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**Understanding the Role of Humour in the Relationship
between Emotional Intelligence and Psychological Well-
being among University Students: A mixed methods study**

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BSc, MSc

**Submitted in Fulfilment of The Requirements for The Degree of
Doctor of Philosophy (PhD) In Psychological Medicine**

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Abstract

Psychological well-being is feeling good and functioning effectively, and absence of distress. Emotional intelligence (EI) involves competencies in perceiving, understanding, processing, and managing emotions. Although many studies demonstrate the relationship between EI and psychological well-being, underlying mechanisms are unclear. Humour is a potential mediator in the relationship. This systematic review and mixed methods study, explored the role of humour in the relationship between EI and psychological well-being among university students. The systematic review examined existing evidence about the relationship between EI and humour styles. Results based on 10 studies indicated that EI was regularly and positively associated with adaptive humour styles and negatively associated in some studies with maladaptive humour. Trait EI (i.e., viewing EI as a personality trait) showed broader associations with humour styles than ability EI (i.e., viewing EI as a cognitive ability). Self-enhancing humour (i.e., a humorous perspective and a coping strategy towards adversity) showed the most consistent relationship with both ability and trait EI. Trait EI assessed by the Trait Emotional Intelligence Questionnaire showed broad, and small to medium correlations with humour styles, and was used for the quantitative study which examined the mediating role of humour styles between trait EI and well-being, and distress. Partial least squares structural equation modelling (N = 536) found self-enhancing humour mediated the relationship between trait EI and positive affect; self-defeating humour (i.e., amusing others at the expense of self) mediated the relationship between trait EI and negative affect, anxiety, and depression, separately; and affiliative humour (i.e., amusing others to improve relationships and reduce tensions) mediated the relationship between trait EI and anxiety. Qualitative semi-structured interviews (N = 16) explored the role of humour in self-managing psychological well-being among UK/EU and international students with diverse EI levels. Themes were: *meaning of psychological well-being; functions of humour; and; self-managing psychological well-being*. Humour was more likely to function unconsciously in real life. Humour styles are one of the mechanisms underlying the association between EI and psychological well-being, supporting the hypothesis in the Affective Mediation Model and suggesting potential interventions.

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Author's Declaration

I, Rong Xing, declare that I am the sole author of this thesis. I was responsible for leading this research, including planning, designing, analysing, and writing, under guidance from my supervisors. I confirm that where information has been derived from other sources has been indicated in the thesis.

Publications and Presentations

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Abbreviations

AEI	Ability emotional intelligence
AEW	Andrea E. Williamson
AF	Affiliative humour style
AG	Aggressive humour style
AMM	Affective Mediation Model
AVE	Average variance extract
AXIS	Appraisal tool for Cross-Sectional Studies
CI	Confidence interval
CR	Composite reliability
CSM	Comic Style Markers
CW	Christopher Williams
DET	Differential Emotions Theory
EI	Emotional intelligence
EIS	Emotional Intelligence Scale
EU	European Union
GAD	Generalized anxiety disorder
GDPR	General Data Protection Regulation
GPPC	General Practice and Primary Care
HBQD	Humorous Behaviour Q-sort Deck
HS	Humour style
HSQ	Humour styles questionnaire
HTMT	Fornell-Larcker Criterion and Heterotrait-Monotrait Ratio
JM	Jillian Morrison
LS	Life satisfaction
MD	Mental distress
MEIS	Multi-Factor Emotional Intelligence Scale
MSCEIT	Mayer-Salovey-Caruso Emotional Intelligence Test

MVLS	College of Medical, Veterinary & Life Sciences
MW	Mental well-being
NA	Negative affect
PA	Positive affect
PANAS	Positive and Negative Affect Schedule
PHQ	Patient Health Questionnaire
PLS-SEM	Partial Least Squares Structural Equation Modelling
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-analysis
PROSPERO	International Prospective Register of Ongoing Systematic Reviews
PWB	Psychological well-being
QUAL	Qualitative study
QUAN	Quantitative study
RX	Rong Xing
SD	Self-defeating humour style
SE	Self-enhancing humour style
SEM	Structural equation modelling
SPWB	Psychological Well-Being Scales
SRMR	Standardized root mean square residual
SWB	Subjective well-being
SWLS	Satisfaction with Life Scale
TEI	Trait emotional intelligence
TEIQue	Trait emotional intelligence questionnaire
TEIQue-SF	Trait emotional intelligence questionnaire-short form
UK	United Kingdom
VIF	Variance inflation factor
WHO	World Health Organisation

