook, and three sites promoting internet based scientific research, two for international participants, and one for New Zealand participants only. Over 95% of respondents were from the sites promoting scientific research. Questionnaires took approximately 10 minutes to complete. 532 people answered at least some questions (397 female, 95 male, 40 not stated). In asking about nationality it was anticipated that people would state the country they lived in, however many answered the question with their ethnicity rather than their nationality, making accurate assessment of the countries respondents came from impossible. It was able to be identified that

at least 32% were from the United States, 26% from New Zealand, and 7% from the United Kingdom. 57% of respondents were under the age of 30, and only 5% were aged over 60 (age was collected in groups bands so average was unable to be calculated). 37% had a university/polytechnic qualification, and 31% had dependent children. 24% were married, and 25% were working full time. 30% lived in urban areas of between 20,000 and 100,000 people, with only 12% in towns smaller than 5000 people, and the same proportion in cities of more than 1,000,000 people. This sample would best be described as composed of at least one third from the United States, one quarter from New Zealand, and the rest a more general population sample. The low average age and percentage of people working indicating a significant proportion of the sample were tertiary level students.

4.2.2. Statistical Analysis

Data was analysed using SPSS for Windows (Version 19), and AMOS (version 19). Statistics used were the same as for previous chapters (CFA, correlational analysis, and ANOVA) and further information can therefore be found in sections 2.2.3 and 3.2.

4.2.2.1. Measures used.

The two measures used for the previous chapter (the DASS-21 and ERI-E) were also used for this chapter. The DASS-21 is used to measure the level of anxiety and depression, and the ERI-E is used to measure the level of everyday RTB. Results in Chapter 3 show that both measures have adequate psychometric properties to measure these constructs for the purposes of this research. A number of additional measures were used.

The *Dysfunctional Attitude Scale (DAS)* (Weissman, 1978) was originally developed as a 100 item measure, with items rated on a 7 point likert scale. It is developed to assess cognitive distortions in depression, and items represent seven major value systems, approval, love, autonomy, achievement, perfectionism, entitlement, and omnipotence. Its purpose is to measure cognitive vulnerability to depression, but given that people who have recovered from depression have DAS scores similar to those with have never been depressed (Otto et al., 2007), and that the correlation with anxiety and depression measures is of a similar magnitude (Westra & Kuiper, 1996), it may be considered to be more of a general measure of dysfunctional cognitive schema. Further support for this perspective is that the degree of change in anxiety sensitivity during treatment for anxiety was associated with the change in DAS scores (Otto et al., 1995)

The original DAS was split into two parallel forms with 40 items in each, but serious concerns have been raised about the equivalence of the two measures (Oliver & Baumgart, 1985; Power, Katz, McGuffin & Duggan, 1994), and generally only version A (DAS-A) is now used. The DAS has excellent internal consistency $\alpha = .84$ to .92, as well as high test-retest reliability over 8 weeks,

r = .80 to .84 (Dugas, Schwartz & Francis, 2004; Weissman, 1980). It has good evidence of discriminant and convergent validity (Oliver & Baumgart, 1985), and DAS scores decreased following successful treatment of depression (Whisman, Miller, Norman & Keitner, 1991), and anxiety (Burns & Spangler, 2001), especially when the treatment method was CBT (Butler, Fennell, Robson & Gelder, 1991). The DAS-A has been subjected to exploratory factor analysis, with variable results, most indicating a single factor solution is inadequate (de Graaf, Roelofs & Huibers, 2009). The proposed factor structures include a 25 item two factor solution (Cane, Olinger, Gotlib & Kuiper, 1986), a 24 item three factor solution (Power et al., 1994), and a four factor solution (Oliver & Baumgart, 1985). In a number of studies the reverse scored items loaded onto one factor, suggesting a methodological rather than conceptual factor solution (de Graaf et al., 2009). One of the difficulties with the DAS is therefore selecting a version that has adequate psychometric properties. Although given the range of factor structures proposed, as well as the number of items in various versions of DAS, there is no one version that fulfils these requirements that has been adequately tested. A decision was made to use the DAS-A-17, as it displays adequate psychometric properties, was developed using a large population sample, and is a brief measure that takes only a few minutes to complete. The two factor solution is a better fit than a one factor solution in the only research testing the factor structure of the DAS-A-17 (de Graaf et al., 2009). CFA values indicate a good fit for the two factor model (RMSEA=0.065, CFI=0.98, NNFI= 0.98), and all factor loadings were above 0.5. However, given the wide variation in factors found for the DAS-A, using the DAS-A-17 when it has only been used evaluated by one researcher is problematic. For these reasons, before the measure in this research the suitability of the factor structure proposed by de Graaf et al (2009) needs to be confirmed. It should be noted that the DAS is the only cognitive measure used where low scores indicate a level of cognitive dysfunction.

The *Penn State Worry Questionnaire (PSWQ)* (Meyer, Miller, Metzger & Borkovec, 1990) is a measure of general worry (no specific type) comprised of 16 items rated on a 5 point likert scale. It is designed to evaluate the tendency to engage in excessive and uncontrollable worry. It was originally developed as a single item measure, with high internal consistency, α = .86 to.95, across a range of groups with anxiety disorders, and a control group (Brown, Antony & Barlow, 1992). It discriminates college samples who met some of the criteria for GAD, from those who met the full diagnostic criteria for GAD or PTSD (Meyer et al., 1990). Correlations between the PSWQ and measures of anxiety, depression, cognitive and emotional factors in both clinical and non-clinical sample support the discriminant validity of the measure (Brown et al., 1992; Roemer, Salters, Raffa & Orsillo, 2005). A two factor solution has been proposed, but what was most noticeable about the factors was that one consisted of all the reverse score items (Fresco, Heimberg, Mennin & Turk, 2002), a common outcome in the psychometric evaluation of psychological tests (Brown,

2003). Further analysis of the factor structure taking this methodological concern into consideration confirmed that a one factor solution is the best fit for the data, with the two proposed factors having a high correlation (0.87), further confirming the unsuitability of having two separate factors (Brown, 2003).

The *Intolerance of Uncertainty Scale (IUS)* (Buhr & Dugas, 2002; Freeston et al., 1994) comprises 27 items scored on a 5 point likert scale. It assesses emotional, cognitive and behavioural reactions to ambiguous situations, implications of being uncertain, and attempts to control the future (Freeston et al., 1994). Although multifactor solutions have been proposed (Sexton & Dugas, 2009), these have been shown to be unreliable across different groups, including those of different ethnicities (Norton, 2005), and a single factor is most commonly used. The single factor has excellent internal consistency, $\alpha = .94$, good test-retest reliability over 5 weeks $\alpha = .74$ (Buhr & Dugas, 2002), and has demonstrated convergent and discriminant validity across a wide range of cognitive and emotional measures (Boelen & Reijntjes, 2009; Buhr & Dugas, 2006; Dugas et al., 2004), with similar scores across different racial groups (Norton, 2005). A shortened version of the IUS has been developed, which shows superior fit to the data than the 27 item version, especially for a two factor solution (Carleton, Norton & Asmundson, 2007). The two factors are *Prospective Anxiety (IUS-PA)* and *Inhibitory Anxiety (IUS-IA)*. The shortened version shows good convergent and discriminant validity, adequate internal consistency, $\alpha = .72$ to .89 for factor 1 and $\alpha = .83$ to .86 for factor 2, and test-retest reliability over 2 weeks of $r = .77$ (Khawaja & Yu, 2010; Nicholas Carleton, Sharpe & Asmundson, 2007). Compared to other versions of the IUS, the two factor 12 item version is the best fitting model (McEvoy & Mahoney, 2011), and is therefore the preferred version for the present research.

The *Anxious Thoughts Inventory (AnTI)* (Wells, 1994) is a measure of 22 items scored on a 4 point likert scale. It consists of three subscales measuring different aspects of worry; two content related dimensions (health worry and social worry) and one process worry dimension (metaworry) (de Bruin et al., 2007). The subscales show good reliability with a stable factor structure, internal consistency ranging from $\alpha = .75$ to .84, and test-retest reliability over 6 weeks of .77 (Wells, 1994). It has good evidence of divergent and discriminant validity with subscales showing expected correlations with other cognitive variables (de Bruin et al., 2007; Wells & Carter, 1999). This measure was chosen as it specifically measures metaworry, considered to be a feature specific to anxiety disorders in the metacognitive model of GAD (Wells, 1999).

4.3. Results

Missing data.

A significant number of internet participants did not complete the questionnaires, a majority either clicking the link but not providing any responses, or not responding to any questions after the demographic information page. Of the 468 who proceeded to answering questions, 32 were excluded from the analysis due to only responding to a few of the measures. Completion of the first three measures was required for participants to be included in the analysis. Once these participants had been excluded, the presence of incomplete data for the remainder of the samples was minimal. There was a missing data rate of approximately 0.2% for each sample, i.e., approximately one missing response for every four respondents. For the student sample one student had a significant number of missing items, including 13 on the ERI-E, so was excluded from further analysis. Another student did not fill in the middle pages of the handout, so he did not have scores recorded for the DASS-21 and DAS-A-17.

A number of considerations were taken into account to deal with the missing data. As the missing data occurred across a significant number of respondents, with few respondents missing more than 2 items, and as the percentage of missing data was so low, single imputation was used as this is a better option than case deletion, and replacing missing data with the mean for that particular item has a minimal effect on estimates (Schafer & Graham, 2002), meaning more complicated methods of replacing missing data is not necessary.

Outliers.

There were no univariate outliers detected, with all items scoring the full range of responses. Further testing for bivariate and multivariate outliers was undertaken to determine any outliers to be excluded on this basis. This consisted of calculating Mahalanobis distances for the items that loaded onto each scale, and the scales which loaded onto the overall measures. Bivariate outliers were analysed for each pair of questionnaires used in the research. On this basis only one respondent was deleted for the internet sample due to a high mahalanobis distance score (which was due to a majority of responses being either 1 or 5 on the ERI-E), and none from the student sample.

4.3.1. Comparison of Samples

Given the different data collection methods (including within the internet sample), descriptive statistics were calculated and compared, and are shown in Table 53. The age difference between the student and internet samples was not able to be statistically determined (due to internet sample data being collected in age bands, not exact age), but 76% of the internet sample, and 96% of the student sample was aged under 40, indicating a significant difference in age.

Table 53
Descriptive statistics and comparisons between samples

					Internet sample			
	Internet	Student	*F*	*p*	United States	New Zealand	*F*	*p*
Age (% under 40)	76%	96%			84%	58%	21.12	.000
Gender (% female)	80%	84%	1.12	.276	78%	85%	.95	.389
% with tertiary qualification	37%	25%	10.18	.001	23%	71%	36.77	.000
% having children	31%	9%	35.91	.000	34%	34%	.97	.379
% living in cities (population over 100,000 people)	32%	32%	.00	.999	30%	59%	12.89	.000

There are significant differences between the groups. The student sample is younger, less likely to have a tertiary level qualification, and less likely to have children than the internet sample. Within the internet sample (amongst the participants able to be identified as being from either the United States or New Zealand) New Zealand participants were older, more likely to be from a larger centre, and more likely to have a tertiary level qualification. This is most likely due to the different internet sites used to collect these participants. However, splitting the internet sample into subgroups was difficult due to the factors mentioned earlier in regards to responses to the question regarding nationality. For this reason the sample will be treated as one, in spite of the limitation of differences between the participants. Important socio-demographic (and other) variables that differ between groups will be taken into account, and statistically controlled for where possible and necessary.

4.3.2. Factor Structure of the DAS-A-17

A lack of research with the two factor 17 item DAS (DAS-A-17), and the instability in the number of factors for the 40 item DAS in previous research (de Graaf et al., 2009) means that before using this measure the appropriate factor structure needed to be determined. The initial step was to confirm the suitability of the items for use in a CFA analysis, and then to conduct the analysis on the one and two factor models used in the original research with the DAS-A-17. This will be undertaken with the two samples collected. Although results in Table 53 show the New Zealand and United States participants to be distinctly different on some socio-

demographic factors, the number of United States participants is too small for a CFA analysis, so the internet sample will be treated as one sample. Given this limit the primary analysis will be the student sample, although the size of this sample is just above the minimum size that is suitable for CFA analysis (Kline, 2011).

4.3.2.1. DAS-A-17 item analysis.

Individual item analysis was undertaken in order to identify items that did not meet the normal distribution requirements for both explanatory and confirmatory factor analysis. The values are presented in Table 54 for the student sample and Appendix J for the internet sample.

Table 54
Descriptive statistics for items of the DAS-A-17 for student sample (n=203)

Item	Minimum	Maximum	*M*	*SD*	Skewness	Kurtosis
DAS1	1	7	5.78	1.478	-1.220	.543
DAS2	1	7	5.00	1.646	-.524	-.810
DAS3	1	7	6.15	1.234	-1.690	2.496
DAS4	1	7	5.31	1.691	-.814	-.393
DAS5	1	7	5.38	1.746	-.906	-.345
DAS6	2	7	5.16	1.553	-.498	-.944
DAS7	3	7	5.86	1.139	-.944	.183
DAS8	1	7	5.72	1.454	-1.228	.849
DAS9	1	7	5.28	1.786	-.812	-.524
DAS10	1	7	4.73	1.815	-.305	-1.210
DAS11	1	7	4.79	1.820	-.430	-.975
DAS12	1	7	5.57	1.538	-.967	-.084
DAS13	1	7	2.16	1.353	1.543	2.346
DAS14	1	7	3.31	1.622	.577	-.373
DAS15	1	7	4.81	1.711	-.296	-1.075
DAS16	1	7	4.98	1.735	-.596	-.630
DAS17	1	7	3.80	1.680	.391	-.791

The criteria for eliminating items due to high level of non-normality are a skewness value greater than 2 and kurtosis value greater than 7 (West et al., 1995). As no items exceeded the cutoff for skewness or kurtosis for the student sample, and the highest skewness value was only just above the cutoff limit for the internet sample, all items were left in for use in the initial CFA analysis.

4.3.2.2 CFA of DAS-A-17.

Confirmatory factor analysis was run using the same models used for previous research with the DAS-A-17, one and two factor models (de Graaf et al., 2009), which are shown in Appendix J. The fit indices for the models (for both samples) are shown in Table 55.

The two factor model was a better fit for the data for both samples. The fit is poor for the one factor model, and moderate for the two factor model. The factor loadings for the two factor model are shown in Table 56, for the student sample. The other factor loadings are shown in Appendix J. The correlation between the two factors was 0.69 for the student sample and 0.79 for the internet sample.

All factor loadings are above 0.3, and almost all are over 0.5, indicating all items load adequately onto the scale they were expected to load onto. The reliabilities for the factors are shown in Table 57, and show good reliability for all scales. All these results indicate that a two factor solution provides an adequate fit for the data, and is preferable to a single factor solution.

Table 55
CFA fit indices results for different models of the DAS-A-17

Model	χ^2	*df*	CFI	TLI	RMSEA
One factor model – student sample	407	119	0.80	0.77	0.109
Two factor model – student sample	282	118	0.88	0.87	0.083
One factor model – internet sample	781	119	0.83	0.81	0.113
Two factor model – internet sample	548	118	0.89	0.88	0.091

Table 56
Factor loadings - Two factor DAS-A-17 model for student sample

Item	Scale	Unstandardised	Standardised
DAS1	Perfectionism	0.771	0.552
DAS2	Perfectionism	1.164	0.749
DAS3	Perfectionism	0.586	0.503
DAS4	Perfectionism	1.308	0.819
DAS5	Perfectionism	1.427	0.865
DAS6	Perfectionism	0.846	0.577
DAS7	Perfectionism	0.533	0.495
DAS8	Perfectionism	1.015	0.739
DAS9	Perfectionism	1	0.593
DAS11	Perfectionism	1.099	0.639
DAS12	Perfectionism	0.849	0.584
DAS10	Dependency	1	0.749
DAS13	Dependency	0.363	0.365
DAS14	Dependency	0.679	0.569
DAS15	Dependency	0.875	0.695
DAS16	Dependency	0.824	0.645
DAS17	Dependency	0.905	0.732

Table 57
Internal consistency of DAS-A-17 scales

Factor	Student	Internet
Perfectionism	.89	.91
Dependency	.80	.83
Dysfunctional Attitudes	.91	.93

4.3.3. Normality Assumptions

Individual item analysis was undertaken prior to the data analysis, in order to identify items that did not meet the normal distribution requirements for CFA. Descriptive statistics for all measures used in this research are shown in Appendix K (for both samples), and indicate all measures have approximately normal distributions. The values for skewness and kurtosis for the measures was within acceptable limits, and all measures had scores covering almost the full range of possible values. High values for kurtosis for the DASS-21 scales is expected as these are measuring a level of pathology, and significantly higher numbers of people are expected to score in the normal range compared to the severe range. The skewness and kurtosis values for health worries are substantially higher for the student sample, reflecting the low scores given on this scale by this population. The internal consistency values are lower than 0.7 for a number of the ERI-E domains, particularly for the student population, with the risks to belongings domain being the only one below 0.6. This reflects a lack of reliability for this scale in particular, but also for the individual domain scales in general, consistent with results from Chapter 3.

4.3.4. Correlations

4.3.4.1. Socio-demographic factors.

To determine the important socio-demographic factors that need to be taken into account in analysing results, the correlations between socio-demographic variables and other variables used in this section of research were calculated and are shown in Table 58 for the internet sample, and Table 59 for the student sample.

Age has the highest correlations with the measures used in these samples, for most scales. The population where people live generally only has significance with some aspects of everyday risk taking, but this is not consistent across the two samples, with some significant positive and negative correlations. Females are more risk averse for both samples, but this is particularly the case in the student sample. High correlations between qualification and the psychometric measures in the student sample should be treated with caution, as only 25% of the population has a tertiary level qualification, and the correlation with age is 0.50. Age and qualification have similar correlations with the psychometric measures. It is important to note the low levels of correlations generally, even the highest correlation (between age and risks involving personal danger) only explains 8.5% of the variation in scores on this scale. Given the inconsistent results across samples and different aspects of everyday RTB, and low levels of variance explained by these correlations, no socio-demographic variables will be controlled for in further statistical analyses. Given the samples in this study are more similar to the student sample in the first study than the community sample, this is consistent with the approach used for study 1.

Table 58
Correlations between socio-demographic variables and psychometric measures for internet sample

	Age	Gender	Qualification	Children	Population
Risks to belongings	-0.038	-0.013	0.069	-0.102*	-0.067
Unknown risks	-0.030	-0.081	-0.110*	0.050	0.028
Health risks	-0.010	-0.196**	-0.025	0.039	0.076
Risks involving personal danger	-0.165**	-0.103*	0.074	0.117*	0.087
Risks to others	0.021	-0.112*	-0.134**	0.136**	0.147**
Social risks	-0.072	-0.101*	-0.046	0.087*	0.147**
Everyday risks	-0.064	-0.130*	-0.031	0.065	0.083
Anxiety Level	-0.221**	0.027	0.224**	0.064	-0.102*
Depression Level	-0.094	0.029	0.089	0.042	-0.009
Stress Level	-0.167**	0.107*	0.183**	-0.004	-0.078
GSD	-0.182**	0.076	0.194**	0.038	-0.105*
DAS Perfectionism	.154**	-.080	-.015	-.013	-.032
DAS Dependency	.189**	-.163**	-.022	-.052	-.064
DAS-A-17	0.179**	-0.117*	-0.019	-0.028	-0.046
PSWQ	-0.189**	0.158**	0.169*	-0.075	-0.114*
IUS - PA	-.026	.082	.032	-.101*	-.001
IUS - IA	-.066	.100*	.047	-.063	-.034
IUS	-0.048	0.096*	0.042	-0.089	-0.017
AnTI Social worry	-0.244**	0.103*	0.094*	0.064	-0.048
AnTI Metaworry	-0.142**	0.042	0.077	-0.087	-0.077
AnTI Health worry	-0.222**	0.066	0.123*	0.024	-0.049
AnTI Total	-0.236**	0.084	0.112*	0.012	-0.063

* Significant at 0.05, ** significant at 0.01

Table 59
Correlations between socio-demographic variables and psychometric measures for student sample

	Age	Gender	Qualification	Children	Population
Risks to belongings	-.195**	-.157*	.187**	.077	-.148*
Unknown risks	-.071	-.047	.058	.116	-.053
Health risks	-.201**	-.293**	.162*	.107	-.128
Risks involving personal danger	-.291**	-.207**	.265**	.125	-.025
Risks to others	-.095	-.244**	.130	.060	-.016
Social risks	-.079	-.032	.211**	.059	.082
Everyday risks	-.207**	-.213**	.221**	.121	-.065
Anxiety Level	-.092	.120	.115	.085	.051
Depression Level	-.086	-.023	.089	-.015	.084
Stress Level	.023	.103	-.001	-.100	.081
GSD	-.032	.055	.040	-.036	.079
DAS Perfectionism	.048	-.012	-.069	.075	-.019
DAS Dependency	.090	-.105	-.015	.078	-.123
DAS-A-17	.063	-.052	-.054	.084	-.041
PSWQ	-.061	.214**	-.003	-.023	-.017
IUS - PA	-.098	.055	.037	.030	-.008
IUS - IA	-.042	.054	-.025	-.018	-.002
IUS	-.012	.059	.009	-.013	.010
AnTI Social worry	-.186**	.126	.137	.045	-.011
AnTI Metaworry	-.121	.039	.067	.045	.028
AnTI Health worry	-.141*	.164*	.139*	.101	.043
AnTI Total	-.180*	.125	.134	.070	.018

* Significant at 0.05, ** significant at 0.01

4.3.4.2. Psychometric measures.

The correlations between the psychometric measures used in this research are shown in Table 60 for the student sample, and in Table 61 for the internet sample. These correlations show the most significant correlations between everyday risk measures and cognitive factors to be for the PSWQ and the IUS (particularly the prospective anxiety scale) in both samples, as was hypothesised. This result is more consistent across everyday RTB domains in the student sample. Individual domains of everyday risk taking have significant correlations with other cognitive measures, social risk taking with the DAS-A-17 scales and the AnTI social worry scales for instance. The correlations between the two scales measuring social factors were significant for both groups, but not higher than the correlations of other ERI-E domains with the AnTI social worry scales, so the hypothesis that the these two scales would be highly correlated was not supported. The ERI-E health risks scale had the expected higher correlation with the AnTI health worry scale for the student sample, but not the internet sample, so the hypothesis regarding these scales was partially supported. Unknown risks had significant correlations with IU, higher than for other ERI-E domains, which supports the hypothesis that IU and unknown risks would be highly correlated. Generally the correlations for the student sample are higher than for the internet sample, although the patterns of results are similar.

4.3.4.3. Mediating effects of anxiety level on the relationship between cognitive factors and everyday RTB.

The correlations between anxiety level and everyday risk scores are higher for this stage of the research that for the previous stage, particularly for the student sample. As stated in the introduction to this section, this means it is possible that cognitive factors mediate the relationship between everyday RTB (outcome variable) and anxiety level (independent variable), in the student sample particularly. To determine if this is the case, structural equation modelling will be used to determine the significance of the anxiety level – RTB relationship once the affects of cognitive factors are taken into account. This will determine the suitability of the proposed model, shown in Figure 7 and the direct and indirect effects of the factors in the model.

Direct effects are the observed relationships between each factor in the model. The indirect effects are those explained by mediated pathways in the model. In this case indirect effects would be those explained in the mediated pathway between cognitive factors and RTB, via anxiety level (the mediator). The combination of the direct and indirect effects is the total effect.