Chapter 1 Introduction to the thesis

1.1 Research rationale and introduction

Psychological well-being relates to more than the absence of disease or disorder; it also relates to the presence of feeling good and functioning effectively (Huppert 2009). This is becoming an increasingly significant research topic in positive psychology and in public health (Herrman *et al.*, 2005; Mehta, Croudace and Davies, 2015; WHO, 2022). The focus throughout this thesis is on psychological well-being, and contributing factors, among university students. Well-being and distress are correlated but distinct constructs, rather than simply opposite ends of a single continuum (Massé *et al.*, 1998; Keyes, 2005; Hides *et al.*, 2020). Therefore, both well-being and distress were studied separately in this thesis, in order to gain a nuanced and comprehensive understanding of psychological well-being.

University students were purposively chosen as the focus of this research study. Most university students, because of their age, are in a developmental stage called emerging adulthood (Arnett, 2000, 2007; Arnett, Žukauskienė and Sugimura, 2014). Emerging adults including university students face diverse challenges including identity exploration, psychosocial adjustment, academic stress, increased independence, and life instability (Arnett, Žukauskienė and Sugimura, 2014).

These challenges require students to have good emotion knowledge and skills to respond to their circumstances effectively. Thus, university students are more likely to have worse well-being and more distress than other age groups. However, little is known about psychological well-being in this life stage specifically, due to the newness of this research area (Tanner, 2014).

Among many positive psychological constructs, emotional intelligence (EI) has increasingly become a hot topic of much theory and research, especially due to its potential relationship with psychological well-being (Zeidner, Matthews and Roberts, 2012). Well-established associations between EI and psychological well-being have been documented (Schutte *et al.*, 2007; Martins, Ramalho and Morin, 2010). However, empirical studies revealed little about the mechanisms underlying the EI - psychological well-being relationship. The Affective Mediation Model proposes that both intra- and inter-personal mechanisms can be helpful in explaining the association between EI and psychological well-being (Zeidner, Matthews and Roberts, 2012). In this study humour styles, containing adaptive and maladaptive functions and intra- and inter-personal processes, were also hypothesised as mediators that may explain the mechanisms underlying this relationship. Hence, the main aim of the thesis was to explore the role of humour in the relationship between EI and psychological well-being among university students.

Connections between EI and humour styles have been separately established with

psychological well-being. This has also been described in meta-analytic studies (e.g., Martins, Ramalho, and Morin, 2010; Schneider, Voracek, and Tran, 2018). Both constructs are crucial in the field of positive psychology. These analyses suggest potential associations between EI and humour styles. However, there is no study that systemically investigates the existing evidence of this link. The connections between EI and humour styles remain unclear. Therefore, a systematic review of the relationship between EI and humour styles was conducted as the first stage of the thesis. Correlations of overall EI and EI components with each humour style were examined, to highlight the current knowledge and provide a comprehensive understanding regarding each construct and their relationship, and to identify potential gaps in the literature.

Three previous quantitative studies have examined the mediating role of humour styles between EI and indices of psychological well-being (Greven *et al.*, 2008; Wang *et al.*, 2019; Huang and Lee, 2019), however, findings are mixed, and some of them are inconsistent with the theoretical assumption. For example, affiliative humour does not play a role between trait EI and subjective well-being. Limitations were identified including lack of information about the population studied, and a lack of focus on eudaimonic well-being or distress. Moreover, the contextual and unconscious characteristics of humour styles are neglected.