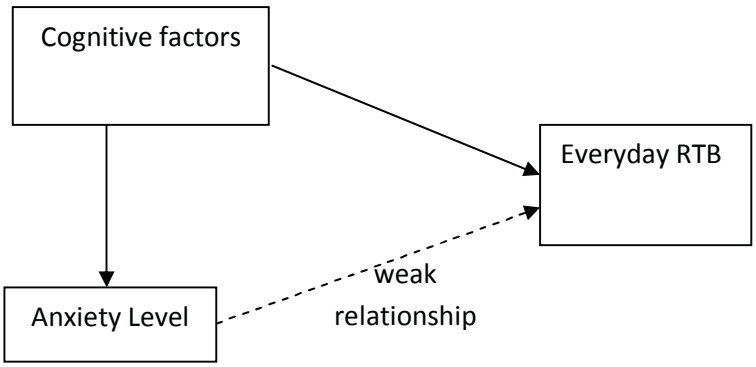

Figure 7: Model being used in structural equation modelling to test mediating effects of anxiety level on the relationship between cognitive factors and everyday RTB.

Due to the large number of different types of everyday RTB and cognitive measures used in the analysis, those selected for testing this model were the cognitive measures with high correlations with RTB scales (the PSWQ and the IUS), and the everyday risks score. The results of the analysis are shown in Figure 8.

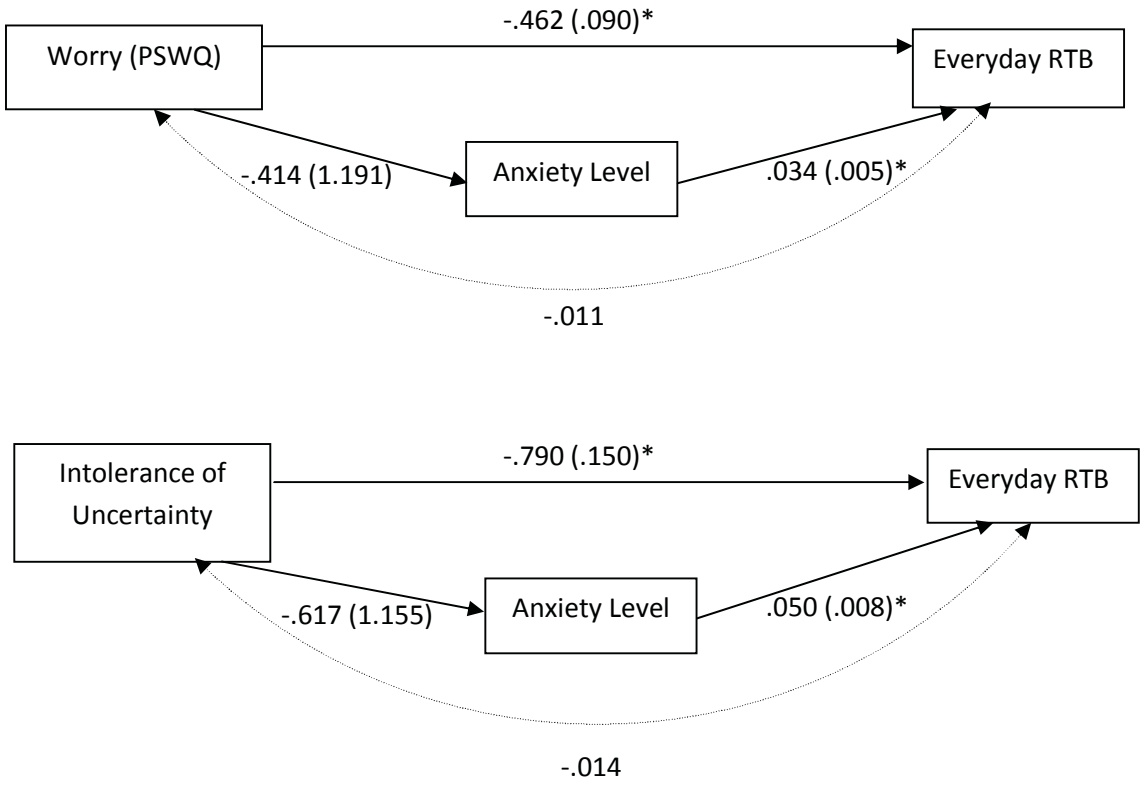

Figure 8: Effects of anxiety level on the relationship between cognitive factors and everyday RTB. Unstandardized regression coefficients are shown, and standard errors are given in parentheses, apart from indirect effect (dotted line), which is standardised. Asterisks indicate significant coefficients ($p < .01$).

Table 60
Correlations between psychometric measures for student sample

	Anxiety Level	Depression Level	GSD	DAS Perfection	DAS Depend	DAS-A-17	PSWQ	IUS - PA	IUS - IA	IUS	AnTI Social worry	AnTI Meta-worry	AnTI Health worry	AnTI Total
Risks to belongings	-.198**	-.145*	-.222**	.229**	.154*	.222**	-.325**	-.319**	-.284**	-.322**	-.227**	-.240**	-.114	-.238**
Unknown risks	-.124	-.111	-.161*	.258**	.150*	.240**	-.301**	-.356**	-.248**	-.343**	-.264**	-.175*	-.155*	-.243**
Health risks	-.205**	-.157*	-.231**	.102	.100	.112	-.356**	-.270**	-.228**	-.275**	-.158*	-.171*	-.243**	-.216**
Risks involving personal danger	-.182**	-.120	-.211**	.165*	.066	.142*	-.296**	-.286**	-.267**	-.300**	-.224**	-.224**	-.239**	-.267**
Risks to others	-.082	-.076	-.109	.015	.005	.012	-.166*	-.206**	-.106	-.182**	-.110	-.121	-.102	-.131
Social risks	-.016	-.034	-.067	.191**	.221**	.223**	-.226**	-.302**	-.288**	-.327**	-.215**	-.124	-.106	-.184**
Everyday risks	-.180*	-.142	-.222**	.213**	.152*	.210**	-.369**	-.382**	-.313**	-.384**	-.264**	-.232**	-.215**	-.283**
Anxiety Level		.552**		-.431**	-.320**	-.430**	.431**	.355**	.359**	.383**	.527**	.529**	.385**	.578**
Depression Level				-.512**	-.369**	-.507**	.403**	.272**	.394**	.342**	.574**	.596**	.347**	.615**

* Significant at 0.05, ** significant at 0.01

Table 60 cont.

	Anxiety Level	Depression Level	GSD	DAS Perfection	DAS Depend.	DAS-A-17	PSWQ	IUS - PA	IUS - IA	IUS	AnTI Social worry	AnTI Meta-worry	AnTI Health worry	AnTI Total
GSD				-.570**	-.463**	-.585**	.611**	.465**	.507**	.521**	.660**	.714**	.422**	.725**
DAS Perfection.					.618**		-.455**	-.484**	-.518**	-.539**	-.663**	-.565**	-.300**	-.633**
DAS Depend.							-.445**	-.423**	-.433**	-.463**	-.548**	-.460**	-.310**	-.539**
DAS-A-17							-.498**	-.509**	-.537**	-.563**	-.684**	-.580**	-.335**	-.659**
PSWQ								.573**	.593**	.631**	.652**	.691**	.394**	.704**
IUS - PA									.717**		.626**	.588**	.288**	.621**
IUS - IA											.663**	.615**	.315**	.657**
IUS											.654**	.601**	.303**	.643**
AnTI Social worry												.768**	.440**	
AnTI Metaworry													.450**	

* Significant at 0.05, ** significant at 0.01

Table 61

Correlations between psychometric measures for internet sample

	Anxiety Level	Depression Level	GSD	DAS Perfection.	DAS Depend	DAS-A-17	PSWQ	IUS - PA	IUS - IA	IUS	AnTI Social worry	AnTI Meta-worry	AnTI Health worry	AnTI Total
Risks to belongings	-.046	.027	.013	-.017	-.099*	-.049	.002	-.073	-.071	-.077	.035	-.034	-.013	.001
Unknown risks	-.104*	-.003	-.059	.099*	.064	.094	-.145**	-.270**	-.190*	-.249**	-.060	-.088	-.060	-.076
Health risks	-.079	.063	-.012	-.032	-.009	-.026	-.097*	-.129**	-.103*	-.125**	.030	-.056	.014	.002
Risks involving personal danger	-.034	.105*	.045	-.075	-.121**	-.098	.007	-.128**	-.078	-.112*	.121*	.002	.051	.075
Risks to others	-.100*	.046	-.070	-.041	-.077	-.057	-.156**	-.095*	-.052	-.080	.033	.007	-.057	-.004
Social risks	-.094*	-.045	-.067	.157**	.099*	.148**	-.188**	-.160**	-.202**	-.192**	-.107*	-.060	-.064	-.091
Everyday risks	-.096*	.044	-.028	.015	-.034	-.002	-.117*	-.182**	-.148**	-.178**	.015	-.049	-.024	-.017
Anxiety Level		.522**		-.378**	-.272**	-.368**	.493**	.386**	.494**	.466**	.489**	.447**	.600**	.578**
Depression Level				-.462**	-.390**	-.471**	.456**	.343**	.483**	.436**	.585**	.364**	.623**	.607**

* Significant at 0.05, ** significant at 0.01

Table 61 cont.

	Anxiety Level	Depression Level	GSD	DAS Perfection.	DAS Depend	DAS-A-17	PSWQ	IUS - PA	IUS - IA	IUS	AnTI Social worry	AnTI Meta-worry	AnTI Health worry	AnTI Total
DAS Perfection.					.693**		-.434**	-.467**	-.527**	-.529**	-.684**	-.384**	-.569**	-.637**
DAS Depend.							-.454**	-.362**	-.437**	-.424**	-.668**	-.317**	-.487**	-.580**
DAS-A-17							-.475**	-.464**	-.534**	-.531**	-.731**	-.389**	-.583**	-.665**
PSWQ								.577**	.619**	.637**	.632**	.455**	.661**	.669**
IUS - PA									.751**		.524**	.428**	.554**	.572**
IUS - IA											.638**	.441**	.686**	.676**
IUS											.616**	.464**	.658**	.663**
AnTI Social worry												.563**	.809**	
AnTI Metaworry													.631**	

* Significant at 0.05, ** significant at 0.01

These results show that anxiety level does not have a significant impact on everyday RTB, once the effects of the relationship between cognitive factors and everyday risks are taken into account. Similar results were found for both the IUS and PSWQ, which may indicate the effect may occur for other cognitive factors (e.g. other types of worry). The indirect effect of cognitive factors on everyday risks is very low. To test the suitability of a model with cognitive factors affecting both everyday risks and anxiety level, fit statistics were calculated for this model (shown in Figure 7, without the weak relationship shown).

Results of the SEM analyses (using the student sample) showed that the model was an excellent fit for the data for both the PSWQ ($\chi^2 = 1.21$, $df = 1$, $p = .728$, CFI = 1.00, TLI = 1.04, RMSEA = .000) and the IUS ($\chi^2 = .285$, $df = 1$, $p = .593$, CFI = 1.00, TLI = 1.04, RMSEA = .000). The conclusion is therefore that cognitive factors affect everyday RTB and anxiety level, and there is no direct relationship between anxiety level and everyday RTB. The similarity of the results indicates this model applies to cognitive factors in general, rather than IU or worry specifically.

4.3.5. International Comparison

To determine the generalisability of these results, and to determine any international differences a comparison is made between the New Zealand (combined from student and internet samples) and the United States participants (those able to be definitively identified as being from those countries). The socio-demographic characteristics of these groups are shown in Table 53. To determine differences in scores on each measure an ANOVA was conducted on the two groups, and the results are shown in Table 62.

These results show significant differences in scores on almost all measures between the two nationalities. New Zealand participants are more risk taking on almost all scales of the ERI-E (except for risks to belongings), and have significantly lower levels of depression, anxiety and general psychological distress. Cognitive measures show that in general the New Zealand sample has less worry, intolerance of uncertainty, and dysfunctional attributions (particularly perfectionism), with a particularly strong affect for health worries. There is no difference between the groups in metaworry scores however.

There are significant differences in socio-demographic variables between the groups (see Table 53) and this may explain some of the differences in scores. For instance the everyday RTB scores were shown to have strong relationships to socio-demographic factors (age and income in particular) in the previous chapter of this research. There are significantly higher depression and anxiety level scores for the United States participants, and these are highly correlated with the

Table 62
Differences between means of New Zealand and United States participants

Measure	United States (143 participants		New Zealand (317 participants)			
	M	*SD*	*M*	*SD*	*F*	*p*
Risks to belongings	18.17	5.25	18.67	4.05	1.259	.262
Unknown risks	18.56	4.49	20.84	4.43	25.951	.000
Health risks	15.43	5.09	18.30	4.40	37.880	.000
Risks involving personal danger	16.87	4.62	18.85	4.56	18.682	.000
Risks to others	10.94	3.81	13.95	3.66	65.412	.000
Social risks	16.55	4.11	18.29	3.91	18.856	.000
Everyday risks	96.52	20.97	108.90	19.36	38.403	.000
Anxiety Level	2.46	27.71	1.88	25.00	22.715	.000
Depression Level	2.39	1.26	1.83	1.20	22.371	.000
GSD	44.98	1.28	31.37	1.14	27.268	.000
DAS Perfectionism	53.83	15.24	57.72	13.71	7.415	.007
DAS Dependency	23.41	8.30	23.60	7.40	.064	.801
DAS-A-17	77.23	21.89	81.33	19.30	4.069	.044
PSWQ	58.43	15.28	51.33	14.46	22.923	.000
IUS-PA	22.76	6.15	19.49	5.62	16.060	.000
IUS-IA	13.38	5.54	11.55	4.31	9.437	.000
IUS	36.14	11.03	31.02	9.29	26.420	.000
AnTI Social worry	21.91	7.15	19.63	6.29	11.947	.001
AnTI Metaworry	12.50	4.83	12.50	4.58	.000	.997
AnTI Health worry	16.45	5.69	11.66	5.03	41.229	.000
AnTI Total	50.86	15.49	43.79	13.42	36.799	.000

cognitive variables (see Table 61) which may explain the differences in everyday RTB scores between the two groups. Correlations were calculated for the United States sample (Table 64), and for the New Zealand sample (Table 65).

There are differences in the patterns of correlations for the United States and New Zealand samples. There are few significant correlations between ERI-E measures and other measures for the United States population, whereas for the New Zealand samples there are many significant correlations, and almost all correlations are in the expected direction.

The cognitive factor having the highest correlation with ERI-E measures for participants from both countries is IU, but this only reaches the level of being statistically significant for social risk taking in the United States sample. Metaworry has the second highest correlations of the cognitive factors in the United States sample, even though it is lower than the corresponding correlations for the New Zealand student sample. The relationship between metaworry and risks to belongings scores was high for both the United States and New Zealand student samples, but not for the internet sample as a whole. Although the smaller sample size means that larger correlations are required to reach statistical significance, the magnitude of correlations is also less for the United States participants compared to the New Zealand participants. This means that the smaller sample had little impact on whether statistically significant results were obtained. Given the differences between the samples further analysis was conducted to determine if the difference in scores on DASS-21 measures was a significant factor. Analysis was undertaken based on anxiety levels, as this was the main DASS-21 scale of interest in this section of research.

4.3.6. Post-Hoc Analysis: Different Anxiety Levels

Given the strong relationship between anxiety level and cognitive variables, and between everyday RTB and cognitive variables, an analysis was undertaken to determine if the relationship between cognitive variables and everyday RTB was similar at different levels of anxiety. For example, is the relationship between RTB and cognitive variables stronger for moderately anxious people compared to those with mild levels of anxiety.

Initially an analysis of the differences in scores on cognitive and risk taking measures for different anxiety levels was conducted (Table 63), with the full results of the analysis shown in Appendix L. Anxiety level is scored from 1 for normal anxiety, up to 4 for severe anxiety. The combined sample is used in order for there to be sufficient numbers at each anxiety level to detect moderate differences between groups (Cohen, 1992).

Table 63
ANOVA of scores for measures for different levels of anxiety (combined sample)

	M (SD) for different anxiety levels					
	Normal (n=300)	Mild (n=48)	Moderate (n=126)	Severe (n=164)	*F*	*p*
Risks to belongings	18.90 (4.23)	17.92 (4.59)	17.93 (4.90)	17.80 (4.85)	2.739	.043[1]
Unknown risks	20.51 (4.66)	20.10 (4.39)	19.10 (4.15)	18.74 (4.72)	6.400	.000[1]
Health risks	17.90 (4.87)	17.19 (4.92)	16.18 (4.45)	16.07 (5.13)	6.583	.000[1]
Risks involving personal danger	18.60 (4.69)	18.67 (4.84)	17.45 (4.58)	17.24 (4.92)	3.907	.009[1]
Risks to others	13.33 (4.01)	12.60 (4.11)	11.97 (3.53)	11.93 (3.98)	6.115	.000[1]
Social risks	17.79 (4.09)	17.50 (3.56)	16.97 (3.64)	16.63 (4.25)	3.307	.020[2]
Everyday risks	107.02 (21.18)	103.98 (19.30)	99.60 (18.57)	98.42 (22.16)	7.532	.000[1]
DAS-A-17	87.49 (16.51)	79.94 (19.94)	75.86 (20.36)	67.83 (20.58)	41.281	.000[3]
PSWQ	47.39 (14.15)	57.92 (13.63)	59.65 (12.74)	65.82 (10.80)	77.581	.000[3]
IUS	28.52 (8.52)	32.02 (9.72)	35.92 (9.12)	40.45 (9.86)	65.293	.000[4]
AnTI Social worry	17.30 (5.44)	21.50 (6.62)	22.83 (6.14)	25.59 (5.79)	79.965	.000[3]
AnTI Metaworry	10.45 (3.48)	12.23 (4.76)	12.90 (4.65)	15.20 (4.77)	46.541	.000[3]
AnTI Health worry	10.73 (4.07)	13.77 (3.99)	15.59 (5.60)	19.05 (5.29)	114.899	.000[4]
AnTI	38.49 (10.62)	47.50 (12.83)	51.33 (12.98)	59.84 (12.46)	122.996	.000[4]

[1]Normal significantly different to moderate and severe.

[2]Normal and severe significantly different.

[3]Normal significantly different to all other levels; severe significantly different to all other levels.

[4]Differences significant for all levels.

Scores on all measures differ significantly for different levels of anxiety. The levels that are most similar are mild and moderate, where differences only exist for the IUS and the health worry and overall scale of the AnTI. The scores for all measures are significantly different between normal and severe anxiety levels, and for all but the social risk taking scale of the ERI-E for normal and moderate levels. For all measures the mean score shows a regular pattern of increasing or decreasing as anxiety levels increase, indicating a linear pattern of relationship between anxiety level and measures of RTB, and of cognitive dysfunction. This supports the

Table 64

Correlations between psychometric measures for United States sample

	Anxiety Level	Depression Level	GSD	DAS Perfection.	DAS Depend	DAS-A-17	PSWQ	IUS - PA	IUS - IA	IUS	AnTI Social worry	AnTI Meta-worry	AnTI Health worry	AnTI Total
Risks to belongings	-.112	-.064	-.034	.059	-.097	.004	-.040	-.074	-.086	-.084	.021	-.194*	-.045	-.068
Unknown risks	-.063	.083	.032	-.004	-.061	-.026	-.014	-.160	-.062	-.121	.055	-.086	.091	.032
Health risks	-.060	.064	.028	-.045	-.059	-.054	-.035	-.107	-.107	-.113	.069	-.118	.118	.039
Risks involving personal danger	.030	.131	.133	-.136	-.223**	-.179*	.030	-.091	-.042	-.071	.174*	-.034	.116	.112
Risks to others	-.120	.061	-.013	-.006	-.139	-.057	-.161	-.138	-.052	-.103	.023	-.088	-.108	-.057
Social risks	-.105	-.065	-.052	.180*	.081	.156	-.175*	-.154	-.255	-.214*	-.098	-.105	-.023	-.087
Everyday risks	-.092	.044	.022	.007	-.110	-.037	-.078	-.154	-.129	-.151	.057	-.140	.038	-.003
Anxiety Level		.501**		-.391**	-.266**	-.373**	.421**	.415**	.481**	.473**	.461**	.489**	.524**	.558**

* Significant at 0.05, ** significant at 0.01

Table 64 cont.

	Anxiety Level	Depression Level	GSD	DAS Perfection.	DAS Depend	DAS-A-17	PSWQ	IUS - PA	IUS - IA	IUS	AnTI Social worry	AnTI Meta-worry	AnTI Health worry	AnTI Total
Depression Level				-.529**	-.392**	-.517**	.403**	.374**	.511**	.466**	.565**	.296**	.593**	.571**
GSD				-.486**	-.361**	-.475**	.488**	.486**	.586**	.565**	.575**	.404**	.660**	.634**
DAS Perfection.					.704**		-.390**	-.535**	-.564**	-.582**	-.723**	-.337**	-.568**	-.648**
DAS Depend.							-.432**	-.369**	-.499**	-.456**	-.713**	-.297**	-.462**	-.592**
DAS-A-17							-.435**	-.512**	-.582**	-.578**	-.774**	-.348**	-.571**	-.675**
PSWQ								.602**	.634**	.655**	.603**	.457**	.616**	.647**
IUS - PA									.778**		.585**	.420**	.613**	.627**
IUS - IA											.674**	.398**	.694**	.690**
IUS											.665**	.435**	.690**	.696**
AnTI Social worry												.522**	.785**	
AnTI Metaworry													.601**	

* Significant at 0.05, ** significant at 0.01

Table 65
Correlations between psychometric measures for New Zealand sample

	Anxiety Level	Depression Level	GSD	DAS Perfection.	DAS Depend	DAS-A-17	PSWQ	IUS - PA	IUS - IA	IUS	AnTI Social worry	AnTI Meta-worry	AnTI Health worry	AnTI Total
Risks to belongings	-.177**	-.160**	-.200**	.156**	.101	.150**	-.252**	-.242**	-.253**	-.261**	-.207**	-.157**	-.166**	-.213**
Unknown risks	-.140*	-.151**	-.197**	.265**	.175**	.256	-.315**	-.397**	-.298**	-.384**	-.270**	-.099	-.219**	-.243**
Health risks	-.208**	-.130*	-.198**	.116*	.120*	.129*	-.315**	-.261**	-.225**	-.264**	-.170**	-.113*	-.247**	-.211**
Risks involving personal danger	-.183**	-.148**	-.195**	.109	.031	.089	-.256**	-.268**	-.256**	-.282**	-.180**	-.139*	-.271**	-.234**
Risks to others	-.132*	-.115*	-.159**	.076	.039	.069	-.187**	-.203**	-.164**	-.203**	-.137*	-.091	-.199**	-.170**
Social risks	-.063	-.109	-.121*	.242**	.234**	.261**	-.263**	-.244**	-.248**	-.268**	-.225**	-.116*	-.160**	-.205**
Everyday risks	-.197**	-.176**	-.232**	.209**	.151**	.206**	-.346**	-.352**	-.314**	-.362**	-.258**	-.155**	-.275**	-.277**
Anxiety Level		.568**		-.429**	-.299**	-.420**	.454**	.365**	.428**	.419**	.515**	.465**	.498**	.587**

* Significant at 0.05, ** significant at 0.01

Table 65 cont.

	Anxiety Level	Depression Level	GSD	DAS Perfection.	DAS Depend	DAS-A-17	PSWQ	IUS - PA	IUS - IA	IUS	AnTI Social worry	AnTI Meta-worry	AnTI Health worry	AnTI Total
Depression Level				-.511**	-.383**	-.510**	.460**	.363**	.467**	.435**	.588**	.480**	.532**	.639**
GSD				-.582**	-.438**	-.582**	.615**	.500**	.561**	.563**	.667**	.564**	.649**	.748**
DAS Perfection.					.639**		-.500**	-.503**	-.513**	-.543**	-.679**	-.445**	-.484**	-.651**
DAS Depend.							-.482**	-.438**	-.424**	-.464**	-.601**	-.414**	-.393**	-.570**
DAS-A-17							-.540**	-.525**	-.527**	-.564**	-.713**	-.475**	-.495**	-.681**
PSWQ								.627**	.622**	.673**	.682**	.598**	.555**	.731**
IUS - PA									.745**		.612**	.443**	.486**	.620**
IUS - IA											.630**	.481**	.507**	.649**
IUS											.662**	.488**	.523**	.672**
AnTI Social worry												.660**	.613**	
AnTi Metaworry													.382**	

* Significant at 0.05, ** significant at 0.01

results from the simple correlational analysis, where there were significant correlations between anxiety level and both cognitive and everyday RTB measures for at least one of the samples.

Further analysis was undertaken to determine whether there are significant differences in the relationship between risk taking and cognitive measures at different levels of anxiety. Comparisons were made between the correlations for different anxiety level scores, with the full results shown in Appendix M. Mild and moderate anxiety levels had similar scores on most everyday RTB and cognitive factor measures, so this comparison was of particular interest, as differences are unlikely to be related to differences in scores on any of the measures where correlations were compared. In other words, any differences in the correlations will not be due to differences in the level of either cognitive variables or everyday RTB scores. These differences are shown in Table 66.

Only 49 people were at mild level for anxiety which is below the 64 participants necessary to detect moderate differences between two groups with power of 0.8 (Cohen, 1992), so a further comparison was made between those scoring high (moderate and severe) and low (normal and mild) for anxiety to enable smaller differences to be detected, and the results are shown in Table 67. Correlation differences were calculated by subtracting the correlations found for participants at mild anxiety level from those at the moderate level, so a negative result means that moderate

Table 66
Differences in correlations between mild and moderate anxiety levels

	DAS-A-17	PSWQ	IUS	AnTI Social worry	AnTI Metaworry	AnTI Health worry	AnTI
Risks to belongings	0.17	-0.32*	-0.27	-0.12	-0.22	-0.15	-0.20
Unknown risks	0.34*	-0.32*	-0.21	-0.14	0.10	-0.13	-0.09
Health risks	0.22	-0.36*	-0.32*	-0.21	-0.18	-0.32*	-0.29
Risks involving personal danger	0.20	-0.32*	-0.22	-0.10	-0.23	-0.21	-0.21
Risks to others	0.00	0.04	0.05	0.00	-0.13	-0.15	-0.09
Social risks	0.34*	-0.36*	-0.27	-0.23	-0.34*	-0.15	-0.27
Everyday risks	0.29	-0.38*	-0.29	-0.18	-0.22	-0.26	-0.26

* Significant at 0.05

Table 67
Differences in correlations between low (normal and mild) and high (moderate and severe) anxiety levels

	DAS-A-17	PSWQ	IUS	AnTI Social worry	AnTI Metaworry	AnTI Health worry	AnTI
Risks to belongings	0.12	-0.21*	-0.13	-0.13	-0.10	-0.13	-0.15
Unknown risks	0.05	-0.09	-0.01	-0.13	0.00	-0.08	-0.09
Health risks	0.07	-0.26*	-0.10	-0.16	-0.04	-0.23*	-0.18*
Risks involving personal danger	0.06	-0.16*	-0.07	-0.12	-0.05	-0.19*	-0.14
Risks to others	-0.02	0.02	0.00	-0.04	-0.08	-0.12	-0.09
Social risks	0.09	-0.07	-0.08	-0.08	-0.22*	-0.04	-0.13
Everyday risks	0.08	-0.17*	-0.08	-0.14	-0.10	-0.17*	-0.17*

* Significant at 0.05

level anxiety participants had a higher value correlation than mild level participants (see Table 66)[6]. Significance was calculated by using Fishers r to z transformation to convert r values to z values, which were then compared to see if they were significantly different.

The results show that there are significantly different relationships between measures of everyday risk taking and cognitive factors depending on the level of anxiety. At lower levels of anxiety avoidance of everyday risk taking is affected by cognitive factors more than at higher levels of anxiety, particularly for worry (as measured by the PSWQ). This affect is particularly strong for risks involving health and personal danger, and minimal for risks involving other people. The relationship is particularly strong between mild and moderate levels of anxiety, with all correlations apart from those with risks to others being stronger for mild level anxiety. Even given the low numbers of people scoring at this level, many differences are statistically significant.

An example of the differences in the relationship between cognitive factors and everyday risks at different anxiety levels is that the correlation between the PSWQ and health risks is -.287 at mild anxiety level and .080 at moderate level. The correlation between DAS and unknown risks was 0.386 at mild anxiety level, and 0.050 at moderate level.

[6] Note that correlations between cognitive factors (apart from the DAS-A-17) and ERI-E measures are negative, so a negative value in tables 65 and 66 indicate a stronger relationship for mild/low anxiety levels.

4.4. Discussion

These results generally support the hypotheses for this section of the research (see Section 4.1.4), particularly for the New Zealand student sample (see Table 60)[7]. The primary hypothesis that participants with scores on measures of cognitive factors that indicate a level of cognitive dysfunction will be risk averse was generally supported. For the everyday risks scale the correlations were all highly significant, as were a majority of the scores for the individual domains. For the internet sample the relationship was not as strong (Table 61), but of the thirteen instances where correlations reached the level of statistical significance, 92% (12/13) were in the expected direction.

The correlation between cognitive measures and everyday RTB was expected to be strongest for intolerance to uncertainty (IU), and this was the case for both samples. For each sample the risk taking scale that had the highest correlation with IU was unknown risks, which was as hypothesised. People who are intolerant of uncertainty are likely to be avoidant of everyday risks, and this is particularly the case where the nature of the risk they are taking is unknown.

The hypothesis that worry (as measured by the PSWQ) would have the second highest correlation with risk taking measures was supported, with significant correlations with the everyday risks scale for both samples. Worry is the cognitive factor most associated with anxiety, and a feature of all the cognitive models of anxiety discussed in this section, and so was expected to have significant correlations. This provides some support to the hypothesis that risk avoidance is associated with cognitive factors leading to anxiety, as worry is considered in all models to predispose people to experiencing anxiety. Correlations between individual risk domains and worry differed depending on the sample, but were either close to zero, or in the expected direction, for all domains, with both samples. The strongest relationship for the student sample was for health risk and risks to belongings, whereas for the internet sample it was with risks to other and social risks. Unknown risks had significant relationships with worry for both samples, but of lower magnitude than other domains for both samples. This indicates the relationship of worry with everyday RTB occurs across most domains, and there is little domain specificity.

The hypothesis that dysfunctional schema (as measured by the DAS scales) would have the weakest relationship with everyday RTB was generally supported. For the internet sample the correlation between the DAS-A-17 and the everyday risks score was close to zero (Table 61),

[7] All research in this chapter advances research, and therefore will not be specifically mentioned in the discussion section.

and for the student sample had the lowest correlation of the cognitive measures, although it was of a similar value to the AnTI scales. The DAS perfectionism scale has slightly higher correlations than the DAS dependency scale in most instances. Social risk taking did have a higher correlation with the DAS-A-17 scales than other scales for the internet sample, and similar to two other domains for the student sample. The DAS was developed to measure dysfunctional schema in depression and includes items related to social relationships, so it was not surprising that the correlation with the social risks domain would be higher than for other domains, given social withdrawal is a common feature of depression.

It was hypothesised that the ERI-E scales and AnTI scales measuring similar constructs (the ERI-E social risks scale with the AnTI social worry scale, and the ERI-E health risks scale with the AnTI health worry scale) would have higher correlations than other domains had with these scales. The hypothesis for the health scales was partly supported. For the student sample health risks had the highest correlation with health worry of all the ERI-E domains, but only slightly more than for risks involving personal danger (Table 60). The health worry items also contain items related to physical injury, so this relationship was consistent with what the health worry scale measures, and provides some evidence of the construct validity of these two domains. However, for the internet sample the correlations were not significant, and correlations between the AnTI scales and everyday RTB scales were very low for this sample generally (Table 61).

The AnTI was the last scale to be completed by participants so order effects could have had an influence on participants responses, people responding to the last scale may have taken less time to respond and did not consider questions adequately. With the paper version people could complete part of the questionnaire before returning to finish any remaining items, whereas for the internet version people had to complete it at one time. The lack of significant results for the relationship between health worry and health risks for the internet sample may indicate an inconsistency caused by participants not adequately considering responses for the last questionnaire.

The hypothesis that social worry would have a higher correlation with social risks, compared to other everyday RTB domains was largely supported. For the internet sample it was the only domain that had a significant negative correlation with social worry (Table 61), and for the student sample had a significant correlation also, although slightly smaller than the correlation between some other domains and social worry. In both samples social risk taking had a higher correlation with social worry than any of the other AnTI scales. The magnitude of the correlations was however relatively small, and given the similarity of some items was not of the

magnitude that was expected, which may again reflect the order of questionnaires (mentioned in previous paragraph).

Additional statistical analysis showed that there were some significant differences in results of New Zealand and United States participants, including that the relationship between RTB and cognitive factors was different between countries. There were far fewer significant correlations for the United States sample (Table 64) than the New Zealand sample (Table 65), and this was not explained by the smaller sample size. The reason for the significant differences between the samples is difficult to interpret, but analysis of different relationships at different level of anxiety may explain some of these results.

Table 62 shows that the United States sample had significantly higher anxiety levels than the New Zealand sample. Tables 67 and 68 show that the relationship between everyday RTB and cognitive factors differs depending on the level of anxiety, with the largest differences being between mild and moderate anxiety levels. Numbers in each group are too small to see whether this pattern is statistically different for each sample, but this result may explain the apparent differences between the two nationalities. The conclusion is that the relationship between risk taking and cognitive dysfunction is different depending on the level of anxiety. This pattern occurs even when scores on almost all measures are not significantly different, meaning it cannot be explained by differences in scores on the measures that are being correlated. This relationship is consistent across all cognitive factors, but strongest for worry, and across all risk domains, other than risks involving other people. For people with mild levels of anxiety avoidance of risk tends to be associated with their level of cognitive dysfunction, whereas people with moderate (and to some extent severe) anxiety show the same level of cognitive dysfunction and avoidance of risk, but whether they take risks is not a affected by their level of cognitive dysfunction.

The hypothesis that everyday RTB would have a higher correlation with cognitive factors than anxiety level was supported. Simple correlations between cognitive factors and everyday RTB were in general higher than those between anxiety level and everyday RTB (see Table 60 and Table 61). Further evidence of the importance of cognitive factors in explaining differences in everyday RTB compared to anxiety level was that a model with cognitive factors affecting RTB was an excellent fit for the data. Once the effects of the relationship of cognitive factors with both anxiety level and everyday RTB were controlled for, anxiety level had a non-significant relationship with everyday RTB, for the two cognitive variables analysed (worry and intolerance of uncertainty) (Figure 8).

These results clearly show that cognitive factors affect people's everyday RTB, rather than anxiety level. Why this may be the case is difficult to determine. Cognitive factors typically explain approximately 40% of the variation in anxiety scores in previous research (e.g. Khawaja & Chapman, 2007; Meyer et al., 1990), and slightly less in the present research. As generalised anxiety disorder (GAD) has worry that is excessive and difficult to control as part of the diagnostic criteria (APA, 2000), it is likely that the correlation between cognitive measures and anxiety level is measuring this aspect of worry. The variance that is unexplained by anxiety is therefore approximately 60%, and these aspects of cognitive factors are those that are likely to be associated with everyday RTB. In other words, measures of cognitive factors, such as worry, measure aspects related to people's level of anxiety, but also other aspects of these factors not associated with anxiety, which may be associated with everyday RTB.

4.5. Conclusion

A majority of the hypotheses of this section were supported. Measures of cognitive factors associated with anxiety play a significantly more important role in explaining people's avoidance of the risks of everyday life than anxiety level does, and a model with no cognitive factors affecting both anxiety level and everyday RTB, with no direct relationship between anxiety level and everyday RTB, is an excellent fit for the data. This means that avoidance of everyday risk is not a consequence of experiencing anxiety, but a consequence of cognitive factors that are associated with anxiety. Intolerance of uncertainty is particularly important in people being avoidant of the risks of everyday life, with worry also being an important factor. These are both cognitive factors particularly associated with anxiety.

There were significant differences however in these results between participants from different countries, so the ability to generalise these results is limited. This may be due to the complex relationship of anxiety level with the correlations between risk taking and cognitive measures. It appears this relationship only occurs at lower levels of anxiety, as people become more anxious their cognitions are less likely to cause them to become risk avoidant, whereas at lower levels of anxiety they are more likely to.

The reason why cognitive factors related to anxiety had higher correlations with everyday RTB than anxiety levels is most likely because worrying thoughts will lead to people to make immediate decisions to avoid everyday risks, which is what the ERI-E measures. Anxiety occurs with excessive worries, and this threshold does not need to be reached to cause people to avoid risks. In other words, worry and intolerance of uncertainty (in particular) are enough to make people risk averse, whether these occur at excessive levels, and cause anxiety, or not.

Chapter 5: Amalgamation of Research Results.

Combined results from the research enable a range of general conclusions to be drawn, in addition to those already included in discussion sections for each individual study. Included in this are limitations of the research as a whole, and new directions for research in the general topic area of anxiety, depression and everyday RTB. These include issues related to the measures used in more than one stage of the research, the ERI-E and the DASS-21.

5.1. General Discussion

The issue of whether everyday RTB is a single construct, or consists of multiple domains was uncertain from the confirmatory factor analysis (CFA) of Chapter 2. Results from later sections of this research indicate that quite different results are obtained for different domains, and in many cases these results were as hypothesised. Everyday RTB being a multiple domain construct is further supported by the face validity of the ERI-E, and the correlations between the subscales showing a degree of convergent and discriminant validity (see Section 2.4.1). These factors indicate that everyday RTB is a multidomain construct, but with an overall construct of everyday risks, as indicated by the CFA results. People therefore show some general aspect of being avoidant of everyday risks, but are also likely to avoid some specific types of risks more than others. Some of the examples of domain specificity are the differences in variability explained by socio-demographic variables (particularly age). For the community sample socio-demographic variables explained only 10% of variability in risks to others (Table 24Table), but over 25% for risks involving personal danger (Table 21). RTB also showed domain specific preferences depending on gender, with females more avoidant of risk involving personal danger and risks to others, but less risk avoidant of unknown risks (Table 20).

Correlational analysis for the community sample showed that age, gender, qualification, children, and income all had significant correlations with the unknown risks score. Similarly, for Chapter 4, significantly different results were gained for different domains, for the student sample in particular, risks to others had significantly lower correlations with the cognitive measures than other domains (Table 60). Unknown risks also had the highest correlation with the most similar cognitive construct, intolerance of uncertainty, particularly for the internet sample (Table 61), supporting the construct validity of this scale. The issue of reliability of ERI-E domains, must be taken into account in interpreting these results.

Cronbach's alpha values for the ERI-E domains in Chapter 2 samples were adequate for the community sample, but low for the student sample in particular (Table 9), and these results were largely replicated in Chapter 4 (see Appendix K). The ERI-E is a less reliable tool for student samples than other samples, and this is particularly the case for the risks to belongings scale. For a community sample, with an older average age, risks to belongings has adequate internal consistency, but is below 0.6 for both student samples. This indicates that students differ more in the belongings they are prepared to take risks with than people who are older, but why this would be the case is not possible to determine.

The problems with reliability for RTB domains also occurred for other measures such as the DOSPERT (Blais & Weber, 2006a). The ERI-E is a more useful tool for measuring RTB in multiple domains for general population samples than other measures, due to the items being applicable to a wider range of people, both in terms of age and socio-economic characteristics. Psychometric limitations of the ERI-E are similar to those for the DOSPERT generally (Weber et al., 2002), with each suited to different populations, the DOSPERT for highly educated, high income participants, the ERI-E for more general population samples.

Analysis of the relationships between anxiety, depression and everyday RTB was undertaken in Chapter 3, and the same measures were also used in Chapter 4. Comparing the results confirms the conclusion from Chapter 3 that there is a relationship between anxiety and everyday RTB, but this relationship is weak, being significant for some samples, but not others. It also confirms the hypothesis that anxiety level has a stronger relationship with everyday RTB than depression level. The correlations between these measures in the student sample in Chapter 4 was higher than that in Chapter 3, leading to more significant results, including for the overall everyday RTB score. Given the similar methods of data collection, and therefore similar participant characteristics, this difference was not expected. This supports the conclusion from the first study that the difference in conclusions in the literature concerning the relationship between RTB and anxiety level is more likely to be due to minor factors, such as measures used and sample sizes, than significant differences due to the type of participants. There is some domain variability in results, but no domain has a significant correlation with anxiety level for all samples. This may be due to the complex relationships of anxiety (and depression) level with everyday RTB, and cognitive measures associated with anxiety.

Results in Chapter 3 indicate there are some non-linear affects of anxiety and depression level on everyday RTB (see Section 3.3.3). A moderate level of depression was associated with risk

aversion for some everyday RTB domains, with high levels of anxiety or depression (but not both) predicting higher RTB for social risks. Results in Chapter 4 also show a complex relationship where the relationship between cognitive factors and everyday RTB is stronger at low levels of anxiety than high levels of anxiety (Table 63), and this cannot be accounted for by differences in scores on the cognitive measures. This indicates a weakness of previous research, which has generally relied solely on correlational or regression analyses, which cannot detect non-linear results.

The more significant correlations of socio-demographic variables, rather than anxiety (and depression) level with everyday RTB were less evident in study 2 than study 1, but this was largely due to sample differences, with the community sample having a far wider range of these variables, particularly age. Even given this limitation, age, gender, and qualification still have more significant correlations with everyday RTB scales than anxiety or depression level did, supporting the conclusions from study 1. Although comparisons are difficult due to different samples, it does seem that socio-demographic variables explain more of the variability in everyday RTB than cognitions associated with anxiety, as the correlations with socio-demographic variables was higher (Table 20) than for those with cognitions associated with anxiety (Tables 60 and 61). Therefore people's age (in particular) will make them more likely to avoid everyday risks than their level of worry or intolerance of uncertainty will.

Another potential reason for the lack of significant relationships between anxiety and everyday RTB is the anxiety measure used. The DASS-21 is not the measure used in previous research investigating these relationships, and the nature of what it is measuring may cause the relationship to be less significant. Measures used in past research include the BAI. Comparison of items of the BAI (Beck and Steer, 1990) and the DASS indicate they are measuring similar aspects of anxiety, predominantly physical sensations. Correlations between the two measures are approximately 0.8 (Lovibond & Lovibond, 1995), indicative of measuring very similar constructs.

Correlations between the DASS-21 Anxiety scale and cognitive factors associated with anxiety are similar to those for other anxiety scales, and to those expected from cognitive models, particularly for the internet sample (Table 59). For this sample the AnTI and PSWQ had higher correlations than other cognitive measures, and the DAS-A-17 (a measure of dysfunctional cognitions not specific to anxiety) had the lowest correlation. Similar results occurred for the student sample (Table 60), although the correlations were less, apart from with the DAS-A-17

Comparing these results to those of other research shows some significant differences in the correlations between the cognitive measures used and other measures of anxiety. The

correlation between the BAI and IUS was .57 in two other student samples (Carleton et al., 2007; Freeston et al., 1994), compared to .38 between the DASS-21-Anxiety scale and IUS in this research. This was similar to the correlation between the IUS and the trait scale of the State Trait Anxiety Inventory (STAI-T) (Spielberger, Gorsuch, Lushene, Vagg & Jacobs, 1983) for a clinical sample (Khawaja & Yu, 2010). For other student samples the correlation between the PSWQ and the STAI-T was 0.74 (Khawaja & Chapman, 2007) and 0.64 (Meyer et al., 1990), compared to 0.43 for the correlation between the DASS Anxiety scale and the PSWQ in this research. Correlations between cognitive measures and the DASS Anxiety scale for the internet sample are in general similar to those found for other anxiety measures in previous research.

These results indicate that in spite of some differences from past research using measures of anxiety, in general the DASS-21 anxiety scale was a suitable measure to use in this research. It asks similar questions to other measures used, and although the student sample had different correlations with cognitive measures than previous research, the internet sample had similar correlations. It is unlikely that the weaker relationships between anxiety level and everyday RTB found in this research compared to past research are due to the use of the DASS-21 rather than other measures of anxiety, such as the BAI and STAI-T.

5.2. Importance of Research

This study furthers research in two key areas. The first is in determining whether anxiety and depression are correlated with risk averse behaviour in different domains of everyday RTB. The second is in the importance of cognitions associated with anxiety in explaining differences in RTB, rather than the level of anxiety.

In regards to the first area, results from both studies indicate that there are key differences in the domains in which anxious people are risk averse. In both studies the highest correlations with anxiety level were for risks to belongings, risks involving personal danger, and health risks, although there was some inconsistency across samples. Of these only health risks was hypothesised to correlate more highly with anxiety level than other risk domains. These results therefore advance research by showing some evidence that anxious people avoid some risks more than others, even though there is some inconsistency in the results across samples. On the other hand depression level had very weak and inconsistent correlation with everyday RTB domains across both studies, and there is therefore no evidence that depression is related to risk aversion, either generally or for specific domains.

For the second research area there is strong evidence that the cognitions associated with anxiety are more highly correlated with everyday RTB than anxiety level is. A SEM analysis showed

that a model where there is no direct relationship between anxiety level and RTB was an excellent fit for the data. This advances current knowledge as previous research was limited in this area. Although there were some differences between domains, in general the correlations between measures of cognitive factors associated with anxiety and the total everyday risks scale was higher than those for individual domains. A further research finding that advances knowledge in this area is that the relationship between cognitive measures associated with anxiety and everyday RTB differs depending on the level of anxiety, with the correlations being higher at mild levels of anxiety than at moderate and severe levels of anxiety.

5.3. Limitations

One of the main limitations of this research was the data collection methods used, in particular the use of surveys that were filled in relatively quickly by participants. Previous research and theories of anxiety indicate that the relationship between anxiety and RTB may only occur once adequate time is taken to consider fully the risks involved in making a decision to engage in RTB. Maner et al. (2007) found that when making decisions a self-perpetuating cycle exists, in which anxiety acts as an input into the decision making process leading to risk avoidant decision making, promoting further anxiety. The LMS model (Riskind, 1997) indicates that a similar feedback mechanism occurs where once the RTB is considered the increasing sense of threat predicts risk averse behaviour. Also, schema theory predicts that anxious people talking or thinking about a dangerous situation makes the threat more salient and imminent, bringing the distant danger into the present (Beck et al., 1985). For depressed people reduced risk taking was associated with the consequences of risk taking being more fully considered (Hockey et al., 2000). This indicates that the relationship between anxiety, depression and everyday RTB may be significantly underestimated by the use of surveys where quick responses are given to risk taking scenarios. This affects a majority of the research for everyday RTB, such as those using the DOSPERT (Weber et al., 2002), and the present research.

A further problem with the data collection method is the use of a self-report scale to assess depression. A significant number of clients scored in the severe range for depression. Given that the DSM-IV criteria for major depressive disorder include psychomotor retardation, loss of energy, diminished ability to concentrate, and severely diminished interest or pleasure in activities (APA, 2000), it is unlikely that severely depressed people would complete a survey which they were not required to do, and which requires the ability to concentrate for a period of time. It is likely that only people with moderate levels of depression (and below) completed the surveys. It is more likely that people with high levels of anxiety would complete the measures. Also, the DASS measures anxiety generally rather than any specific type of anxiety.