For the second stage of the thesis, a mixed methods study consisting of a quantitative study and a qualitative study were conducted to explore the role of

humour styles in the relationship between EI and psychological well-being among university students. The quantitative study tested the mediation relationship and improved on some of the limitations identified in previous studies, by studying well-being and distress separately, and deliberately focusing on the population of university students. And a sequential qualitative study gained insight into the role of humour in psychological well-being among home and international students with diverse EI levels in a university context, and identified unconscious humour behaviours. Hence, the mixed methods design is more likely to gain a “full picture” of the current mediation relationship.

Exploring the mediating role of humour styles in the relationship between EI and psychological well-being is important both theoretically and practically. From a theoretical perspective, testing the mediation relationship can advance the understanding of the mechanisms through which EI correlates with psychological well-being via humour styles. Previously the mechanisms were unclear, especially when psychological well-being is studied as well-being and distress separately. The role of humour styles may differ in the EI - well-being link and in the EI - distress link. For example, a certain humour style may mediate the link between EI and well-being, but may not necessarily mediate the link between EI and distress. Findings can advance the understanding of a single construct as well as their interplay, which is less likely to be gained from testing direct links between EI/humour styles and psychological well-being. In addition, the results may identify possible drivers underlying this mediation relationship. For example, how

this relationship functions through affective components such as affective empathy and is thus related to affective well-being. Furthermore, these specific and comprehensive findings may improve existing theoretical models, such as the Affective Mediation Model, and contribute to the development of new models.

From a practical perspective, targeted interventions or training aiming to improve EI may include the use of humour as a method for addressing the specific needs of a particular population. Such programmes incorporating humour may be more effective than directly improving EI. Due to the possible different mediating relationships regarding well-being and distress, specific interventions could be designed particularly to enhance well-being or to reduce distress. And humour-centred interventions or training could be designed to foster the appropriate use of humour in different contexts thus improving EI and psychological well-being. These interventions could also be designed to address the particular needs of people with different humour styles. Additionally, the research was conducted with university students; thus tailored interventions could be developed to target this population in the university context.

1.2 Aims and research questions

This thesis aimed to understand the mechanisms involved in achieving desirable psychological well-being for university students with different EI levels and humour behaviours. To achieve this, I sought to answer the following research

questions (RQs):

Stage 1 systematic review

RQ1-1: what has been found in previous studies about the relationship between ability/trait EI and humour styles among adults in non-clinical settings?

RQ1-2: how do previous studies explain the relationship between ability/trait EI and humour styles among adults in non-clinical settings?

Stage 2 mixed methods study

RQ2: what is the role of humour styles in the relationship between trait EI and psychological well-being among university students and what are their perceptions regarding the role of humour in psychological well-being?

More specifically, for the quantitative study:

RQ2-1: what is the association between trait EI, humour styles, and psychological well-being?

RQ2-2: how do humour styles mediate the relationship between trait EI and psychological well-being?

For the qualitative study:

RQ2-3: what is the role of humour in psychological well-being among university students?

1.3 Personal motivation

My past studies and work experiences motivated me to pay close attention to the emotions and psychological well-being of university students, especially international students. I majored in psychology as an undergraduate student and the focus of my dissertation was on the creative thinking and the emotions in academic settings of university students, which made me very interested in the study of emotions. My master's degree dissertation focused specifically on the psychological well-being of adolescents, which gave me a greater understanding of emotions and well-being.

After graduation, I worked for a university in the daily management and psychological support of students. In China, it is the first time that most undergraduates leave their parents' home to live and study in a new environment, which can be a challenge to their psychological well-being. Although students are of the same age and education level, I observed that they have different abilities to adapt to the environment and manage their emotions, which also has a differential impact on their well-being. During the four-years I worked in student

support services, I had contact with many students in need of psychological support. Their distress varied but generally exposed a demand for emotional management. University students are in a transition period from being students to being members of society, and their psychological well-being requires significant attention and support.

As a previous international student in the United Kingdom (UK), I was well aware that international students may encounter additional challenges due to the demands of adapting to the foreign educational, social, economic and interpersonal environment this brings. The UK is the second most popular choice in the world for international students to study. It is estimated that 15% of the student population in the UK are international students (King *et al.*, 2010). Several studies suggested that international students are more likely to have mental health problems due to adjustment difficulties (e.g., Eskinadrieh *et al.*, 2012). Therefore, I was particularly keen to investigate how we understand psychological well-being, and how we might improve it based on the understanding of EI and humour, among university students, both home and international.