The lack of a clinically anxious sample is a major limitation of the research. OCD has been shown in past research to have a particularly strong association with RTB (e.g., Cicolini & Rees, 2003), and also with at least one cognitive factors used in Chapter 4, intolerance of uncertainty. This factor has the highest correlations with RTB, and the combination of these results indicate OCD specifically, rather than anxiety in general, is associated with risk averse behaviour, but a lack of a clinical sample means this hypothesis cannot be tested. There is also research evidence supporting the specificity of OCD in risk averse behaviour (Rees et al., 2005). Furthermore, there are indications of a non-linear relationship between anxiety and cognitive factors associated with anxiety, and the use of a clinical sample could determine if the relationship was specific to people suffering from an anxiety disorder.

A further limitation is the psychometric problems associated with the ERI-E. There is still no clear determination as to whether the ERI-E should be considered a single factor or multidomain measures. CFA results were inconclusive, and internal consistency values were low for some samples, particularly student samples. Similar measures have found similar problems in obtaining consistent results across samples (Blais & Weber, 2006b), and results for the ERI-E in this research make it as suitable as any other measure available for assessing this construct, in spite of these limitations.

A final limitation is the use of only cognitive variables in the last section. Previous research has shown personality variables to be important in both clinical disorders (Trull & Sher, 1994), and is also associated with RTB for everyday risks generally (Nicholson et al., 2005), and health risks in particular (Vollrath, Knoch & Cassano, 1999). These factors were not measured in this research and could have mediated the results of the relationships being cognitive factors and everyday RTB.

A consequence of these limitations is that the recommendation of the measure for use in clinical settings is problematic. It could still be used to assess areas in which the individual is overly risk averse, and this could form the basis for homework exercises (for instance), but without an established link between anxiety and everyday RTB recommending this as part of treatment for anxiety is difficult to justify.

5.4. Further research

A key area for future research is the assessment of the domain specific differences in everyday RTB for people who are experiencing an anxiety disorder. The disorders of most interest are GAD, social phobia, and OCD, although research with any anxiety or depressive disorder would add to the research on everyday RTB. If the links between psychiatric disorders and everyday

RTB are determined to be significant then research into the use of the ERI-E to aid in the identification of risk averse behaviour to aid in treatment would be recommended.

Further psychometric testing of the ERI-E is also required, including use with other populations, and further testing of the validity of the individual domain scales. The majority of participants completing the ERI-E to date have been from the United States and New Zealand, and testing the validity of the measure with other nationalities would help establish its suitability for use in other countries. This is particularly important given the differences in fit indices between the internet and New Zealand sample in study 1, and between the United States and New Zealand participants in study 2. Conducting research using measures that would be expected to have higher correlations with specific domains (rather than the overall everyday risks score) would provide evidence of the validity of the ERI-E as a multiple domain measure of everyday RTB.

Given the limitations of the survey method used, further investigation into the link between everyday RTB and anxiety (and depression) that require more consideration of the risks involved in a situation would be worthwhile. The LMS model (Riskind, 1997), and other theories indicate that this would invoke anxiety in the client in a way that quickly responding on a survey would not. As this more closely replicates the RTB that occurs in everyday life it would add practical validity to the literature on everyday RTB, and RTB in general. Actually engaging in everyday risks and assessing the cognitive content of clients thinking may be a method of research in this area. Finding out why an anxious person avoids some risks more than others would also be useful.

A further area of research is to investigate the reasons why cognitive factors associated with anxiety have significant correlations with both measures of anxiety, and measures of everyday RTB, but anxiety level does not significantly impact on everyday RTB. Understanding which specific aspects of cognitive factors (such as worry and intolerance of uncertainty) impact on anxiety, and which impact on everyday RTB would be useful. Given the stronger relationships between anxiety and everyday RTB for the community sample in study 1 (than the internet and student samples), repeating study 2 with a community sample would also further research in this area.

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APPENDICES

Appendix A: Handout for first stage of project

Do you avoid everyday risks?

Do you lock your house when home by yourself?

Would you pick up a hitchhiker?

Would you drive 20 kilometres over the speed limit?

Would you share a drink bottle with a friend?

I am a clinical psychology student at Massey University student conducting a study of whether people avoid the risks of everyday life. I am looking to see whether people's avoidance of these risks is related to anxiety and depression. To participate in this research please fill in the following questionnaires. This will take about 15 minutes.

Your assistance in helping with this research would be greatly appreciated

Are anxious and depressed people more likely to avoid the risks of everyday life?

INFORMATION SHEET

Researcher(s) Introduction

This research is being conducted by Brett Hunt, who is a student at Massey University in Wellington, and is for a Doctor of Clinical Psychology. He can be contacted via email (everydayrisk@hotmail.com.uk) or via phone on (0210391492). This project is for a Doctor of Clinical Psychology. The supervisor for this project is Steve Humphries who can be contacted on 04 801 5799 x 6258 or s.a.humphries@massey.ac.nz, if you have any concerns about the research.

Participants

Thank you for agreeing to participate in this research. The aim of this project is to see how whether people who avoid the risks of everyday life are more likely to be anxious, or have some degree of depression.

Could you please fill in the two questionnaires and demographic information sheet, which will take about 15 minutes (Please ensure you fill in the reverse side of each sheet). You do not have to answer any question you don't want to, and can withdraw from participating in the study at any point. Your consent to participate in the study will be assumed by completion and return of the questionnaires. A stamped addressed envelope is attached for you to return your questionnaires (note that it is freepost, so you do not have to put a stamp on the envelope). To participate in this study you need to be at least 16 years old and by agreeing to take part in the study you will also be confirming that you are at least 16 years old.

If you would like a copy of a summary of the research findings then supply an address (either email or postal) to the researcher. It is not possible to give information about your individual responses. The questionnaires will be stored for five years in a secure area and then destroyed.

Risk and benefits for participation

There is no anticipated risk in participating in this study. Although completing this questionnaire will be of no direct benefit to you personally, this study will help us understand more fully the impact that being overly avoidant of risks can have on people.

Anonymity

Your participation in this study will be anonymous. All data are treated as confidential and will not be linked to any personally identifying information. Your personal details are only collected if you want to have a summary of the research findings, and this information will be separated from your questionnaires as soon as they are received.

Thank You

Brett Hunt

This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern B, Application 08/50. If you have any concerns about the conduct of this research, please contact Dr Karl Pajo, Chair, Massey University Human Ethics Committee:Southern B, telephone 04 801 5799 x 6929, email humanethicsouthb@massey.ac.nz

Demographic Information for Everyday Risk Avoidance Project

Can you please provide this information. The reason is so that comparisons can be made for different groups of people.

Age: _____

Gender: Male Female

Ethnicity: NZ Pakeha/European
Maori
Pacific Islander
Asian
Other (please specify)_____

Do you have a qualification from a university or polytechnic?
Yes No

Do you have dependent children?
Yes No

Relationship Status
Single Married Other relationship

Employment Status
Not working Part time Full time Student

Income (yearly)
<$20,000 $20 ,000-$40,000 $40,000-$60,000 >$60,000

Population of town/city you live in:

<5,000 5,000-20,000 20,000-100,000 >100,000

Everyday Risk Inventory – Expanded Version

Listed below are various activities that people sometimes do that involve some degree of risk. Please rate the extent to which you would be likely to do each of these things. Some of the items may not apply directly to your current situation. For example, you may not be married, but the question might refer to your spouse. In this case, please respond as if you were married.

Please use the following scale:

1	2	3	4	5
I would never do this	I am unlikely to do this	I might do this	I would probably do this	I would definitely do this

_____ 1. Leave your car unlocked while going into a shop for a few minutes.

_____ 2. See a movie without knowing much about it.

_____ 3. Drive 20 kilometres over the speed limit on a motorway.

_____ 4. Go on a holiday without a specific itinerary.

_____ 5. Eat meat that did not seem to be properly cooked.

_____ 6. Drink from a water fountain in a public place.

_____ 7. Make a recipe for the first time for guests.

_____ 8. Sit directly on a public toilet seat.

_____ 9. Go walking in a national park out of mobile phone coverage

_____ 10. Let a 2 year old play on the kitchen floor after broken glass had been swept up with a broom.

_____ 11. Drink from a bottle used by a friend.

_____ 12. Go out into the open ocean on a small boat.

_____ 13. Pat an unfamiliar large dog in the park whose owner is not in sight.

_____ 14. Use a toilet stall whose latch is broken.

_____ 15. Let a 10 year old girl walk to school by herself.

_____ 16. Go out without a coat in cold weather.

_____ 17. Not put the parking brake on when the car is on a slight hill, with the car in gear.

_____ 18. Swim less than 30 minutes after eating a meal.

_____ 19. Allow a stranger to come into your home to use your phone.

_____ 20. Drive in heavy rain to do an errand you could postpone.

1	2	3	4	5
I would never do this	I am unlikely to do this	I might do this	I would probably do this	I would definitely do this

_____ 21. Let a friend leave a bar to go home with someone she has just met.

_____ 22. Borrow something from a friend without asking because he/she was unavailable.

_____ 23. Take a shortcut down a dark path at night.

_____ 24. Walk under a ladder.

_____ 25. Leave your house unlocked when you're home during the day.

_____ 26. Order a dish in a foreign restaurant when you don't know the ingredients.

_____ 27. Reveal a friend's secret to someone else.

_____ 28. Pick up a hitchhiker.

_____ 29. Leave the iron plugged in with the dial in the "off" position.

_____ 30. Drive somewhere without directions.

_____ 31. Drive after having had a few alcoholic drinks.

_____ 32. Have unprotected sex.

_____ 33. Do a bungy jump.

_____ 34. Get in a car with a driver who is over the drink driving limit.

_____ 35. Move to a city where you don't know many people.

_____ 36. Leave a small child at home alone while going out for a few minutes.

_____ 37. Go to a party or bar by yourself.

_____ 38. Disagree with a friend, knowing it could lead to an argument.

_____ 39. Leave your washing on the line shared with other houses/flats.

_____ 40. Take illegal drugs.

_____ 41. Let a female friend walk home alone at night.

_____ 42. Ask someone on a date, without knowing if they will say yes.

_____ 43. Tell a friend the truth, even though it might upset them.

_____ 44. Marry someone my parents did not approve of.

_____ 45. Change jobs to one that was more exciting but also unpredictable.

_____ 46. Lend your car to a friend.

_____ 47. Meet up with someone you only know through the internet.

1	2	3	4	5
I would never do this	I am unlikely to do this	I might do this	I would probably do this	I would definitely do this

_____ 48. Quit a job without another one to go to.

_____ 49. Fly in a small plane.

_____ 50. Lend your favourite book or CD to a friend.

_____ 51. Leave an unlocked bicycle outside your house.

_____ 52. Leave your jacket unattended in a bar.

_____ 53. Let teenage children stay in your house when you go away for the weekend.

_____ 54. Go on a blind date set up by a friend.

_____ 55. Let your child drive someone else's car.

_____ 56. Leave your drunk best friend at a bar.

_____ 57. Eat food that is just past its use by date.

_____ 58. Let a friend drive home when they were drunk.

_____ 59. Go to the doctor if you have a physical problem that won't go away.

_____ 60. Take a medical drug that is known to have a high chance of negative side effects.

_____ 61. Not have a working smoke alarm in your house.

_____ 62. Ask your boss for a raise in your wages.

_____ 63. Go on a date with a work colleague.

_____ 64. Go flatting/boarding with people you don't know very well.

_____ 65. Wear clothes that may not be appropriate for the occasion (makes you stand out).

_____ 66. Admit that your tastes are different to those of your friends.

_____ 67. Get very drunk.

_____ 68. Have an affair with someone who is married.

_____ 69. Regularly eat foods that could cause long term health problems.

_____ 70. Give a speech before a large audience.

_____ 71. Supply alcohol to a minor.

_____ 72. Take a young child in a car without a proper child seat.

_____ 73. Leave a child with a babysitter recommended to you, but who you don't know personally.

_____ 74. Let an acquaintance say something that you think will make them look stupid.

DASS21

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all

1 Applied to me to some degree, or some of the time

2 Applied to me to a considerable degree, or a good part of time

3 Applied to me very much, or most of the time

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

Appendix B– Statistical information for each sample.

Descriptive Statistics for all ERI-E items – Community sample.

	Minimum	Maximum	*M*	*SD*	Skewness	Kurtosis	Corrected Item-Total Correlation
ERI1	1	5	2.15	1.286	.872	-.380	.505
ERI2	1	5	3.03	1.152	.001	-.763	.463
ERI3	1	5	2.57	1.220	.366	-.840	.448
ERI4	1	5	3.05	1.315	.016	-1.181	.455
ERI5	1	5	1.91	.952	.961	.368	.472
ERI6	1	5	3.18	1.352	-.233	-1.127	.561
ERI7	1	5	2.93	1.230	-.026	-.952	.326
ERI8	1	5	3.07	1.433	-.149	-1.314	.501
ERI9	1	5	3.51	1.351	-.507	-.968	.647
ERI10	1	5	1.67	.945	1.580	2.118	.386
ERI11	1	5	2.69	1.291	.223	-1.014	.609
ERI12	1	5	2.24	1.311	.763	-.632	.506
ERI13	1	5	2.04	1.137	.903	-.099	.583
ERI14	1	5	2.80	1.213	.115	-.889	.565
ERI15	1	5	3.00	1.148	-.072	-.827	.449
ERI16	1	5	2.71	1.128	.321	-.675	.526
ERI17	1	5	1.46	.805	2.082	4.530	.282
ERI18	1	5	2.81	1.303	.165	-1.092	.558
ERI19	1	5	2.18	1.016	.663	.051	.571
ERI20	1	5	2.65	1.045	.328	-.435	.519
ERI21	1	5	2.25	.945	.680	.205	.507
ERI22	1	5	2.12	.968	.453	-.697	.538
ERI23	1	5	2.06	1.126	.735	-.562	.613
ERI24	1	5	3.07	1.356	-.063	-1.186	.399
ERI25	1	5	3.75	1.412	-.804	-.712	.504
ERI26	1	5	2.77	1.324	.256	-1.079	.554
ERI27	1	5	1.83	.870	1.061	1.209	.356
ERI28	1	5	1.92	1.026	.888	.060	.431
ERI29	1	5	1.90	1.099	1.122	.377	.289
ERI30	1	5	3.01	1.260	.035	-.994	.520
ERI31	1	5	2.20	1.190	.692	-.531	.443
ERI32	1	5	2.06	1.306	1.057	-.109	.481
ERI33	1	5	2.10	1.347	.944	-.428	.380
ERI34	1	5	1.49	.768	1.735	2.952	.427
ERI35	1	5	3.27	1.245	-.180	-.952	.446
ERI36	1	5	1.48	.814	2.040	4.318	.380
ERI37	1	5	2.76	1.298	.224	-1.022	.442

	Minimum	Maximum	*M*	*SD*	Skewness	Kurtosis	Corrected Item-Total Correlation
ERI38	1	5	3.02	.968	.163	-.271	.533
ERI39	1	5	2.95	1.229	.072	-.985	.580
ERI40	1	5	1.62	1.118	1.761	2.003	.484
ERI41	1	5	1.66	.849	1.451	2.337	.456
ERI42	1	5	2.79	1.154	.171	-.701	.474
ERI43	1	5	3.32	.975	-.122	-.486	.435
ERI44	1	5	3.24	1.130	-.205	-.658	.445
ERI45	1	5	2.87	1.073	.175	-.471	.483
ERI46	1	5	3.64	1.110	-.476	-.476	.496
ERI47	1	5	2.04	1.148	1.005	.197	.467
ERI48	1	5	2.35	1.207	.744	-.268	.408
ERI49	1	5	3.84	1.248	-.737	-.625	.471
ERI50	1	5	4.30	.864	-1.110	.746	.464
ERI51	1	5	3.16	1.416	-.069	-1.316	.455
ERI52	1	5	2.28	1.180	.692	-.462	.402
ERI53	1	5	2.41	1.133	.494	-.534	.314
ERI54	1	5	2.90	1.242	.069	-.902	.455
ERI55	1	5	2.10	1.056	.692	-.262	.517
ERI56	1	5	1.78	.930	1.332	1.715	.409
ERI57	1	5	3.09	1.244	-.153	-.884	.523
ERI58	1	5	1.49	.764	2.062	5.438	.372
ERI59	1	5	4.37	.812	-1.301	1.399	-.030
ERI60	1	5	2.20	.957	.636	.112	.296
ERI61	1	5	2.28	1.180	.668	-.397	.446
ERI62	1	5	3.17	1.155	.004	-.764	.272
ERI63	1	5	2.85	1.183	.132	-.747	.382
ERI64	1	5	2.75	1.180	.360	-.751	.540
ERI65	1	5	2.35	1.041	.812	.330	.518
ERI66	1	5	3.94	.987	-.874	.416	.390
ERI67	1	5	2.56	1.466	.516	-1.145	.608
ERI68	1	5	1.67	1.007	1.671	2.369	.402
ERI69	1	5	2.18	1.034	.814	.206	.488
ERI70	1	5	3.12	1.342	-.056	-1.172	.321
ERI71	1	5	1.71	.889	1.258	1.266	.455
ERI72	1	5	1.48	.697	1.522	2.649	.425
ERI73	1	5	2.22	.974	.469	-.460	.446
ERI74	1	5	2.53	.923	.572	.313	.444
Minimum			4.37		2.08	5.44	.647
Maximum			1.46		-1.30	-1.32	-.030

Descriptive Statistics for all ERI-E items – Internet sample.

	Minimum	Maximum	*M*	*SD*	Skewness	Kurtosis	Corrected Item-Total Correlation
ERI1	1	5	2.17	1.399	.851	-.636	.391
ERI2	1	5	3.40	1.213	-.309	-.866	.315
ERI3	1	5	3.06	1.266	-.057	-.989	.362
ERI4	1	5	3.28	1.333	-.168	-1.172	.324
ERI5	1	5	1.70	.971	1.455	1.725	.366
ERI6	1	5	3.47	1.318	-.519	-.864	.352
ERI7	1	5	3.09	1.357	-.187	-1.180	.356
ERI8	1	5	2.91	1.538	.037	-1.497	.388
ERI9	1	5	3.77	1.209	-.684	-.567	.484
ERI10	1	5	1.66	.925	1.502	1.935	.302
ERI11	1	5	3.46	1.376	-.377	-1.101	.575
ERI12	1	5	2.48	1.323	.458	-.918	.500
ERI13	1	5	2.48	1.366	.437	-1.086	.371
ERI14	1	5	2.87	1.197	.035	-.863	.453
ERI15	1	5	2.16	1.104	.655	-.528	.340
ERI16	1	5	3.12	1.279	-.187	-.999	.296
ERI17	1	5	2.06	1.286	.976	-.235	.338
ERI18	1	5	3.79	1.301	-.932	-.170	.506
ERI19	1	5	1.75	.957	1.162	.562	.514
ERI20	1	5	3.06	1.269	-.129	-.923	.473
ERI21	1	5	2.18	1.193	.841	-.039	.523
ERI22	1	5	2.30	1.107	.572	-.203	.415
ERI23	1	5	2.14	1.156	.675	-.606	.485
ERI24	1	5	3.49	1.376	-.519	-.922	.408
ERI25	1	5	3.29	1.481	-.326	-1.286	.458
ERI26	1	5	2.67	1.371	.203	-1.166	.430
ERI27	1	4	1.92	.934	.637	-.627	.306
ERI28	1	5	1.40	.810	2.234	4.739	.354
ERI29	1	5	2.52	1.427	.390	-1.215	.367
ERI30	1	5	3.07	1.350	-.025	-1.212	.391
ERI31	1	5	2.11	1.169	.661	-.680	.336
ERI32	1	5	2.52	1.402	.342	-1.261	.454
ERI33	1	5	2.67	1.528	.262	-1.426	.352
ERI34	1	5	1.81	1.028	1.075	.248	.362
ERI35	1	5	3.41	1.321	-.400	-.895	.476
ERI36	1	5	1.42	.821	2.074	3.879	.391
ERI37	1	5	2.79	1.381	.179	-1.159	.434
ERI38	1	5	3.57	1.084	-.416	-.396	.364

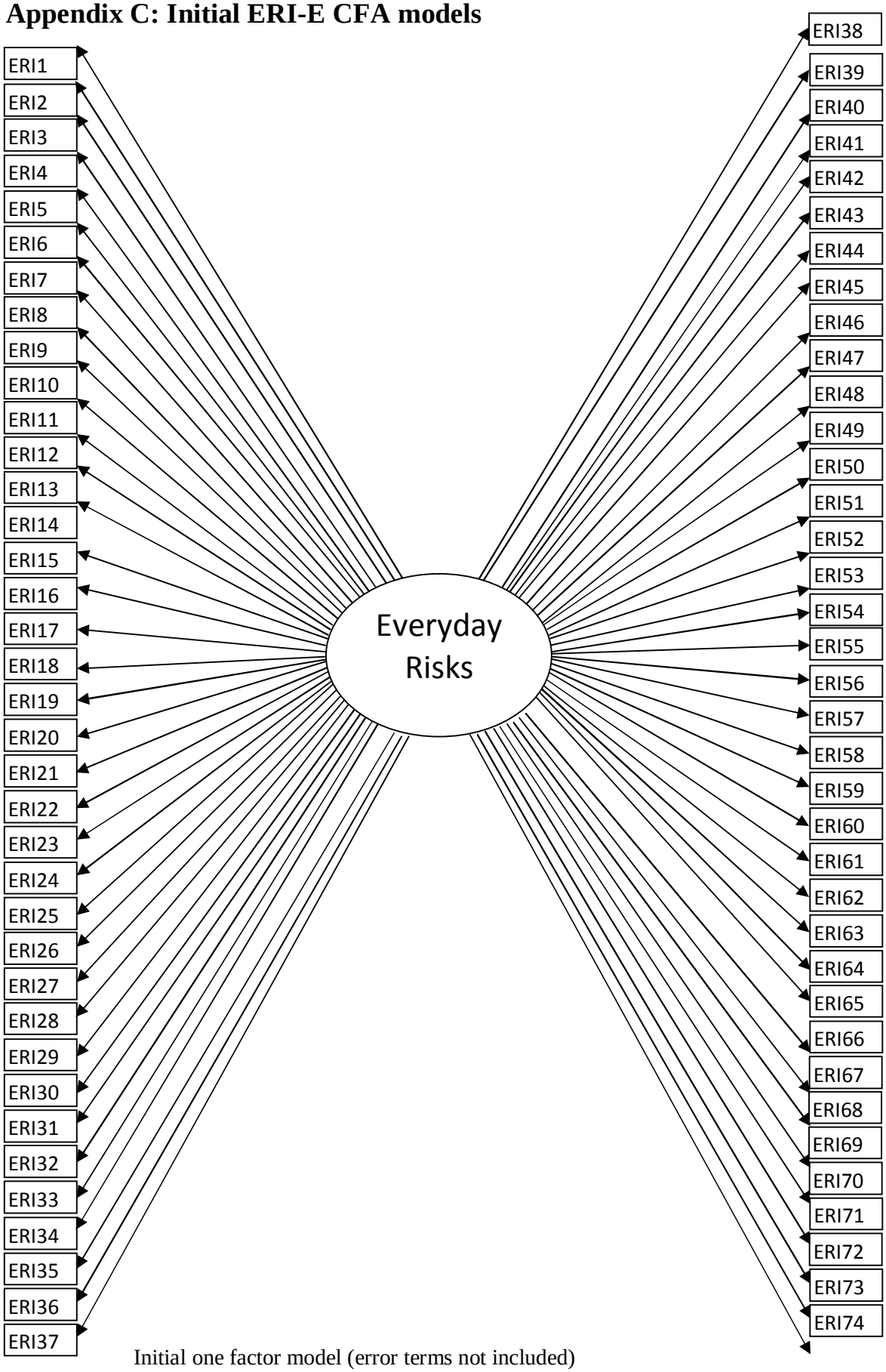
	Minimum	Maximum	*M*	*SD*	Skewness	Kurtosis	Corrected Item-Total Correlation
ERI39	1	5	2.62	1.307	.338	-.872	.644
ERI40	1	5	2.26	1.401	.672	-.907	.472
ERI41	1	5	2.04	1.065	.828	.029	.468
ERI42	1	5	3.18	1.375	-.225	-1.136	.389
ERI43	1	5	3.90	1.037	-.851	.382	.259
ERI44	1	5	3.55	1.131	-.266	-.691	.351
ERI45	1	5	3.27	1.259	-.131	-1.052	.553
ERI46	1	5	3.37	1.306	-.342	-.944	.472
ERI47	1	5	2.61	1.423	.370	-1.196	.413
ERI48	1	5	2.62	1.418	.308	-1.210	.415
ERI49	1	5	3.50	1.392	-.443	-1.109	.422
ERI50	1	5	4.29	.891	-1.285	1.571	.350
ERI51	1	5	3.13	1.499	-.169	-1.397	.401
ERI52	1	5	2.57	1.348	.354	-1.091	.513
ERI53	1	5	2.18	1.249	.817	-.344	.375
ERI54	1	5	3.22	1.299	-.279	-.937	.411
ERI55	1	5	2.05	1.104	.902	.202	.374
ERI56	1	5	1.62	.939	1.679	2.604	.396
ERI57	1	5	2.66	1.413	.270	-1.244	.426
ERI58	1	5	1.54	.866	1.785	3.158	.321
ERI59	1	5	4.21	.937	-.898	-.039	-.067
ERI60	1	5	2.50	1.205	.431	-.609	.492
ERI61	1	5	2.28	1.243	.637	-.626	.484
ERI62	1	5	3.17	1.213	-.089	-.843	.245
ERI63	1	5	3.28	1.304	-.332	-.873	.395
ERI64	1	5	2.34	1.145	.602	-.222	.564
ERI65	1	5	2.68	1.333	.330	-1.092	.519
ERI66	1	5	4.13	.992	-1.285	1.642	.385
ERI67	1	5	3.14	1.579	-.149	-1.517	.455
ERI68	1	5	1.82	1.163	1.418	1.139	.181
ERI69	1	5	2.57	1.197	.342	-.676	.368
ERI70	1	5	2.91	1.371	-.013	-1.166	.303
ERI71	1	5	1.89	1.157	1.137	.245	.474
ERI72	1	5	1.52	.798	1.694	2.943	.319
ERI73	1	5	2.13	1.030	.522	-.543	.307
ERI74	1	5	2.84	1.106	.008	-.532	.411
Minimum			1.40	.80	-1.29	-1.52	-.07
Maximum			4.29	1.58	2.23	4.74	.64

Descriptive Statistics for all ERI-E items – Internet sample.

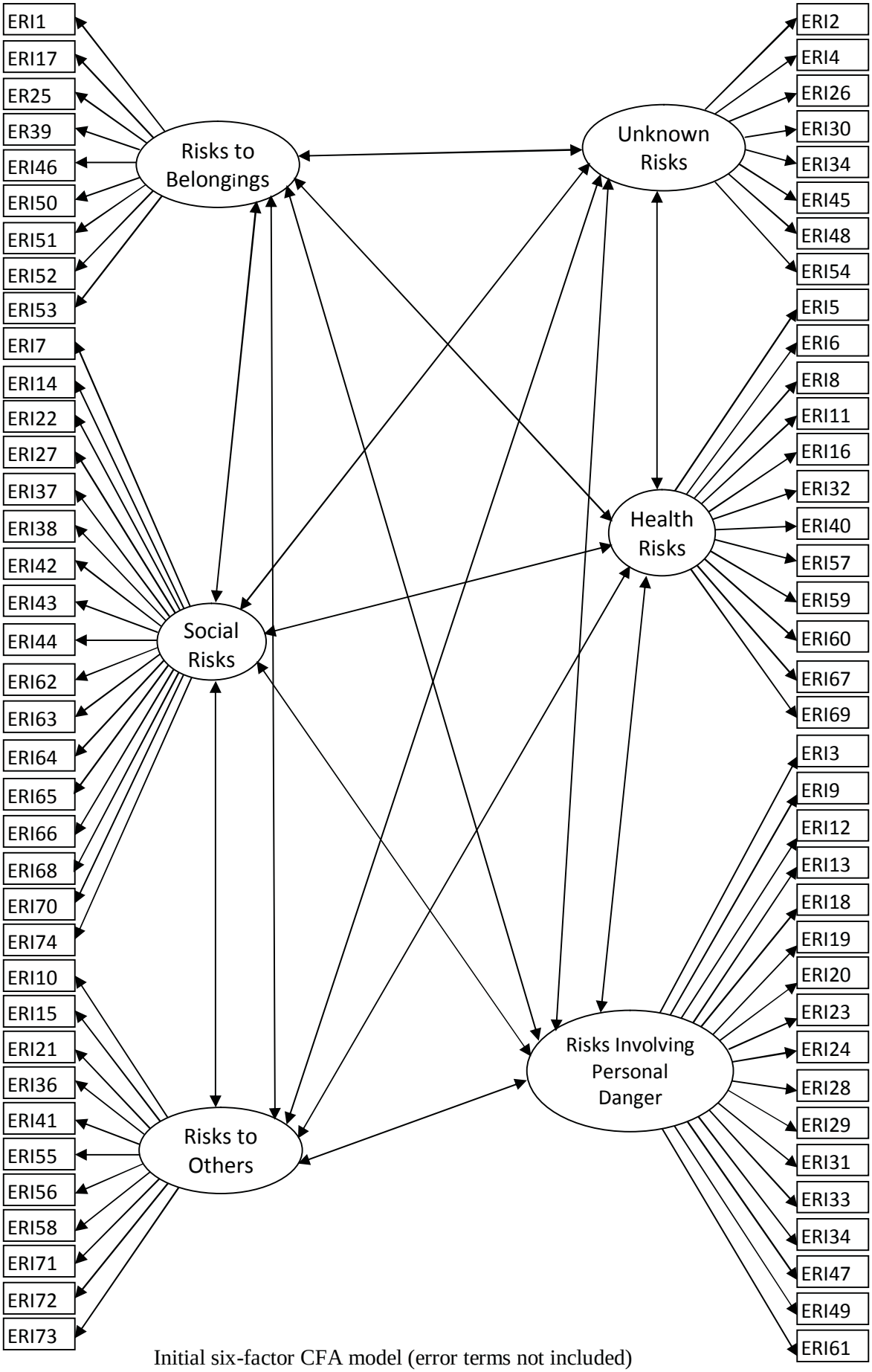
	Minimum	Maximum	*M*	*SD*	Skewness	Kurtosis	Corrected Item-Total Correlation
ERI1	1	5	2.17	1.231	.801	-.399	.362
ERI2	1	5	3.85	.945	-.466	-.502	.379
ERI3	1	5	2.72	1.167	.324	-.804	.326
ERI4	1	5	3.28	1.227	-.238	-.916	.371
ERI5	1	5	2.26	1.063	.464	-.703	.375
ERI6	1	5	3.37	1.268	-.279	-1.010	.371
ERI7	1	5	3.23	1.112	-.146	-.761	.355
ERI8	1	5	3.33	1.356	-.277	-1.182	.285
ERI9	1	5	3.93	1.126	-.933	.074	.512
ERI10	1	5	1.82	.971	1.262	1.266	.159
ERI11	1	5	3.65	1.258	-.617	-.669	.443
ERI12	1	5	2.80	1.275	.132	-1.071	.481
ERI13	1	5	2.71	1.253	.199	-1.049	.331
ERI14	1	5	2.98	1.150	.100	-.869	.501
ERI15	1	5	2.89	1.046	-.027	-.554	.295
ERI16	1	5	3.21	1.099	-.197	-.694	.403
ERI17	1	5	1.76	.928	1.496	2.602	.145
ERI18	1	5	3.94	1.113	-.946	.167	.388
ERI19	1	5	2.58	1.102	.268	-.661	.473
ERI20	1	5	3.16	1.042	-.029	-.664	.287
ERI21	1	5	2.24	.943	.644	.065	.399
ERI22	1	5	2.87	1.021	.093	-.488	.469
ERI23	1	5	2.46	1.154	.402	-.825	.508
ERI24	1	5	3.47	1.344	-.434	-1.001	.367
ERI25	1	5	3.86	1.460	-.963	-.588	.280
ERI26	1	5	3.29	1.257	-.351	-.863	.418
ERI27	1	5	2.02	.924	.902	.846	.231
ERI28	1	5	2.10	1.101	.900	.146	.443
ERI29	1	5	2.74	1.314	.241	-1.172	.222
ERI30	1	5	3.49	1.218	-.406	-.846	.383
ERI31	1	5	1.83	1.063	1.179	.499	.306
ERI32	1	5	2.28	1.240	.736	-.539	.334
ERI33	1	5	3.20	1.497	-.193	-1.378	.271
ERI34	1	4	1.57	.781	1.249	.832	.257
ERI35	1	5	3.99	.992	-.710	-.146	.354
ERI36	1	4	1.67	.921	1.295	.709	.399
ERI37	1	5	2.45	1.196	.690	-.314	.419
ERI38	2	5	3.45	.919	.004	-.820	.448
ERI39	1	5	3.37	1.142	-.161	-.885	.401

	Minimum	Maximum	*M*	*SD*	Skewness	Kurtosis	Corrected Item-Total Correlation
ERI40	1	5	2.26	1.456	.725	-.966	.427
ERI41	1	4	1.80	.808	.836	.256	.339
ERI42	1	5	3.04	1.197	.047	-.848	.319
ERI43	2	5	3.70	.863	-.243	-.557	.303
ERI44	1	5	3.36	1.101	-.229	-.732	.176
ERI45	1	5	3.46	.978	-.057	-.458	.498
ERI46	1	5	3.60	1.029	-.421	-.448	.444
ERI47	1	5	2.21	1.170	.937	.070	.351
ERI48	1	5	2.67	1.035	.314	-.477	.329
ERI49	1	5	4.21	1.046	-1.385	1.312	.322
ERI50	1	5	4.44	.755	-1.560	3.362	.330
ERI51	1	5	3.31	1.232	-.237	-.934	.277
ERI52	1	5	2.37	1.069	.577	-.430	.429
ERI53	1	5	2.81	1.020	-.023	-.517	.420
ERI54	1	5	3.08	1.098	-.045	-.702	.414
ERI55	1	5	2.60	.973	.171	-.393	.430
ERI56	1	4	1.70	.816	1.227	1.248	.331
ERI57	1	5	3.46	1.201	-.518	-.537	.455
ERI58	1	4	1.40	.643	1.697	3.028	.311
ERI59	1	5	4.16	.970	-.989	.263	-.070
ERI60	1	5	2.54	.968	.331	-.305	.280
ERI61	1	5	2.74	1.232	.412	-.848	.412
ERI62	1	5	2.97	1.044	.114	-.409	.246
ERI63	1	5	3.27	.977	.002	-.224	.315
ERI64	1	5	3.44	1.161	-.188	-.960	.447
ERI65	1	5	3.01	1.176	.112	-.902	.405
ERI66	2	5	4.30	.833	-1.133	.768	.157
ERI67	1	5	3.50	1.477	-.475	-1.254	.379
ERI68	1	5	1.65	.940	1.702	2.857	.316
ERI69	1	5	2.50	1.044	.558	-.219	.205
ERI70	1	5	3.16	1.289	.011	-1.114	.214
ERI71	1	5	2.74	1.247	.103	-1.008	.440
ERI72	1	5	1.90	.874	.829	.545	.408
ERI73	1	5	2.56	.988	.156	-.409	.321
ERI74	1	5	2.77	.896	.462	-.048	.312
minimum			1.40	.64	-1.56	-1.38	-.07
maximum			4.44	1.50	1.70	3.36	.51

Appendix C: Initial ERI-E CFA models



Initial one factor model (error terms not included)



Initial six-factor CFA model (error terms not included)

Appendix D: DASS Factor Analysis Results for Internet and Student Samples

Internet sample – Factor loadings using EFA

	Pattern Matrix				Structure Matrix			
	Component				Component			
	1	2	3	4	1	2	3	4
DASS1	.069	-.051	.852	.138	.350	.307	.845	.038
DASS2	.494	.232	.212	.395	.608	.521	.464	.196
DASS3	.835	-.064	.097	-.030	.846	.459	.414	-.249
DASS4	.124	.620	.184	.217	.495	.722	.462	.041
DASS5	.590	.016	.077	-.309	.713	.446	.357	-.477
DASS6	.309	.115	.255	-.531	.619	.501	.485	-.663
DASS7	.146	.573	.125	.005	.523	.706	.416	-.161
DASS8	-.143	.580	.426	-.209	.417	.713	.626	-.333
DASS9	.082	.729	-.063	-.113	.503	.773	.279	-.273
DASS10	.768	.016	.185	-.009	.855	.532	.505	-.235
DASS11	.227	.189	.362	-.344	.573	.534	.568	-.481
DASS12	.003	.207	.685	-.124	.433	.511	.784	-.240
DASS13	.581	-.047	.231	-.329	.735	.445	.484	-.499
DASS14	.303	.124	.364	-.161	.564	.477	.555	-.305
DASS15	.072	.728	.125	-.094	.564	.839	.459	-.272
DASS16	.897	.025	-.064	.029	.878	.506	.308	-.207
DASS17	.856	.103	-.070	-.054	.900	.574	.325	-.293
DASS18	.252	.382	-.128	-.507	.552	.575	.184	-.636
DASS19	-.021	.740	.116	.225	.389	.730	.383	.070
DASS20	.032	.888	-.246	-.134	.475	.834	.142	-.293
DASS21	.882	.101	-.154	.131	.843	.517	.232	-.106

Internet sample – Correlations between DASS subscales from EFA

Component Correlation Matrix

Component	1	2	3	4
1	1.000	.571	.407	-.264
2	.571	1.000	.405	-.199
3	.407	.405	1.000	-.108
4	-.264	-.199	-.108	1.000

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

Internet Sample – factor loadings for original model with limited correlated factors

Item	Scale	Unstandardised	Standardised
DASS Anxiety	General Psychological Distress	0.463	0.888
DASS Depression	General Psychological Distress	0.674	0.846
DASS Stress	General Psychological Distress	0.426	0.98
DASS2	DASS Anxiety	1	0.56
DASS4	DASS Anxiety	1.12	0.689
DASS7	DASS Anxiety	1.206	0.696
DASS9	DASS Anxiety	1.544	0.73
DASS15	DASS Anxiety	1.61	0.85
DASS19	DASS Anxiety	1.215	0.631
DASS20	DASS Anxiety	1.429	0.735
DASS3	DASS Depression	1	0.815
DASS5	DASS Depression	0.946	0.702
DASS10	DASS Depression	1.163	0.859
DASS13	DASS Depression	0.979	0.759
DASS16	DASS Depression	1.064	0.839
DASS17	DASS Depression	1.187	0.885
DASS21	DASS Depression	0.908	0.766
DASS1	DASS Stress	1	0.471
DASS6	DASS Stress	1.726	0.751
DASS8	DASS Stress	1.592	0.718
DASS11	DASS Stress	1.642	0.735
DASS12	DASS Stress	1.573	0.655
DASS14	DASS Stress	1.528	0.664
DASS18	DASS Stress	1.462	0.645

Internet Sample – factor loadings for quadripartite model with correlated factors

Item	Scale	Unstandardised	Standardised
DASS2	DASS Anxiety	1	0.013
DASS4	DASS Anxiety	-17.57	-0.253
DASS7	DASS Anxiety	-17.537	-0.237
DASS9	DASS Anxiety	-39.679	-0.435
DASS15	DASS Anxiety	-42.826	-0.529
DASS19	DASS Anxiety	-28.354	-0.344
DASS20	DAS Anxiety	-66.462	-0.802

Item	Scale	Unstandardised	Standardised
DASS3	DASS Depression	1	0.525
DASS5	DASS Depression	0.894	0.428
DASS10	DASS Depression	1.028	0.49
DASS13	DASS Depression	0.818	0.409
DASS16	DASS Depression	1.264	0.641
DASS17	DASS Depression	1.346	0.646
DASS21	DASS Depression	1.077	0.585
DASS1	DASS Stress	1	0.13
DASS6	DASS Stress	-3.27	-0.394
DASS8	DASS Stress	-0.514	-0.064
DASS11	DASS Stress	-2.562	-0.318
DASS12	DASS Stress	-0.26	-0.03
DASS14	DASS Stress	-1.781	-0.214
DASS18	DASS Stress	-5.692	-0.695
DASS2	General Psychological Distress	1	0.587
DASS4	General Psychological Distress	0.97	0.626
DASS9	General Psychological Distress	1.152	0.567
DASS15	General Psychological Distress	1.27	0.705
DASS19	General Psychological Distress	0.962	0.524
DASS20	General Psychological Distress	0.876	0.475
DASS3	General Psychological Distress	1.115	0.623
DASS5	General Psychological Distress	1.09	0.555
DASS10	General Psychological Distress	1.388	0.704
DASS13	General Psychological Distress	1.203	0.64
DASS16	General Psychological Distress	1.05	0.567
DASS17	General Psychological Distress	1.21	0.618
DASS21	General Psychological Distress	0.904	0.523
DASS1	General Psychological Distress	0.984	0.583
DASS6	General Psychological Distress	1.185	0.648
DASS8	General Psychological Distress	1.329	0.755
DASS11	General Psychological Distress	1.184	0.667
DASS12	General Psychological Distress	1.324	0.693
DASS14	General Psychological Distress	1.14	0.623
DASS18	General Psychological Distress	0.801	0.445
DASS7	General Psychological Distress	1.094	0.662

Student sample – Factor loadings using EFA

	Pattern Matrix			Structure Matrix		
	Component			Component		
	1	2	3	1	2	3
DASS1	-.121	.049	.807	.271	.348	.774
DASS2	.051	-.093	.627	.287	.215	.609
DASS3	.654	.081	.158	.767	.492	.491
DASS4	-.032	.860	-.104	.369	.797	.268
DASS5	.573	-.018	.046	.584	.301	.297
DASS6	.284	.330	.260	.574	.595	.537
DASS7	-.017	.786	.056	.418	.802	.401
DASS8	.059	.750	.049	.472	.803	.413
DASS9	.246	.460	.051	.509	.611	.369
DASS10	.871	-.014	-.100	.818	.395	.289
DASS11	.316	.345	.325	.643	.655	.623
DASS12	.048	.244	.667	.477	.568	.798
DASS13	.659	.040	.185	.763	.466	.502
DASS14	.370	.053	.427	.591	.437	.619
DASS15	.021	.700	.230	.490	.814	.554
DASS16	.727	.011	.139	.795	.452	.473
DASS17	.791	.035	-.027	.797	.435	.348
DASS18	.340	.184	.476	.652	.575	.713
DASS19	-.109	.889	-.028	.341	.819	.322
DASS20	.442	.474	-.103	.643	.658	.311
DASS21	.891	-.046	-.121	.812	.363	.262

Student sample – Correlations between DASS subscales from EFA

Component Correlation Matrix

Component	1	2	3
1	1.000	.521	.454
2	.521	1.000	.449
3	.454	.449	1.000

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

Student Sample – original model with correlated factors

Item	Scale	Unstandardised	Standardised
DASS Anxiety	General Psychological Distress	0.281	0.881
DASS Depression	General Psychological Distress	0.5	0.809
DASS Stress	General Psychological Distress	0.487	1.024
DASS2	DASS Anxiety	1	0.356
DASS4	DASS Anxiety	1.591	0.662
DASS7	DASS Anxiety	2.152	0.735
DASS9	DASS Anxiety	1.811	0.614
DASS15	DASS Anxiety	2.493	0.824
DASS19	DASS Anxiety	1.871	0.693
DASS20	DASS Anxiety	1.591	0.676
DASS3	DASS Depression	1	0.789
DASS5	DASS Depression	0.802	0.538
DASS10	DASS Depression	1.106	0.759
DASS13	DASS Depression	1.107	0.751
DASS16	DASS Depression	1.078	0.804
DASS17	DASS Depression	0.936	0.712
DASS21	DASS Depression	0.863	0.699
DASS1	DASS Stress	1	0.483
DASS6	DASS Stress	1.343	0.701
DASS8	DASS Stress	1.373	0.699
DASS11	DASS Stress	1.622	0.818
DASS12	DASS Stress	1.501	0.722
DASS14	DASS Stress	1.259	0.659
DASS18	DASS Stress	1.515	0.793

Student Sample – quadripartite model with correlated factors

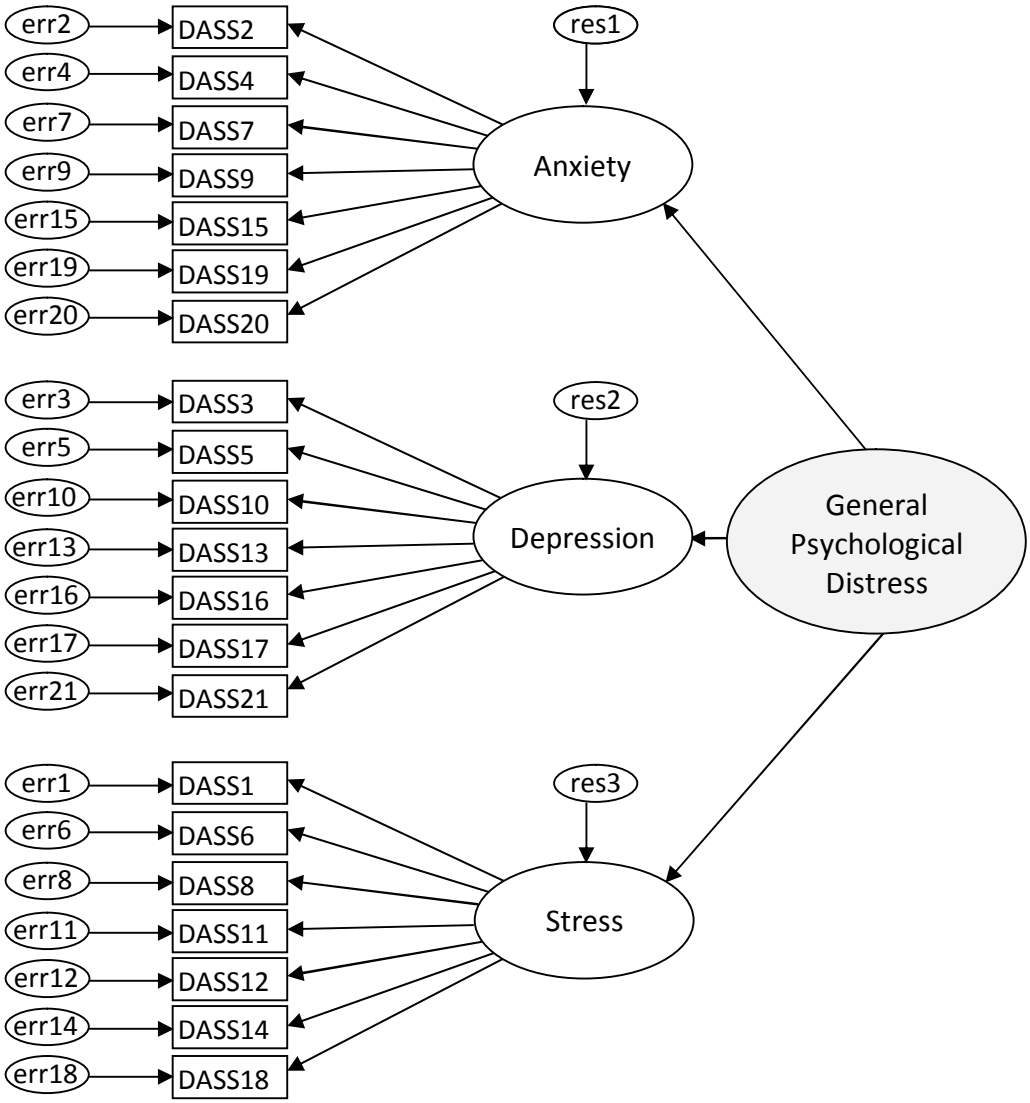
Item	Scale	Unstandardised	Standardised
DASS2	DASS Anxiety	1	0.026
DASS4	DASS Anxiety	-16.417	-0.505
DASS7	DASS Anxiety	-15.732	-0.398
DASS9	DASS Anxiety	-5.71	-0.143
DASS15	DASS Anxiety	-11.832	-0.29
DASS19	DASS Anxiety	-21.567	-0.591
DASS20	DAS Anxiety	-6.056	-0.19