1.4 Overview of the thesis

This thesis consists of nine chapters. The following is a brief overview of the content covered in each subsequent one.

Chapter 2 provides the background to our understanding about psychological well-being from a positive psychology perspective and explains why psychological distress is also a focus. University students, as the population of interest, are discussed in the literature on emerging adulthood.

Chapter 3 describes EI and humour styles, and their associations with psychological well-being. The potential relationship between these two constructs is discussed.

Chapter 4 describes the methodological considerations in this research including the philosophical stance and theoretical assumptions of psychology and social sciences. It also justifies the decisions made to use specific research methods to address each research question.

Chapter 5 sets out Stage 1 of the research; the systematic review of the literature on the relationship between EI and humour styles, its findings, discussions, and conclusions.

Chapter 6 sets out the first portion of the mixed methods study which is Stage 2. The quantitative component uses PLS-SEM to investigate the mediation effect of humour styles in the relationship between trait EI and psychological well-being among university students.

Chapter 7 reports the qualitative component of Stage 2. The qualitative study uses

semi-structured interviews to provide further insights into the role of humour in psychological well-being among home and international university students.

Chapter 8 synthesises the findings from chapters 5, 6 and 7, compares them to the wider literature, discusses the strengths and limitations of the thesis and makes recommendations.

Chapter 2 Understanding psychological well-being in university students

2.1 Overview

This chapter will introduce an overview of the understanding of psychological well-being used in the current thesis. My understanding of psychological well-being comes from a positive psychology perspective. Two well-being approaches (hedonic well-being and eudaimonic well-being), two prevalent disorders (depression and anxiety), and the relationship between psychological well-being and psychological distress will be presented and discussed. Psychological well-being embracing both hedonic and eudaimonic well-being, and distress involving both depression and anxiety, will be investigated, and be assessed separately in university students in relation to the literature on emerging adulthood.

2.2 Understanding psychological well-being

“Psychology is not just the study of weakness and damage, it is also the study of strength and virtue”(Seligman, 1998, p. 1). Psychological well-being relates not only to the absence of distress, but also to the presence of feeling good and functioning effectively (Huppert, 2009). Studies investigating the relationship between psychological well-being and psychological distress suggested that well-being and distress are correlated but distinct constructs (Massé *et al.*, 1998; Keyes, 2005; Hides *et al.*, 2020). The drivers of well-being are also not the same as the

drivers of distress (Huppert, 2009). Therefore, in the current thesis, psychological well-being involving both well-being and distress will be considered, and studied separately. I use “psychological well-being” to describe the overall outcome regarding both well-being and distress, and to suggest a positive perspective in line with enhancement of individual overall psychological health.

2.2.1 Understanding psychological well-being from a positive psychology perspective

In the past few decades, a growing body of studies have focused on factors that encourage individuals to pursue adaptive life outcomes and optimal functioning, and to avoid negative outcomes at the same time, becoming a research field called positive psychology (Seligman and Csikszentmihalyi, 2000). Central to the research of positive psychology is enhancement of individual psychological well-being (Seligman, 2002). The field of positive psychology recognises that, such adaptive life outcomes and optimal functioning require development of two general approaches, namely, hedonic well-being and eudaimonic well-being (Waterman, 1984, 1993; Ryff, 1989; Ryan and Deci, 2001). In general, hedonic well-being deals with happiness, whereas eudaimonic well-being deals with human potential (Ryff, Boylan and Kirsch, 2021). Both approaches are fundamental to the current understanding of the nature of human well-being.

2.2.2 Hedonic well-being

In line with conceptions from the ancient Greeks, hedonic psychology was defined as the research of what constitutes enjoyable and unenjoyable experiences in life (Kahneman, Diener and Schwarz, 1999). Early researchers considered happiness and life satisfaction as the primary components of well-being (Gurin, Veroff and Feld, 1960; Cantril, 1965; Bradburn, 1969; Diener, Smith and Fujita, 1995). Bradburn (1969) suggested that a balance between positive and negative affect resulted in happiness, which became fundamental in later conceptions of hedonic well-being (Diener, Smith and Fujita, 1995). Therefore, the three components, life satisfaction, positive affect, and negative affect, consisted of the formulation of hedonia (Ryan and Deci, 2001).

Hedonic well-being is a broad area which involves individuals' emotional responses, satisfaction of a particular life area, and general evaluation of life satisfaction (Diener *et al.*, 1999). It includes affective components including positive and negative affect (Watson, Clark and Tellegen, 1988), and cognitive evaluations of life satisfaction (Diener *et al.*, 1985). Affect, including both moods and emotions, reflects an individual's evaluation of the current events in their life (Diener *et al.*, 1999). It is usually measured with frequency ratings (how often) in the past week, month, or year. Life satisfaction reflects a cognitive appraisal of an individual's own life experiences about the past and present (Diener, Lucas and Oishi, 2002). It is viewed as a long-term aspect of well-being.

2.2.3 Eudaimonic well-being

The eudaimonic approach originated based on many areas such as clinical, developmental, existential, and humanistic psychology, as well as Aristotle's works (Ryff, Boylan and Kirsch, 2021). There are three principal theories in the field of psychological eudaimonics: Waterman's Eudaimonic identity theory (Waterman, 1984, 1993), Deci and Ryan's Self-determination theory (Ryan and Deci, 2001), and Ryff's Psychological Well-being (Ryff, 1989). All three theories considered "the fulfilment of the ultimate purpose of being human" as the good life, and the ultimate purpose usually linked to an optimally functioning life (Vittersø, 2016, p. 9).

Eudaimonic well-being focusing on optimal functioning enables us to feel that what we are doing has meaning and purpose (Ryan and Deci, 2001). It involves the purpose of positive fulfilment for an individuals' growth (Fromm, 1981) and concepts such as autonomy, mastery, and life meaning (Morgan and Farsides, 2009). Ryff (1989) put forward a comprehensive eudaimonic model, named psychological well-being (PWB) in research, explicitly concerned with personal development, self-realisation, and the capability to cope with adversity (Ryff and Singer, 2008). The scale of PWB is the most widely used assessment of positive psychological functioning (Huppert, 2009), and this was used in the current study. This model consists of six key dimensions: (1) whether people viewed their life was in line with their personal belief (autonomy); (2) the extent to which people were managing their life circumstances (environmental mastery); (3) how well people were taking advantage of their potential and talents (personal growth); (4) the

depth of people's connection with significant others (positive relations with others); (5) the extent to which people viewed their life had direction, purpose, and meaning (purpose in life); (6) and the attitude and acknowledgement of themselves, including awareness of their good and bad qualities (self-acceptance). Although eudaimonic well-being often coexists with hedonic well-being, human fulfilment and self-realization were considered going beyond and being more sustaining than feeling good and experiencing highlife satisfaction (Ryff and Singer, 2008).

2.3 Psychological distress - depression and anxiety

My interest in psychological well-being builds on both psychological well-being and psychological distress. Psychological distress is defined as a nonspecific syndrome containing symptoms such as anxiety, depression, and cognitive problems (e.g., Prévile *et al.*, 1991, cited in Massé *et al.*, 1998; Lahey, 2009). I opted to focus on depression and anxiety in the current study because they are the most prevalent mental disorders worldwide (WHO, 2022). Levels of depression and anxiety were directly measured in the present study.

Depression and anxiety commonly coexist. According to the Global Health Data Exchange in 2019, approximately 13% of the global population is living with a mental disorder, with 28.9% of those suffering depressive disorders and 31% suffering anxiety disorders (GBD Results Tool, 2019). On average, depression will

appear for the first time during the period from mid to late teens, and women generally experience more depression than men (WHO, 2022). According to The Diagnostic and Statistical Manual of Mental Disorders (DSM-5), “depression (major depressive disorder) is a common and serious medical illness that negatively affects how you feel, the way you think and how you act.” Individuals with depression tend to lose their interest in some once enjoyed activities and have a feeling of sadness. It may result in a series of physical and emotional problems and have a negative impact on individuals’ ability to deal with issues from work and home. Anxiety is a common response to pressure and tends to be helpful in some situations. It is an alarm that helps us prepare and pay attention to dangers and some other negative situations. However, as the American Psychiatric Association describes, anxiety disorders refer to extreme fear or anxiety, which is different from the usual feelings of anxiousness and harm for individuals’ life (Psychiatry.org - Anxiety Disorders, 2020).