Item	Scale	Unstandardised	Standardised
DASS3	DASS Depression	1	0.398
DASS5	DASS Depression	0.84	0.284
DASS10	DASS Depression	1.62	0.561
DASS13	DASS Depression	0.886	0.303
DASS16	DASS Depression	1.261	0.474
DASS17	DASS Depression	0.821	0.315
DASS21	DASS Depression	1.167	0.477
DASS1	DASS Stress	1	0.014
DASS6	DASS Stress	2.317	0.034
DASS8	DASS Stress	-35.785	-0.514
DASS11	DASS Stress	-2.186	-0.031
DASS12	DASS Stress	3.111	0.042
DASS14	DASS Stress	16.333	0.241
DASS18	DASS Stress	15.143	0.223
DASS2	General Psychological Distress	1	0.384
DASS4	General Psychological Distress	1.255	0.563
DASS9	General Psychological Distress	1.611	0.588
DASS15	General Psychological Distress	2.131	0.76
DASS19	General Psychological Distress	1.404	0.561
DASS20	General Psychological Distress	1.415	0.648
DASS3	General Psychological Distress	1.522	0.667
DASS5	General Psychological Distress	1.222	0.455
DASS10	General Psychological Distress	1.502	0.573
DASS13	General Psychological Distress	1.786	0.673
DASS16	General Psychological Distress	1.599	0.662
DASS17	General Psychological Distress	1.464	0.619
DASS21	General Psychological Distress	1.193	0.537
DASS1	General Psychological Distress	1.383	0.482
DASS6	General Psychological Distress	1.843	0.696
DASS8	General Psychological Distress	1.932	0.712
DASS11	General Psychological Distress	2.192	0.798
DASS12	General Psychological Distress	2.06	0.715
DASS14	General Psychological Distress	1.801	0.681
DASS18	General Psychological Distress	2.142	0.81
DASS7	General Psychological Distress	1.761	0.649

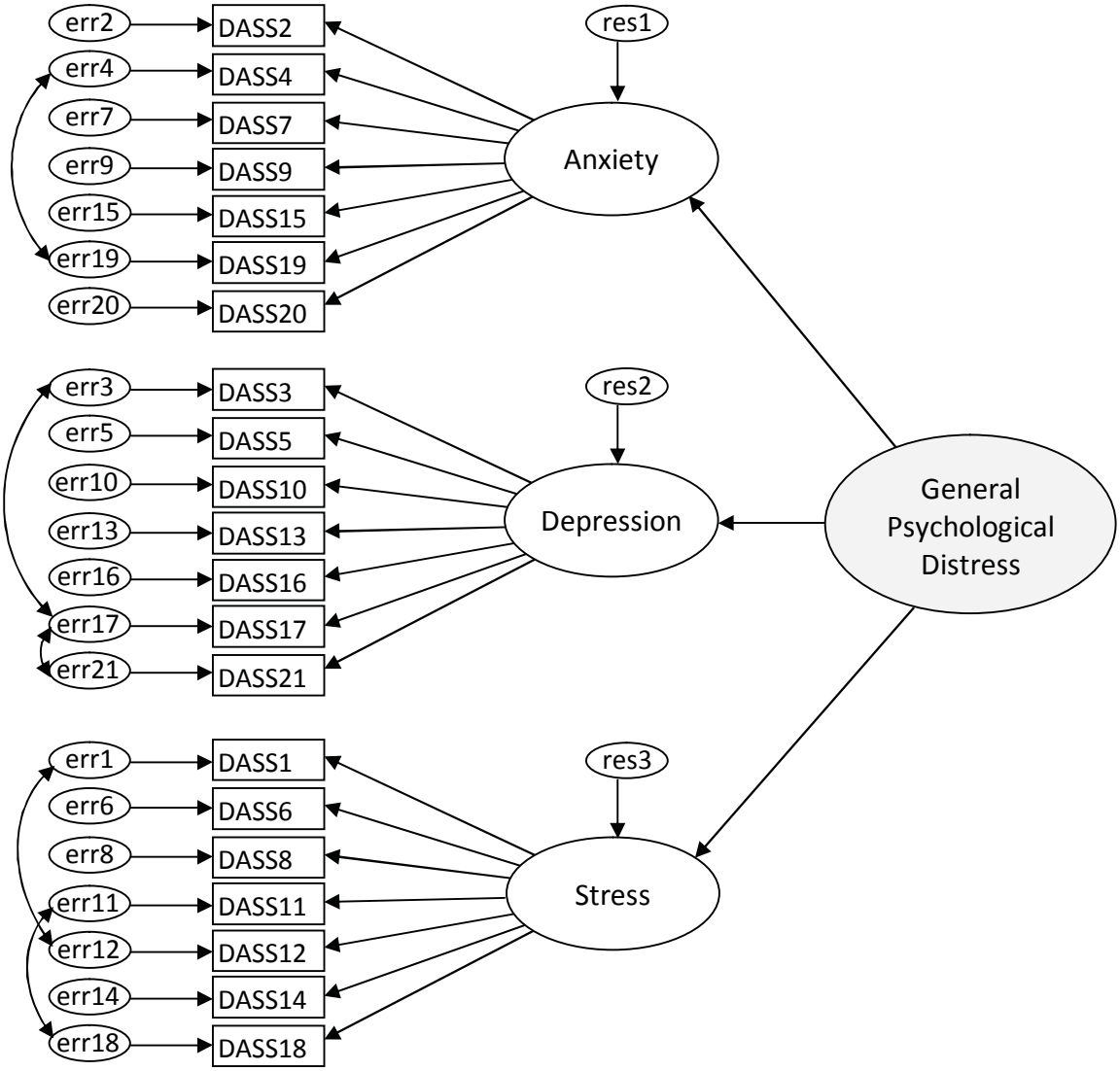
CFA results for student and internet samples – original and quadripartite model with limited correlated errors

	Student		Internet	
	Original model	Quadripartite model	Original model	Quadripartite model
χ^2	357	260	330	270
df	181	160	181	160
χ^2/df	1.97	1.62	1.82	1.68
TLI	0.91	0.94	0.91	0.92
CFI	0.92	0.96	0.92	0.94
RMSEA	0.070	0.056	0.077	0.070

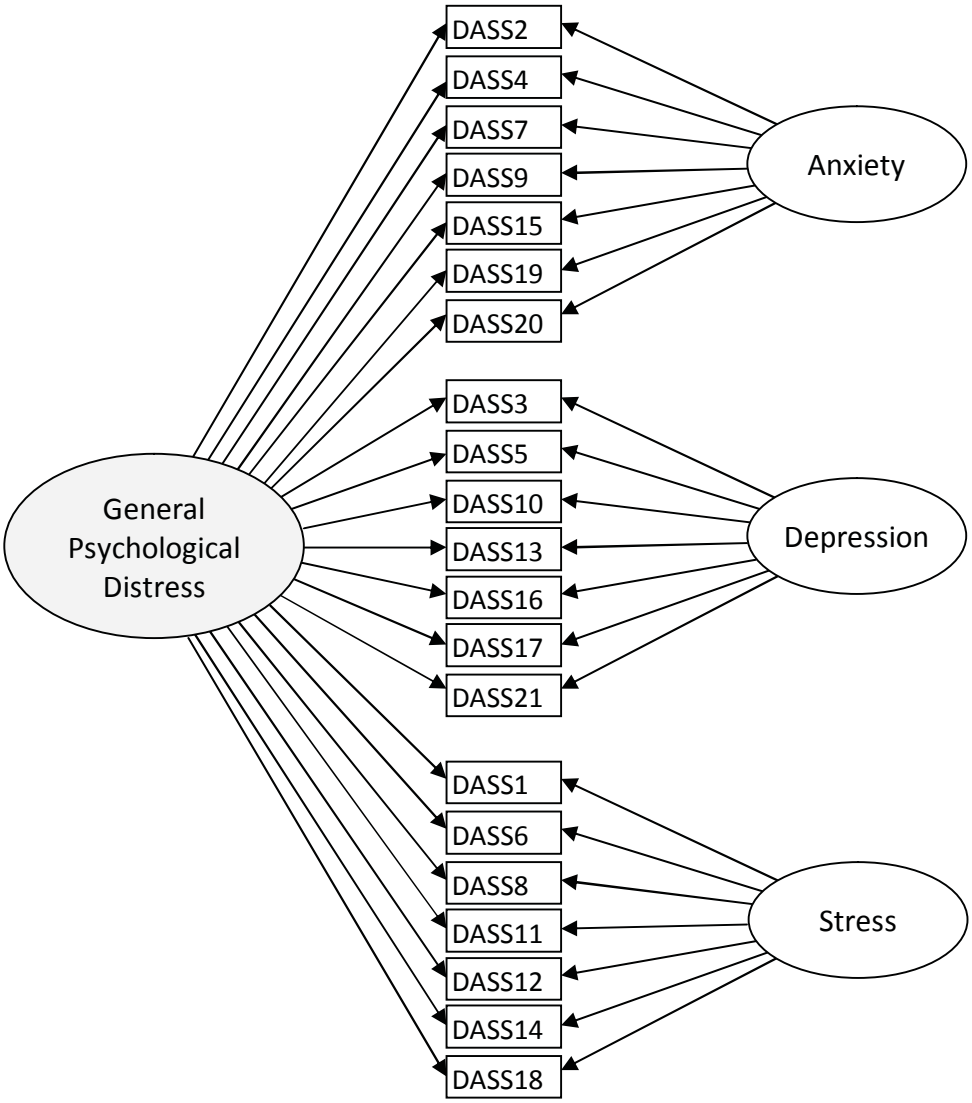
Appendix E: DASS CFA models



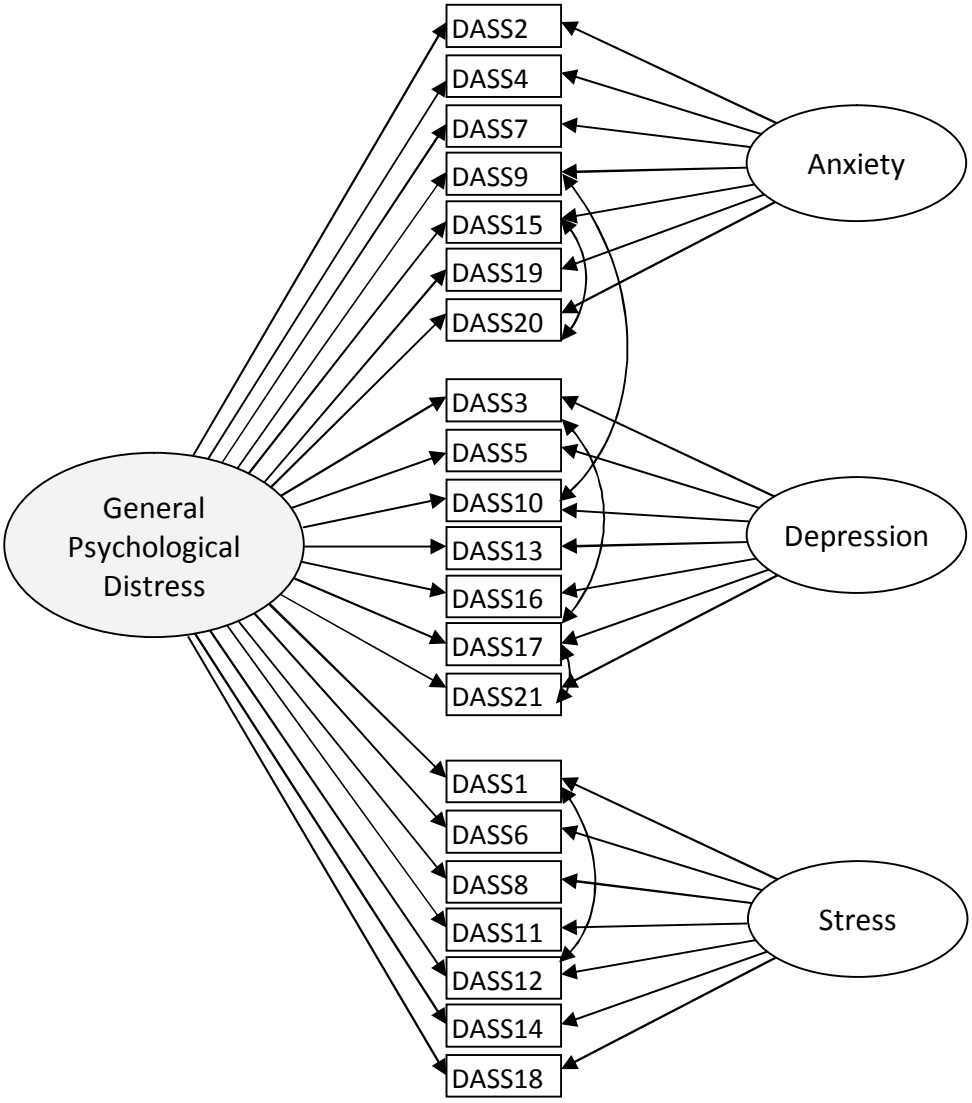
Original model with correlated factors



Original model with correlated factors and correlated errors



Quadripartite model (residuals not shown to enhance readability).



Quadripartite model plus correlated errors (error terms not shown to enhance readability. Correlations are between errors, not factors).

Appendix F: Descriptive statistics for student and internet sample (first stage)

Internet sample

	Minimum	Maximum	*M*	*SD*	Skewness	Kurtosis
Age	16	61	27.10	9.644	1.356	1.455
Population	1	5	2.96	1.236	-.001	-.870
Risks to belongings	6	30	18.09	5.250	-.029	-.697
Unknown risks	6	30	19.11	4.935	-.166	-.294
Risks involving personal danger	6	27	15.67	4.662	.106	-.882
Risks to others	6	25	10.91	4.018	1.146	1.600
Social risks	6	30	19.90	4.402	-.339	.067
Health risks	6	28	17.32	4.795	-.116	-.481
Everyday risks	38	150	101.00	20.826	-.284	-.306
GSD	0	126	42.64	29.173	.543	-.403
Anxiety Level	1	4	2.41	1.326	.064	-1.776
Depression Level	1	4	2.29	1.307	.263	-1.689
Stress Level	1	4	2.27	1.230	.265	-1.554

Student sample

	Minimum	Maximum	*M*	*SD*	Skewness	Kurtosis
Age	17	64	21.83	8.784	3.059	8.995
Income	1	4	1.08	.391	5.887	36.919
Population	1	4	3.03	.947	-.629	-.587
Risks to belongings	10	30	19.53	4.002	-.008	-.338
Unknown risks	12	30	21.38	3.974	-.211	-.604
Risks involving personal danger	8	27	17.66	4.417	-.070	-.604
Risks to others	6	25	11.94	3.296	.569	.592
Social risks	11	30	21.16	3.545	.085	-.089
Health risks	9	28	19.32	4.172	-.048	-.640
Everyday risks	64	153	110.98	16.939	-.055	-.281
GSD	0	120	30.85	24.873	1.169	1.008
Anxiety Level	1	4	1.95	1.210	.715	-1.188
Depression Level	1	4	1.76	1.081	1.046	-.432
Stress Level	1	4	1.76	1.113	1.083	-.417

Appendix G: Results from ANCOVA analysis – for non-linear affects of anxiety and depression levels.

Unknown risks

Source	*SS*	*df*	*MS*	*F*	*p*
Corrected Model	2231.883[a]	16	139.493	6.947	.000
Intercept	52292.554	1	52292.554	2604.422	.000
Age	1908.066	1	1908.066	95.031	.000
Anxiety level	74.229	3	24.743	1.232	.297
Depression Level	169.824	3	56.608	2.819	.038
Anxiety level * Depression Level	181.495	9	20.166	1.004	.435
Error	12548.985	625	20.078		
Total	256179.000	642			
Corrected Total	14780.868	641			

a. r^2 = .151 (Adjusted r^2 = .129)

(I) Depression Level	(J) Depression Level	Mean Difference (I-J)	*SE*	*p*
1	2	-.131	.743	.860
	3	-1.233	.660	.062
	4	1.408	.872	.107
2	1	.131	.743	.860
	3	-1.102	.817	.178
	4	1.539	.991	.121
3	1	1.233	.660	.062
	2	1.102	.817	.178
	4	2.642	.935	.005
4	1	-1.408	.872	.107
	2	-1.539	.991	.121
	3	-2.642	.935	.005

Risks involving personal danger

Source	*SS*	*df*	*MS*	*F*	*p*
Corrected Model	2425.875[a]	16	151.617	7.322	.000
Intercept	37700.958	1	37700.958	1820.718	.000
Age	1952.597	1	1952.597	94.298	.000
Anxiety level	49.212	3	16.404	.792	.498
Depression Level	185.661	3	61.887	2.989	.031
Anxiety level * Depression Level	328.971	9	36.552	1.765	.072
Error	12941.653	625	20.707		
Total	176757.000	642			
Corrected Total	15367.528	641			

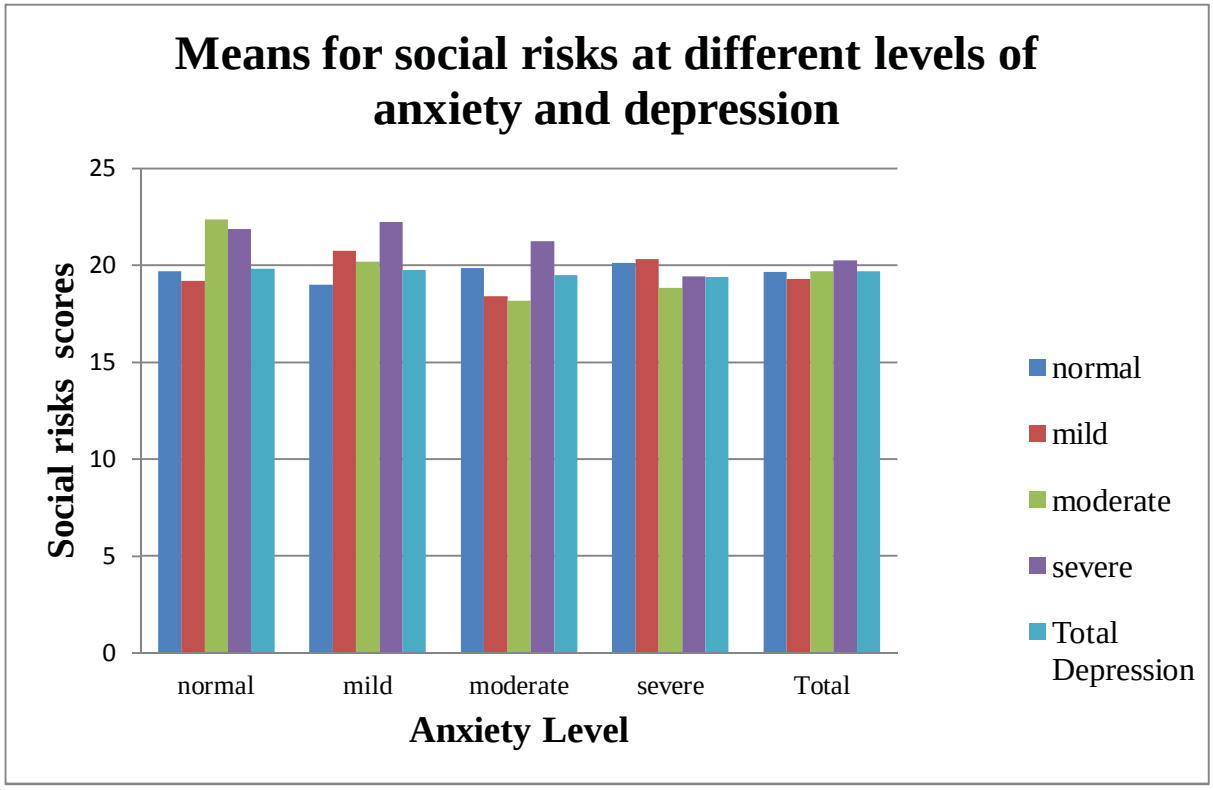
a. r^2 = .158 (Adjusted r^2 = .136)

(I) depression level	(J) depression level	Mean Difference (I-J)	*SE*	*p*
1	2	-.988	.755	.191
	3	-1.299	.671	.053
	4	1.221	.886	.168
2	1	.988	.755	.191
	3	-.311	.830	.708
	4	2.210	1.006	.028
3	1	1.299	.671	.053
	2	.311	.830	.708
	4	2.520	.949	.008
4	1	-1.221	.886	.168
	2	-2.210	1.006	.028
	3	-2.520	.949	.008

Social risks

Source	*SS*	*df*	*MS*	*F*	*p*
Corrected Model	1940.139[a]	16	121.259	8.809	.000
Intercept	54127.512	1	54127.512	3932.205	.000
Age	1531.956	1	1531.956	111.292	.000
Anxiety level	93.732	3	31.244	2.270	.079
Depression Level	19.227	3	6.409	.466	.706
Anxiety level * Depression Level	284.833	9	31.648	2.299	.015
Error	8603.238	625	13.765		
Total	259642.000	642			
Corrected Total	10543.377	641			

a. r^2 = .184 (Adjusted r^2 = .163)



Means for each level of anxiety and depression (for social risks).