2.4 The relationship between well-being and distress

Psychological well-being was traditionally assumed to be the opposite end of the continuum to psychological distress, such that the presence of well-being would equal the absence of distress. However, empirical studies indicated that well-being and distress are two correlated but globally independent constructs (e.g., Massé *et al.*, 1998; Keyes, 2005; Hides *et al.*, 2020). For example, Keyes (2005) developed a two-continua model for overall psychological health. This model

hypothesized that well-being and distress were two distinct but interrelated dimensions of overall psychological health. Results of studies among adults, young people, and adolescents supported this hypothesis that well-being and distress were correlated but had components functioning independently (Keyes, 2007; Keyes *et al.*, 2012; Hides *et al.*, 2020). In addition, several empirical studies suggest that some drivers of distress are different from the drivers of well-being (Huppert, 2009). For example, personality is considered as one of the strongest predictors, that is, extraversion appears to drive positive emotions, whereas neuroticism contributes to negative emotions and common psychological disorders (e.g., Neeleman, Ormel and Bijl, 2001; Kendler *et al.*, 2006). Gender also has different relations with psychological status, such as, females have significantly higher risk of suffering from depression and anxiety than males, but the gender differences are not clear for well-being (Huppert, 2009). These relations and distinctions between well-being and distress may imply that the mechanisms underlying the relationship between psychological constructs and well-being are different from the relationship with distress. Therefore, in the current thesis, both psychological well-being and psychological distress will be investigated, and be assessed separately.

2.5 Psychological well-being in university students

Arnett and colleagues (Arnett, 2000, 2007; Arnett, Žukauskienė and Sugimura, 2014) identified a new phase of development, emerging adulthood, between the

end of adolescence and the start of a stable adulthood, lasting from 18 years old to about 29 years old. University students are predominantly composed of emerging adults, which was the focus of the thesis.

Five features were proposed that make the period of emerging adulthood different from adolescence and adulthood (Arnett, Žukauskienė and Sugimura, 2014). Emerging adults usually feel that they are in-between adolescence and adulthood; they are exploring diverse possibilities of what kind of person they want to be and what kind of life they want to live. They are more likely to focus on themselves because they have fewer obligations to others than in other life stages. This period seems to be the most unstable stage in the whole lifespan due to changes in education, living, work, and romantic relationships. Although emerging adults often struggle with uncertainty and mixed emotions, most of them are optimistic about their future (Arnett, Žukauskienė and Sugimura, 2014). These features suggest a significant need to pay attention to psychological well-being in emerging adults. However, very little is known about psychological well-being in emerging adults specifically, because emerging adulthood was conceptualised as a distinct life stage and empirically studied only since 2000 (Tanner, 2014). And most mental health research is historically conducted on adults, children, and adolescents (Tanner, 2014).

Tanner (2014) proposed a model of psychological well-being for emerging adults, which resonates with the perspective of positive psychology and psychological

well-being. Tanner's model has the goals of optimal functioning, being personally mature, having appropriate life purposes and expectations, feeling good and being less distressed. This model involves not only high levels of well-being (both hedonic and eudaimonic approaches), but also low levels of distress, suggesting a comprehensive perspective on psychological well-being in emerging adulthood. Recent research on well-being in emerging adulthood found that around 21% of emerging adults in US colleges had optimal human functioning, positive emotions, and no mental illness (Howell, 2009). Research on a large European sample found that emerging adults tended to have less optimal functioning and more negative emotions, compared to adults in their 30s and 40s (Huppert and So, 2013). These findings might imply that emerging adulthood was more about developing these favourable characteristics or qualities, and less about already having them (Tanner, 2014). Research also found that feeling anxious or depressed is prevalent during emerging adulthood. A review of epidemiological studies in the US indicated that the percentage of any mental disorder, especially for anxiety disorders and mood disorders, for 12 months was higher than 40% among emerging adults, which was higher than any other age groups (Kessler *et al.*, 2005). And major depressive disorders were the most prevalence mood disorders according to this review (Kessler *et al.*, 2005). A national epidemiological survey in Japan found similar results that people between 20 and 34 years were most likely to suffer anxiety disorders and mood disorders, and the incidence of these mental disorders in the past 12 months was higher than in age 35 or older age groups (Kessler and Wang, 2008). These high levels of distress might be associated with uncertainty,