Health risks

Source	*SS*	*df*	*MS*	*F*	*p*
Corrected Model	2159.114[a]	16	134.945	6.331	.000
Intercept	43101.765	1	43101.765	2022.063	.000
Age	1621.875	1	1621.875	76.088	.000
Anxiety level	174.629	3	58.210	2.731	.043
Depression Level	24.501	3	8.167	.383	.765
Anxiety level * Depression Level	231.974	9	25.775	1.209	.286
Error	13322.339	625	21.316		
Total	217379.000	642			
Corrected Total	15481.453	641			

a. r^2 = .139 (Adjusted r^2 = .117)

(I) Anxiety level	(J) Anxiety level	Mean Difference (I-J)	*SE*	*p*
1	2	2.367	.979	.016
	3	1.137	.736	.123
	4	1.796	.763	.019
2	1	-2.367	.979	.016
	3	-1.230	.958	.200
	4	-.571	.979	.560
3	1	-1.137	.736	.123
	2	1.230	.958	.200
	4	.659	.736	.371
4	1	-1.796	.763	.019
	2	.571	.979	.560
	3	-.659	.736	.371

Appendix H: Results from analysis of categorical variables

Relationship Status

Differences between relationship types – ANOVA analysis

		SS	*df*	*MS*	*F*	*p*
Everyday risks	Between Groups	21937.302	2	10968.651	26.949	.000
	Within Groups	261711.020	643	407.016		
	Total	283648.322	645			
Risks to belongings	Between Groups	102.013	2	51.006	2.237	.108
	Within Groups	14662.775	643	22.804		
	Total	14764.788	645			
Unknown risks	Between Groups	789.288	2	394.644	17.949	.000
	Within Groups	14137.647	643	21.987		
	Total	14926.935	645			
Risks involving personal danger	Between Groups	1093.798	2	546.899	24.360	.000
	Within Groups	14436.011	643	22.451		
	Total	15529.810	645			
Risks to others	Between Groups	204.420	2	102.210	8.243	.000
	Within Groups	7972.814	643	12.399		
	Total	8177.234	645			
Social risks	Between Groups	1156.229	2	578.115	38.391	.000
	Within Groups	9682.564	643	15.058		
	Total	10838.793	645			
Health risks	Between Groups	861.269	2	430.635	18.716	.000
	Within Groups	14794.429	643	23.008		
	Total	15655.698	645			

Dependent Variable	(I) relationship	(J) relationship	Mean Difference (I-J)	*SE*	*p*
Everyday risks	single	married	12.618*	1.791	.000
		other	1.378	2.132	.518
	married	single	-12.618*	1.791	.000
		other	-11.240*	2.230	.000
	other	single	-1.378	2.132	.518
		married	11.240*	2.230	.000

Dependent Variable	(I) relationship	(J) relationship	Mean Difference (I-J)	*SE*	*p*
Risks to belongings	single	married	.895*	.424	.035
		other	.330	.505	.513
	married	single	-.895*	.424	.035
		other	-.565	.528	.285
	other	single	-.330	.505	.513
		married	.565	.528	.285
Unknown risks	single	married	2.271*	.416	.000
		other	-.158	.495	.750
	married	single	-2.271*	.416	.000
		other	-2.429*	.518	.000
	other	single	.158	.495	.750
		married	2.429*	.518	.000
Risks involving personal danger	single	married	2.865*	.421	.000
		other	.530	.501	.290
	married	single	-2.865*	.421	.000
		other	-2.334*	.524	.000
	other	single	-.530	.501	.290
		married	2.334*	.524	.000
Risks to others	single	married	1.205*	.313	.000
		other	.080	.372	.831
	married	single	-1.205*	.313	.000
		other	-1.125*	.389	.004
	other	single	-.080	.372	.831
		married	1.125*	.389	.004
Social risks	single	married	2.951*	.344	.000
		other	.576	.410	.161
	married	single	-2.951*	.344	.000
		other	-2.375*	.429	.000
	other	single	-.576	.410	.161
		married	2.375*	.429	.000
Health risks	single	married	2.432*	.426	.000
		other	.020	.507	.969
	married	single	-2.432*	.426	.000
		other	-2.412*	.530	.000
	other	single	-.020	.507	.969
		married	2.412*	.530	.000

*. The mean difference is significant at the 0.05 level.

ANOVA of relationship type and other socio-demographic variables.

		SS	*df*	*MS*	*F*	*p*
Age * Relationship	Between Groups	64111.999	2	32055.999	144.106	.000
	Within Groups	141698.487	637	222.447		
	Total	205810.486	639			
Gender * Relationship	Between Groups	2.609	2	1.304	5.768	.003
	Within Groups	144.961	641	.226		
	Total	147.570	643			
Qualification * Relationship	Between Groups	4.219	2	2.110	9.553	.000
	Within Groups	141.562	641	.221		
	Total	145.781	643			
Children * Relationship	Between Groups	22.490	2	11.245	80.210	.000
	Within Groups	89.863	641	.140		
	Total	112.352	643			
Income * Relationship	Between Groups	174.729	2	87.364	89.252	.000
	Within Groups	482.576	493	.979		
	Total	657.304	495			
Population * Relationship	Between Groups	7.477	2	3.739	3.138	.044
	Within Groups	749.445	629	1.191		
	Total	756.922	631			

Source	*SS*	*df*	*MS*	*F*	*p*
Corrected Model	54147.561[a]	4	13536.890	40.045	.000
Intercept	716540.841	1	716540.841	2119.675	.000
Age	29893.822	1	29893.822	88.432	.000
Income	7777.721	1	7777.721	23.008	.000
Relationship	3087.798	2	1543.899	4.567	.011
Error	164288.761	486	338.043		
Total	5481153.000	491			
Corrected Total	218436.322	490			

a. r^2 = .248 (Adjusted r^2 = .242)

Employment Status

Differences in RTB between employment status' – ANOVA analysis

		SS	*df*	*MS*	*F*	*p*
Everyday risks	Between Groups	22296.856	3	7432.285	18.238	.000
	Within Groups	261219.724	641	407.519		
	Total	283516.580	644			
Risks to belongings	Between Groups	541.275	3	180.425	8.092	.000
	Within Groups	14291.863	641	22.296		
	Total	14833.138	644			
Unknown risks	Between Groups	1501.893	3	500.631	23.911	.000
	Within Groups	13421.059	641	20.938		
	Total	14922.952	644			
Risks involving personal danger	Between Groups	917.732	3	305.911	13.413	.000
	Within Groups	14618.820	641	22.806		
	Total	15536.552	644			
Risks to others	Between Groups	126.780	3	42.260	3.292	.020
	Within Groups	8227.397	641	12.835		
	Total	8354.177	644			
Social risks	Between Groups	709.928	3	236.643	15.047	.000
	Within Groups	10081.033	641	15.727		
	Total	10790.961	644			
Health risks	Between Groups	619.121	3	206.374	8.818	.000
	Within Groups	15002.082	641	23.404		
	Total	15621.203	644			

Multiple Comparisons

Dependent Variable	(I) employment	(J) employment	Mean Difference (I-J)	*SE*	*p*
Everyday risks	Not working	Full time	-14.653*	2.605	.000
		Part time	-12.897*	2.490	.000
		Student	-17.820*	2.448	.000
	Full time	Not working	14.653*	2.605	.000
		Part time	1.756	2.218	.429
		Student	-3.167	2.171	.145
	Part time	Not working	12.897*	2.490	.000
		Full time	-1.756	2.218	.429
		Student	-4.923*	2.031	.016
	Student	Not working	17.820*	2.448	.000
		Full time	3.167	2.171	.145
		Part time	4.923*	2.031	.016

Dependent Variable	(I) employment	(J) employment	Mean Difference (I-J)	*SE*	*p*
Risks to belongings	Not working	Full time	-2.863*	.609	.000
		Part time	-2.308*	.583	.000
		Student	-2.228*	.573	.000
	Full time	Not working	2.863*	.609	.000
		Part time	.555	.519	.285
		Student	.635	.508	.211
	Part time	Not working	2.308*	.583	.000
		Full time	-.555	.519	.285
		Student	.080	.475	.867
	Student	Not working	2.228*	.573	.000
		Full time	-.635	.508	.211
		Part time	-.080	.475	.867
Unknown risks	Not working	Full time	-4.035*	.591	.000
		Part time	-2.755*	.565	.000
		Student	-4.456*	.555	.000
	Full time	Not working	4.035*	.591	.000
		Part time	1.280*	.503	.011
		Student	-.420	.492	.393
	Part time	Not working	2.755*	.565	.000
		Full time	-1.280*	.503	.011
		Student	-1.701*	.460	.000
	Student	Not working	4.456*	.555	.000
		Full time	.420	.492	.393
		Part time	1.701*	.460	.000
Risks involving personal danger	Not working	Full time	-2.383*	.616	.000
		Part time	-2.574*	.589	.000
		Student	-3.668*	.579	.000
	Full time	Not working	2.383*	.616	.000
		Part time	-.190	.525	.717
		Student	-1.285*	.514	.013
	Part time	Not working	2.574*	.589	.000
		Full time	.190	.525	.717
		Student	-1.094*	.481	.023
	Student	Not working	3.668*	.579	.000
		Full time	1.285*	.514	.013
		Part time	1.094*	.481	.023

Dependent Variable	(I) employment	(J) employment	Mean Difference (I-J)	*SE*	*p*
Risks to others	Not working	Full time	-.999*	.462	.031
		Part time	-1.183*	.442	.008
		Student	-1.306*	.434	.003
	Full time	Not working	.999*	.462	.031
		Part time	-.184	.394	.640
		Student	-.307	.385	.426
	Part time	Not working	1.183*	.442	.008
		Full time	.184	.394	.640
		Student	-.123	.361	.733
	Student	Not working	1.306*	.434	.003
		Full time	.307	.385	.426
		Part time	.123	.361	.733
Social risks	Not working	Full time	-2.042*	.512	.000
		Part time	-1.745*	.489	.000
		Student	-3.188*	.481	.000
	Full time	Not working	2.042*	.512	.000
		Part time	.297	.436	.496
		Student	-1.145*	.426	.007
	Part time	Not working	1.745*	.489	.000
		Full time	-.297	.436	.496
		Student	-1.442*	.399	.000
	Student	Not working	3.188*	.481	.000
		Full time	1.145*	.426	.007
		Part time	1.442*	.399	.000
Health risks	Not working	Full time	-2.330*	.624	.000
		Part time	-2.332*	.597	.000
		Student	-2.975*	.587	.000
	Full time	Not working	2.330*	.624	.000
		Part time	-.002	.532	.997
		Student	-.645	.520	.216
	Part time	Not working	2.332*	.597	.000
		Full time	.002	.532	.997
		Student	-.643	.487	.187
	Student	Not working	2.975*	.587	.000
		Full time	.645	.520	.216
		Part time	.643	.487	.187

ANOVA of employment status and other socio-demographic variables.

		SS	*df*	*MS*	*F*	*p*
Age	Between Groups	82209.479	3	27403.160	144.061	.000
	Within Groups	120789.284	635	190.219		
	Total	202998.764	638			
Gender	Between Groups	8.590	3	2.863	13.252	.000
	Within Groups	137.853	638	.216		
	Total	146.442	641			
Qualification	Between Groups	11.311	3	3.770	17.893	.000
	Within Groups	134.654	639	.211		
	Total	145.966	642			
Children	Between Groups	6.426	3	2.142	12.928	.000
	Within Groups	105.875	639	.166		
	Total	112.302	642			
Income	Between Groups	341.181	3	113.727	176.283	.000
	Within Groups	316.117	490	.645		
	Total	657.298	493			
Population	Between Groups	5.757	3	1.919	1.603	.187
	Within Groups	749.203	626	1.197		
	Total	754.960	629			

Source	*SS*	*df*	*MS*	*F*	*p*
Corrected Model	52808.455[a]	5	10561.691	30.958	.000
Intercept	591155.738	1	591155.738	1732.769	.000
Age	25409.412	1	25409.412	74.479	.000
income	696.866	1	696.866	2.043	.154
employment	2426.975	3	808.992	2.371	.070
Error	164781.496	483	341.163		
Total	5467375.000	489			
Corrected Total	217589.951	488			

a. r^2 = .243 (Adjusted r^2 = .235)

Nationality

		SS	*df*	*MS*	*F*	*p*
Age * Nationality	Between Groups	8419.532	1	8419.532	26.640	.000
	Within Groups	192159.269	608	316.051		
	Total	200578.802	609			
Gender * Nationality	Between Groups	2.632	1	2.632	11.556	.001
	Within Groups	139.376	612	.228		
	Total	142.008	613			
Qualification * Nationality	Between Groups	.532	1	.532	2.349	.126
	Within Groups	138.456	611	.227		
	Total	138.989	612			
Children * Nationality	Between Groups	.004	1	.004	.020	.889
	Within Groups	109.103	611	.179		
	Total	109.106	612			
Population * Nationality	Between Groups	3.019	1	3.019	2.569	.110
	Within Groups	703.979	599	1.175		
	Total	706.998	600			

Differences between ERI-E overall score.

		Without covariates		With covariates	
Nationality	*n*	*M*	*SD*	*M*	*SE*
New Zealand	504	103.32	21.027	104.016[a]	.848
United States	105	101.00	20.262	97.647[a]	1.891
Total	609	102.92	20.899		

a. Covariates appearing in the model are evaluated at the following values: Age = 35.81, Gender = 1.63.

Source	*SS*	*df*	*MS*	*F*	*p*
Corrected Model	48374.904[a]	3	16124.968	44.918	.000
Intercept	479345.303	1	479345.303	1335.273	.000
Age	47399.585	1	47399.585	132.037	.000
Gender	3847.004	1	3847.004	10.716	.001
Nationality	3340.502	1	3340.502	9.305	.002
Error	217186.991	605	358.987		
Total	6716147.000	609			
Corrected Total	265561.895	608			

a. r^2 = .182 (Adjusted r^2 = .178)

Ethnicity

		SS	*df*	*MS*	*F*	*p*
Age * Ethnicity	Between Groups	7084.189	2	3542.094	10.159	.000
	Within Groups	173989.214	499	348.676		
	Total	181073.402	501			
Gender * Ethnicity	Between Groups	.283	2	.141	.591	.554
	Within Groups	120.609	504	.239		
	Total	120.892	506			
Qualification * Ethnicity	Between Groups	.229	2	.114	.495	.610
	Within Groups	116.179	502	.231		
	Total	116.408	504			
Children * Ethnicity	Between Groups	.479	2	.239	1.344	.262
	Within Groups	89.414	502	.178		
	Total	89.893	504			
Income * Ethnicity	Between Groups	10.090	2	5.045	3.843	.022
	Within Groups	647.215	493	1.313		
	Total	657.304	495			
Population * Ethnicity	Between Group	5.099	2	2.550	2.312	.100
	Within Groups	541.559	491	1.103		
	Total	546.658	493			

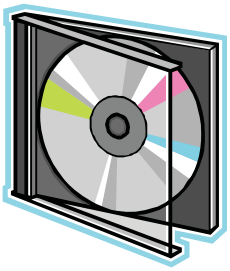
Source	*SS*	*df*	*MS*	*F*	*p*
Corrected Model	68376.005[a]	7	9768.001	31.440	.000
Intercept	941414.795	1	941414.795	3030.137	.000
Age	57311.431	1	57311.431	184.469	.000
income	4069.725	1	4069.725	13.099	.000
Gender	1030.349	1	1030.349	3.316	.069
Ethnicity	15398.499	2	7699.249	24.782	.000
Gender * Ethnicity	56.081	2	28.041	.090	.914
Error	150060.317	483	310.684		
Total	5481153.000	491			
Corrected Total	218436.322	490			

a. r^2 = .313 (Adjusted r^2 = .303)

Appendix I: Handouts for Second Stage of Project

Do you avoid everyday risks?

Do you lock your house when home by yourself?



Would you lend your favourite CD to a friend?

Would you drive somewhere without directions?

Would you share a drink bottle with a friend?

I am a clinical psychology student at Massey University student conducting a study of whether people avoid the risks of everyday life, and how their thoughts might be related to their risk taking. I am also interested in whether people's avoidance of these risks is related to anxiety and depression. To participate in this research please fill in the following questionnaires. This should take you about 15 minutes.

Your assistance in helping with this research would be greatly appreciated

Demographic Information for Everyday Risk Avoidance Project

Can you please provide this information. The reason is so that comparisons can be made for different groups of people.

Age:

Gender: Male Female

Ethnicity: NZ Pakeha/European
Maori
Pacific Islander
Asian
Other (please specify)

Do you have a qualification from a university or polytechnic?

Yes No

Do you have dependent children?

Yes No

Relationship Status

Single Married Other relationship

Employment Status

Not working Part time Full time

Population of town/city you live in:

<5,000 5,000-20,000 20,000-100,000 >100,000

Everyday Risk Inventory – Expanded Version

Listed below are various activities that people sometimes do that involve some degree of risk. Please rate the extent to which you would be likely to do each of these things. Some of the items may not apply directly to your current situation. For example, you may not be married, but the question might refer to your spouse. In this case, if you can think of how you would respond if you were in that situation, please do, otherwise do not give an answer.

Please use the following scale:

1	2	3	4	5
I would never do this	I am unlikely to do this	I might do this	I would probably do this	I would definitely do this

_____ 1. Leave your car unlocked while going into a shop for a few minutes.

_____ 2. See a movie without knowing much about it.

_____ 3. Go on a holiday without a specific itinerary.

_____ 4. Eat meat that did not seem to be properly cooked.

_____ 5. Drink from a water fountain in a public place.

_____ 6. Go walking in a national park out of mobile phone coverage

_____ 7. Drink from a bottle used by a friend.

_____ 8. Pat an unfamiliar large dog in the park whose owner is not in sight.

_____ 9. Leave your drunk best friend at a bar.

_____ 10. Go out without a coat in cold weather.

_____ 11. Go out into the open ocean in a small boat.

_____ 12. Allow a stranger to come into your home to use your phone.

_____ 13. Drive in heavy rain to do an errand you could postpone.

_____ 14. Let a friend leave a bar to go home with someone she has just met.

_____ 15. Admit that your tastes are different to those of your friends.

_____ 16. Take a shortcut down a dark path at night.

_____ 17. Leave your house unlocked when you're home during the day.

1	2	3	4	5
I would never do this	I am unlikely to do this	I might do this	I would probably do this	I would definitely do this

_____ 18. Order a dish in a foreign restaurant when you don't know the ingredients.

_____ 19. Drive somewhere without directions.

_____ 20. Move to a city where you don't know many people.

_____ 21. Go on a date with a work colleague.

_____ 22. Disagree with a friend, knowing it could lead to an argument.

_____ 23. Leave your washing on the line shared with other houses/flats.

_____ 24. Let a female friend walk home alone at night.

_____ 25. Tell a friend the truth, even though it might upset them.

_____ 26. Change jobs to one that was more exciting but also unpredictable.

_____ 27. Lend your favourite book or CD to a friend.

_____ 28. Leave an unlocked bicycle outside your house.

_____ 29. Leave your jacket unattended in a bar.

_____ 30. Leave a small child at home alone while going out for a few minutes

_____ 31. Eat food that is just past its use by date.

_____ 32. Go flatting/boarding with people you don't know very well.

_____ 33. Wear clothes that may not be appropriate for the occasion (makes you stand out).

_____ 34. Sit directly on a public toilet seat.

_____ 35. Take a young child in a car without a proper child seat.

_____ 36. Leave a child with a babysitter recommended to you, but who you don't know personally.

There is a possibility that items in the following questionnaire may raise concerns for some people. If this is the case then contact Steve Humphries (s.a.humphries@massey.ac.nz), or ring a helpline to discuss the issues it has raised for you. Lifeline (0800-111-777) is a good option for telephone support.

DASS21

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

DAS

This questionnaire lists different attitudes or beliefs which people sometimes hold. Read *each* statement carefully and decide how much you agree or disagree with the statement.

For each of the attitudes, indicate to the left of the item the number that *best describes how you think.* Be sure to choose only one answer for each attitude. Because people are different, there is no right answer or wrong answer to these statements. Your answers are confidential, so please do not put your name on this sheet.

To decide whether a given attitude is typical of your way of looking at things, simply keep in mind what you are like *most of the time.*

1 = Totally agree

2 = Agree very much

3 = Agree slightly

4 = Neutral

5 = Disagree slightly

6 = Disagree very much

7 = Totally disagree

_____ 1. It is difficult to be happy unless one is good looking, intelligent, rich, and creative.

_____ 2. If I do not do well all the time, people will not respect me.

_____ 3. If a person asks for help, it is a sign of weakness.

_____ 4. If I do not do as well as other people, it means I am a weak person.

_____ 5. If I fail at my work, then I am a failure as a person.

_____ 6. If you cannot do something well, there is little point in doing it at all.

_____ 7. If someone disagrees with me, it probably indicates he does not like me.

_____ 8. If I fail partly, it is as bad as being a complete failure.

_____ 9. If other people know what you are really like, they will think less of you.

_____ 10. My value as a person depends greatly on what others think of me.

_____ 11. If I am to be a worthwhile person, I must be the best in at least one way.

_____ 12. If I ask a question, it makes me look stupid.

_____ 13. It is awful to be put down by people important to you.

_____ 14. If you don't have other people to lean on, you are going to be sad.

_____ 15. If others dislike you, you cannot be happy.

_____ 16. My happiness depends more on other people than it does on me.

_____ 17. What other people think about me is very important.

The Penn State Worry Questionnaire (PSWQ)

Instructions: Rate each of the following statements on a scale of 1 ("not at all typical of me") to 5 "very typical of me"). Please do not leave any items blank.

		Not at all typical of me				Very typical of me
1	If I do not have enough time to do everything, I do not worry about it.	1	2	3	4	5
2	My worries overwhelm me.	1	2	3	4	5
3	I do not tend to worry about things.	1	2	3	4	5
4	Many situations make me worry.	1	2	3	4	5
5	I know I should not worry about things, but I just cannot help it.	1	2	3	4	5
6	When I am under pressure I worry a lot.	1	2	3	4	5
7	I am always worrying about something.	1	2	3	4	5
8	I find it easy to dismiss worrisome thoughts.	1	2	3	4	5
9	As soon as I finish one task, I start to worry about everything else I have to do.	1	2	3	4	5
10	I never worry about anything.	1	2	3	4	5
11	When there is nothing more I can do about a concern, I do not worry about it any more.	1	2	3	4	5
12	I have been a worrier all my life.	1	2	3	4	5
13	I notice that I have been worrying about things.	1	2	3	4	5
14	Once I start worrying, I cannot stop.	1	2	3	4	5
15	I worry all the time.	1	2	3	4	5
16	I worry about projects until they are all done.	1	2	3	4	5

IUS

You will find below a series of statements which describe how people may react to the uncertainties of life. Please use the scale below to describe to what extent each item is characteristic of you. Please circle a number (1 to 5) that describes you best.

		Not at all characteristic of me		Somewhat characteristic of me		Entirely characteristic of me
1	Unforeseen events upset me greatly.	1	2	3	4	5
2	It frustrates me not having all the information I need.	1	2	3	4	5
3	Uncertainty keeps me from living a full life.	1	2	3	4	5
4	One should always look ahead so as to avoid surprises.	1	2	3	4	5
5	A small unforeseen event can spoil everything, even with the best of planning.	1	2	3	4	5
6	When it's time to act, uncertainty paralyses me.	1	2	3	4	5
7	When I am uncertain, I can't function very well.	1	2	3	4	5
8	I always want to know what the future has in store for me.	1	2	3	4	5
9	I can't stand being taken by surprise	1	2	3	4	5
10	The smallest doubt can stop me from acting	1	2	3	4	5
11	I should be able to organise everything in advance	1	2	3	4	5
12	I must get away from all uncertain situations.	1	2	3	4	5

Anxious Thoughts Inventory

Indicate how often each thought occurs by placing a circle around a number on the right hand side of the page

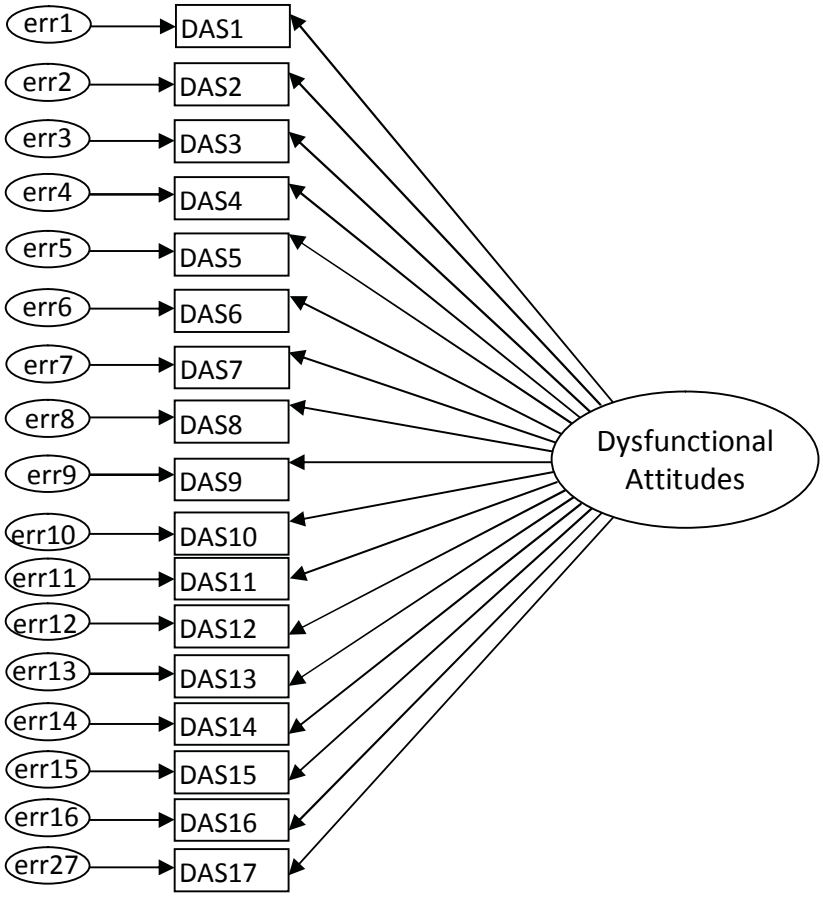
		Almost Never	Sometimes	Often	Almost always
1	I worry about my appearance	1	2	3	4
2	I think I am a failure	1	2	3	4
3	When looking to my future I give more thought to the negative things than the positive things that might happen to me.	1	2	3	4
4	If I experience unexpected physical symptoms I have a tendency to think the worst possible thing is wrong with me.	1	2	3	4
5	I have thoughts about becoming seriously ill.	1	2	3	4
6	I have difficulty in clearing my mind of repetitive thoughts	1	2	3	4
7	I worry about having a heart attack or cancer.	1	2	3	4
8	I worry about saying or doing wrong things when among strangers.	1	2	3	4
9	I worry about my abilities not living up to other people's expectations.	1	2	3	4
10	I worry about my physical health.	1	2	3	4
11	I worry that I cannot control my thoughts as well as I would like to.	1	2	3	4
12	I worry that people don't like me.	1	2	3	4
13	I take disappointments so keenly that I can't put them out of my mind.	1	2	3	4
14	I get embarrassed easily.	1	2	3	4
15	When I suffer from minor illnesses such as a rash I think it is more serious than it really is.	1	2	3	4
16	Unpleasant thoughts enter my head against my will.	1	2	3	4
17	I worry about my failures and my weaknesses.	1	2	3	4
18	I worry about not being able to cope with life as adequately as others seem to.	1	2	3	4
19	I worry about death.	1	2	3	4
20	I worry about making a fool of myself.	1	2	3	4
21	I think I am missing out on things in life because I worry too much.	1	2	3	4
22	I have repetitive thoughts such as counting or repeating phrases.	1	2	3	4

Appendix J: CFA results for DAS-A-17

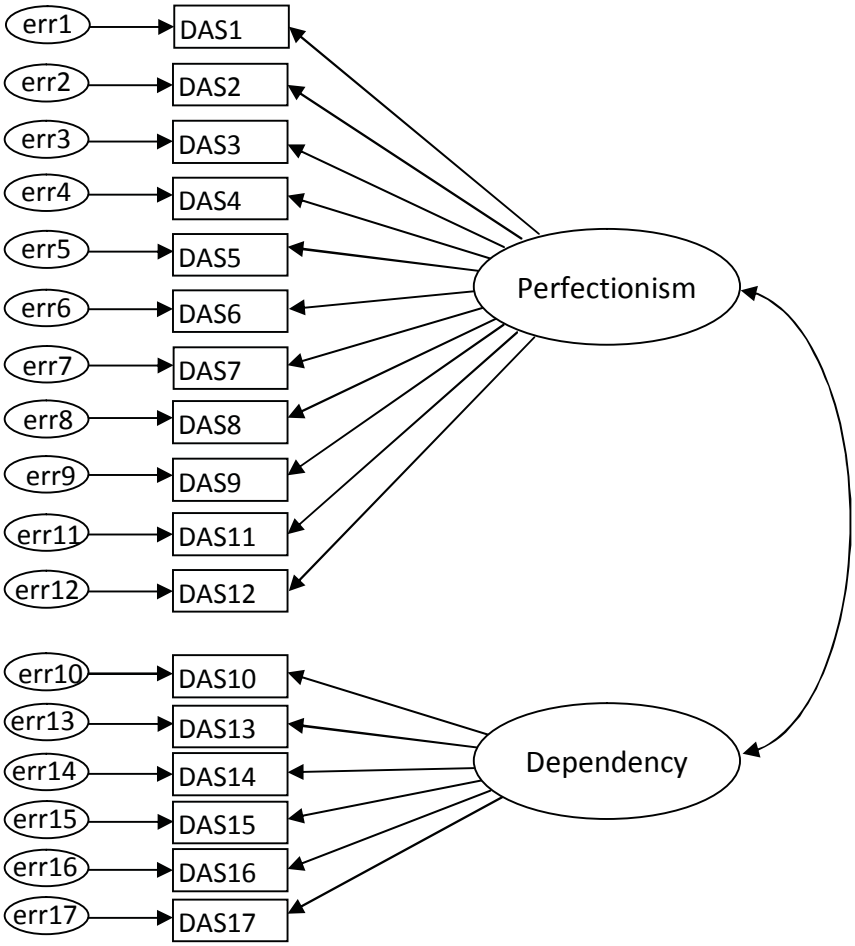
Descriptive statistics for items of the DAS-A-17 for internet sample (n=436).

	Minimum	Maximum	*M*	*SD*	Skewness	Kurtosis
DAS1	1	7	5.17	1.740	-.604	-.848
DAS2	1	7	4.28	1.861	-.006	-1.242
DAS3	1	7	5.89	1.503	-1.434	1.122
DAS4	1	7	4.85	1.992	-.332	-1.328
DAS5	1	7	4.82	2.103	-.414	-1.324
DAS6	1	7	4.62	2.030	-.304	-1.292
DAS7	1	7	5.29	1.626	-.748	-.523
DAS8	1	7	5.09	1.861	-.707	-.681
DAS9	1	7	4.73	2.039	-.364	-1.273
DAS10	1	7	4.72	1.962	-.356	-1.252
DAS11	1	7	4.17	2.044	.017	-1.351
DAS12	1	7	5.39	1.716	-.803	-.570
DAS13	1	7	1.93	1.340	2.109	4.659
DAS14	1	7	3.45	1.842	.480	-.780
DAS15	1	7	4.60	1.860	-.205	-1.142
DAS16	1	7	4.82	1.907	-.431	-1.051
DAS17	1	7	3.75	1.875	.306	-.978

One factor model for DAS-A-17



Two factor model



Factor loadings - Two factor DAS-A-17 model for internet sample.

Item	Scale	Unstandardised	Standardised
DAS1	Perfectionism	0.626	0.516
DAS2	Perfectionism	0.971	0.748
DAS3	Perfectionism	0.572	0.546
DAS4	Perfectionism	1.164	0.838
DAS5	Perfectionism	1.238	0.845
DAS6	Perfectionism	1.003	0.709
DAS7	Perfectionism	0.793	0.7
DAS8	Perfectionism	1.028	0.793
DAS9	Perfectionism	1	0.704
DAS11	Perfectionism	1	0.702
DAS12	Perfectionism	0.728	0.609
DAS10	Dependency	1	0.81
DAS13	Dependency	0.298	0.353
DAS14	Dependency	0.588	0.507
DAS15	Dependency	0.909	0.776
DAS16	Dependency	0.881	0.734
DAS17	Dependency	0.882	0.748

Factor loadings - One factor DAS-A-17 model for both samples.

Item	Unstandardised	Standardised	Unstandardised	Standardised
DAS1	0.619	0.522	0.779	0.57
DAS2	0.929	0.732	1.131	0.743
DAS3	0.537	0.524	0.541	0.474
DAS4	1.099	0.809	1.23	0.787
DAS5	1.165	0.813	1.339	0.829
DAS6	0.959	0.693	0.828	0.577
DAS7	0.788	0.711	0.531	0.504
DAS8	0.989	0.779	0.957	0.712
DAS9	1	0.719	1	0.605
DAS10	1.02	0.762	1.028	0.612
DAS11	0.989	0.709	1.12	0.665
DAS12	0.725	0.619	0.841	0.591
DAS13	0.294	0.321	0.378	0.302
DAS14	0.529	0.421	0.588	0.392
DAS15	0.862	0.68	0.91	0.575
DAS16	0.805	0.619	0.922	0.575
DAS17	0.759	0.594	0.815	0.525

Appendix K: Descriptive Statistics for second stage of research

Descriptive statistics for measures – Internet sample

	α	Minimum	Maximum	*M*	*SD*	Skewness	Kurtosis
Risks to belongings	.74	8	30	18.03	4.857	.174	-.554
Unknown risks	.68	8	30	18.93	4.521	-.076	-.440
Health risks	.68	6	30	16.19	4.969	.169	-.480
Risks involving personal danger	.73	6	30	17.29	4.739	-.041	-.551
Risks to others	.73	6	26	11.88	3.944	.473	-.276
Social risks	.65	7	28	16.72	3.996	.091	-.254
Everyday risks	.87	51	156	99.03	21.037	.022	-.400
DAS Perfectionism	.91	14	77	54.31	15.138	-.330	-.899
DAS Dependency	.83	6	42	23.27	7.957	-.016	-.528
DAS-A-17	.93	20	119	77.58	21.432	-.299	-.733
PSWQ	.94	17	80	58.22	14.736	-.473	-.590
IUS Prospective Anxiety	.85	7	35	21.97	5.999	.022	-.511
IUS Inhibitory Anxiety	.88	5	25	13.31	5.232	.409	-.535
IUS	.91	12	60	35.27	10.512	.255	-.474
AnTI Social worry	.91	9	36	21.68	6.971	.158	-.842
AnTI Metaworry	.89	6	24	11.92	4.542	.816	.102
AnTI Health worry	.87	7	28	16.01	5.705	.309	-.827
AnTI Total	.85	22	88	49.60	15.315	.271	-.711
Anxiety Level	.84	1	4	2.47	1.283	-.027	-1.698
Depression Level	.92	1	4	2.35	1.270	.166	-1.652
GSD	.87	0	126	45.28	28.561	.647	-.292

Descriptive statistics for measures – student sample

	α	Minimum	Maximum	*M*	*SD*	Skewness	Kurtosis
Risks to belongings	.54	8	28	19.00	3.840	-.038	-.452
Unknown risks	.71	10	30	21.50	4.333	-.174	-.632
Health risks	.64	7	27	18.82	4.313	-.278	-.606
Risks involving personal danger	.73	7	30	19.62	4.422	-.124	-.285
Risks to others	.62	6	23	14.31	3.468	-.007	-.553
Social risks	.63	9	27	18.57	3.816	.011	-.389
Everyday risks	.86	58	149	111.82	18.528	-.289	-.330
DAS Perfectionism	.89	22	77	59.99	11.845	-.698	-.145
DAS Dependency	.80	8	42	23.80	7.037	.180	-.283
DAS	.91	40	116	83.78	17.111	-.341	-.627
PSWQ	.94	18	80	49.16	14.415	-.055	-.805
IUS Prospective Anxiety	.84	7	33	18.26	5.342	.006	-.239
IUS Inhibitory Anxiety	.84	5	23	10.82	4.021	.358	-.464
IUS	.90	12	50	29.09	8.729	.041	-.661
AnTI Social worry	.89	10	36	19.00	5.862	.733	.052
AnTI Metaworry	.86	7	28	13.07	4.656	.875	.009
AnTI Health worry	.82	6	23	9.84	3.526	1.451	2.101
AnTI Total	.78	25	81	41.91	11.974	.808	.043
Anxiety Level	.76	1	4	1.75	1.129	1.060	-.537
Depression Level	.61	1	4	1.65	1.044	1.295	.152
GSD	.83	0	102	26.95	21.294	1.095	.679

Appendix L: Post Hoc analysis for scores on measures for different levels of anxiety

Dependent Variable	(I) Anxiety Level	(J) Anxiety Level	Mean Difference (I-J)	*SE*	*p*
Risks to belongings	normal	mild	1.040	.702	.139
		moderate	.968*	.484	.046
		severe	1.098*	.443	.013
	mild	normal	-1.040	.702	.139
		moderate	-.071	.767	.926
		severe	.058	.742	.937
	moderate	normal	-.968*	.484	.046
		mild	.071	.767	.926
		severe	.130	.540	.810
	severe	normal	-1.098*	.443	.013
		mild	-.058	.742	.937
		moderate	-.130	.540	.810
Unknown risks	normal	mild	.490	.703	.486
		moderate	1.415*	.484	.004
		severe	1.766*	.443	.000
	mild	normal	-.490	.703	.486
		moderate	.925	.768	.229
		severe	1.277	.742	.086
	moderate	normal	-1.415*	.484	.004
		mild	-.925	.768	.229
		severe	.351	.540	.516
	severe	normal	-1.766*	.443	.000
		mild	-1.277	.742	.086
		moderate	-.351	.540	.516
Health risks	normal	mild	.774	.749	.302
		moderate	1.714*	.516	.001
		severe	1.823*	.472	.000
	mild	normal	-.774	.749	.302
		moderate	.940	.818	.251
		severe	1.049	.791	.185
	moderate	normal	-1.714*	.516	.001
		mild	-.940	.818	.251
		severe	.109	.576	.849
	severe	normal	-1.823*	.472	.000
		mild	-1.049	.791	.185
		moderate	-.109	.576	.849

Dependent Variable	(I) Anxiety Level	(J) Anxiety Level	Mean Difference (I-J)	*SE*	*p*
Risks involving personal danger	normal	mild	-.029	.729	.968
		moderate	1.151*	.503	.022
		severe	1.366*	.460	.003
	mild	normal	.029	.729	.968
		moderate	1.180	.797	.139
		severe	1.395	.771	.071
	moderate	normal	-1.151*	.503	.022
		mild	-1.180	.797	.139
		severe	.215	.561	.702
	severe	normal	-1.366*	.460	.003
		mild	-1.395	.771	.071
		moderate	-.215	.561	.702
Risks to others	normal	mild	.738	.603	.222
		moderate	1.362*	.416	.001
		severe	1.397*	.380	.000
	mild	normal	-.738	.603	.222
		moderate	.624	.659	.345
		severe	.659	.637	.302
	moderate	normal	-1.362*	.416	.001
		mild	-.624	.659	.345
		severe	.035	.464	.939
	severe	normal	-1.397*	.380	.000
		mild	-.659	.637	.302
		moderate	-.035	.464	.939
Social risks	normal	mild	.358	.618	.562
		moderate	.818	.426	.055
		severe	1.153*	.389	.003
	mild	normal	-.358	.618	.562
		moderate	.460	.675	.495
		severe	.794	.653	.224
	moderate	normal	-.818	.426	.055
		mild	-.460	.675	.495
		severe	.334	.475	.482
	severe	normal	-1.153*	.389	.003
		mild	-.794	.653	.224
		moderate	-.334	.475	.482

Dependent Variable	(I) Anxiety Level	(J) Anxiety Level	Mean Difference (I-J)	*SE*	*p*
Everyday	normal	mild	3.370	3.207	.294
risks		moderate	7.428*	2.209	.001
		severe	8.603*	2.021	.000
	mild	normal	-3.370	3.207	.294
		moderate	4.058	3.504	.247
		severe	5.232	3.388	.123
	moderate	normal	-7.428*	2.209	.001
		mild	-4.058	3.504	.247
		severe	1.175	2.465	.634
	severe	normal	-8.603*	2.021	.000
		mild	-5.232	3.388	.123
		moderate	-1.175	2.465	.634
DAS-A-17	normal	mild	7.776*	2.875	.007
		moderate	11.633*	1.981	.000
		severe	19.661*	1.812	.000
	mild	normal	-7.776*	2.875	.007
		moderate	3.857	3.142	.220
		severe	11.885*	3.038	.000
	moderate	normal	-11.633*	1.981	.000
		mild	-3.857	3.142	.220
		severe	8.028*	2.211	.000
	severe	normal	-19.661*	1.812	.000
		mild	-11.885*	3.038	.000
		moderate	-8.028*	2.211	.000
PSWQ	normal	mild	-10.668*	2.009	.000
		moderate	-12.257*	1.384	.000
		severe	-18.430*	1.266	.000
	mild	normal	10.668*	2.009	.000
		moderate	-1.590	2.196	.469
		severe	-7.762*	2.123	.000
	moderate	normal	12.257*	1.384	.000
		mild	1.590	2.196	.469
		severe	-6.172*	1.545	.000
	severe	normal	18.430*	1.266	.000
		mild	7.762*	2.123	.000
		moderate	6.172*	1.545	.000

Dependent Variable	(I) Anxiety Level	(J) Anxiety Level	Mean Difference (I-J)	*SE*	*p*
IUS	normal	mild	-3.701*	1.400	.008
		moderate	-7.397*	.965	.000
		severe	-11.928*	.883	.000
	mild	normal	3.701*	1.400	.008
		moderate	-3.696*	1.530	.016
		severe	-8.227*	1.480	.000
	moderate	normal	7.397*	.965	.000
		mild	3.696*	1.530	.016
		severe	-4.531*	1.077	.000
	severe	normal	11.928*	.883	.000
		mild	8.227*	1.480	.000
		moderate	4.531*	1.077	.000
AnTI Social worry	normal	mild	-4.064*	.889	.000
		moderate	-5.530*	.612	.000
		severe	-8.288*	.560	.000
	mild	normal	4.064*	.889	.000
		moderate	-1.466	.971	.132
		severe	-4.224*	.939	.000
	moderate	normal	5.530*	.612	.000
		mild	1.466	.971	.132
		severe	-2.758*	.683	.000
	severe	normal	8.288*	.560	.000
		mild	4.224*	.939	.000
		moderate	2.758*	.683	.000
AnTI Metaworry	normal	mild	-1.690*	.645	.009
		moderate	-2.451*	.444	.000
		severe	-4.742*	.406	.000
	mild	normal	1.690*	.645	.009
		moderate	-.762	.704	.280
		severe	-3.052*	.681	.000
	moderate	normal	2.451*	.444	.000
		mild	.762	.704	.280
		severe	-2.290*	.496	.000
	severe	normal	4.742*	.406	.000
		mild	3.052*	.681	.000
		moderate	2.290*	.496	.000

Dependent Variable	(I) Anxiety Level	(J) Anxiety Level	Mean Difference (I-J)	*SE*	*p*
AnTI Health	normal	mild	-2.879*	.730	.000
worry		moderate	-4.854*	.503	.000
		severe	-8.322*	.460	.000
	mild	normal	2.879*	.730	.000
		moderate	-1.975*	.797	.013
		severe	-5.443*	.771	.000
	moderate	normal	4.854*	.503	.000
		mild	1.975*	.797	.013
		severe	-3.468*	.561	.000
	severe	normal	8.322*	.460	.000
		mild	5.443*	.771	.000
		moderate	3.468*	.561	.000
AnTI	normal	mild	-8.632*	1.816	.000
		moderate	-12.835*	1.251	.000
		severe	-21.351*	1.144	.000
	mild	normal	8.632*	1.816	.000
		moderate	-4.203*	1.984	.035
		severe	-12.719*	1.918	.000
	moderate	normal	12.835*	1.251	.000
		mild	4.203*	1.984	.035
		severe	-8.516*	1.396	.000
	severe	normal	21.351*	1.144	.000
		mild	12.719*	1.918	.000
		moderate	8.516*	1.396	.000

Appendix M: Correlations between ERI-E scales and cognitive measures for different levels of anxiety.

Anxiety=normal, *n*=300

	DAS-A-17	PSWQ	IUS	AnTI Social worry	AnTI Metaworry	AnTI Health worry	AnTI
Risks to belongings	.022	-.139	-.162	-.043	-.059	-.087	-.075
Unknown risks	.085	-.219	-.268	-.148	-.031	-.175	-.153
Health risks	-.029	-.268	-.186	-.035	.006	-.197	-.091
Risks involving personal danger	-.046	-.154	-.196	-.012	.021	-.181	-.069
Risks to others	-.091	-.162	-.120	.012	.034	-.188	-.055
Social risks	.171	-.204	-.251	-.154	-.103	-.117	-.157
Everyday risks	.022	-.242	-.249	-.079	-.026	-.199	-.125

Anxiety=mild, *n*=49

	DAS-A-17	PSWQ	IUS	AnTI Social worry	AnTI Metaworry	AnTI Health worry	AnTI
Risks to belongings	.122	-.213	-.313	-.042	-.218	-.079	-.126
Unknown risks	.386	-.318	-.396	-.138	.079	-.075	-.065
Health risks	.182	-.287	-.324	-.066	-.065	-.154	-.106
Risks involving personal danger	.086	-.232	-.308	.068	-.171	-.078	-.053
Risks to others	-.053	-.089	-.050	.092	.078	-.153	.027
Social risks	.416	-.565	-.510	-.248	-.205	-.315	-.301
Everyday risks	.250	-.377	-.429	-.068	-.114	-.185	-.135

Anxiety=moderate, *n*=126

	DAS-A-17	PSWQ	IUS	AnTI Social worry	AnTI Metaworry	AnTI Health worry	AnTI
Risks to belongings	-.053	.103	-.040	.075	.006	.075	.071
Unknown risks	.050	-.002	-.187	.003	-.016	.057	.020
Health risks	-.042	.070	-.005	.147	.117	.161	.180
Risks involving personal danger	-.119	.088	-.091	.165	.057	.136	.157
Risks to others	-.055	-.131	-.101	.095	.207	.000	.119
Social risks	.078	-.205	-.241	-.023	.134	-.164	-.034
Everyday risks	-.037	.000	-.143	.110	.105	.073	.121

Anxiety=severe, *n*=164

	DAS-A-17	PSWQ	IUS	AnTI Social worry	AnTI Metaworry	AnTI Health worry	AnTI
Risks to belongings	-.081	-.004	-.079	.065	.005	.002	.033
Unknown risks	.101	-.248	-.334	-.015	-.009	-.181	-.087
Health risks	-.071	-.087	-.178	.086	-.021	-.044	.013
Risks involving personal danger	-.075	-.051	-.163	.099	.036	-.033	.046
Risks to others	-.053	-.239	-.131	.013	.059	-.131	-.027
Social risks	.131	-.149	-.176	-.116	.095	-.050	-.038
Everyday risks	-.014	-.157	-.223	.033	.031	-.089	-.010

Low Anxiety (levels 1 and 2), *n*=349

	DAS-A-17	PSWQ	IUS	AntTI Social worry	AnTI Metaworry	AnTI Health worry	AnTI
Risks to belongings	.052	-.165	-.197	-.062	-.101	-.103	-.103
Unknown risks	.135	-.233	-.288	-.150	-.018	-.166	-.143
Health risks	.013	-.275	-.213	-.052	-.015	-.198	-.104
Risks involving personal danger	-.025	-.158	-.211	.002	-.014	-.161	-.063
Risks to others	-.073	-.163	-.117	.009	.031	-.193	-.056
Social risks	.207	-.246	-.286	-.169	-.121	-.145	-.179
Everyday risks	.064	-.264	-.278	-.088	-.048	-.205	-.136

High Anxiety (levels 3 and 4), *n*=290

	DAS-A-17	PSWQ	IUS	AntTI Social worry	AnTI Metaworry	AnTI Health worry	AnTI
Risks to belongings	-.065	.042	-.064	.065	.002	.030	.043
Unknown risks	.087	-.143	-.279	-.016	-.021	-.090	-.053
Health risks	-.056	-.020	-.112	.105	.029	.035	.073
Risks involving personal danger	-.087	.006	-.136	.119	.038	.031	.081
Risks to others	-.052	-.184	-.117	.045	.113	-.074	.030
Social risks	.115	-.176	-.205	-.085	.097	-.104	-.048
Everyday risks	-.017	-.092	-.194	.056	.051	-.031	.031