instability, and self-focus in emerging adulthood. These features also tended to lead to inadequate social support (Arnett, Žukauskienė and Sugimura, 2014). Results of a longitudinal study found a negative association between depression and social support in people between 21 and 30 years of age, that is, feelings of depression were highest in their early 20s and gradually decreased, whereas perceived social support was lowest in their early 20s and gradually increased (Pettit *et al.*, 2011). In addition, emerging adulthood is deemed as a period of plasticity, which is shaped and lastingly impacted by life events during this period (Elnick *et al.*, 1999; Andersen, 2003; Demiray, Gülgöz and Bluck, 2009). Development in emerging adulthood potentially has a long-lasting impact on adulthood. Emerging adults are more likely to have less well-being and more distress than other age groups, which highlights the need to study psychological well-being in this life stage.

Context and culture impact individual development at different periods, including emerging adulthood, from different aspects (Tanner, Arnett and Leis, 2009). University is one of the most important environments for emerging adulthood, especially during the trend of globalising education in high-income countries, with some universities provide a multicultural context for emerging adults. An increasing number of 18-year-olds have entered a university in the past decade. According to the Higher Education Statistics Agency (UK higher education, 2023), UK 18-year-old undergraduate enrolments rose from 24.7% in 2006 to a peak of 38.2% in 2021. Being a university student is an opportunity and a challenge for

emerging adults. University students are expected to be much more independent in both study and living. They need to do more self-directed learning, develop critical thinking, and obtain in-depth knowledge of a particular subject area. Some of them experience their first independent living in the university. They also have more chances to enrich their social network by joining extracurricular activities and societies provided by the university. All these features of universities are different from studying and living in secondary schools, which inevitably influence their psychological well-being. It is reported that approximately one-third of university students suffer from ongoing psychiatric problems worldwide (Ibrahim *et al.*, 2013; Auerbach *et al.*, 2018). In the UK, around one-fifth of university students experience mental health problems (Thorley, 2017). It is well-documented that university students represent a high-risk group for the experience of psychological distress (Ibrahim *et al.*, 2013; Jenkins *et al.*, 2021). Systematic and meta-analytic studies suggest that the weighted mean of the prevalence of depression or depressive symptoms is 30.6 % among university students (Prinz *et al.*, 2012; Ibrahim *et al.*, 2013). Regarding anxiety, the prevalence amongst university students ranges between 7.7% and 65.5% (Hope and Henderson, 2014). Empirical studies reported the prevalence of anxiety was 42.1% in university students in the UK (Martín-Merino *et al.*, 2009; Jenkins *et al.*, 2021). A sharp increase in demands for professional psychological support has been reported in the population of university students (Brown, 2016). Therefore, understanding students' psychological well-being in a university context became the interest of the current study.

In addition, with the trend of globalising education and research, an increasing number of international students enrol at UK universities. According to the Higher Education Statistics Agency (UK higher education, 2023), 679,970 international students were studying in the UK in the academic year 2021/2022, an increase of 12.3% in the number of international students compared to the previous academic year. Studying abroad may lead to a sense of confusion, and consequent feelings of uncertainty and anxiety for some students. International students need to manage emotions and behaviours, learn new social skills, and acquire effective strategies to cope with potential emotional, social, academic, and cultural stressors in a new context, both within and outside the university (Zhou *et al.*, 2008; Forbes-Mewett and Sawyer, 2016). Hence, international students may face additional pressures at the transition than home students. For example, research reported difficulties, such as anxiety, depression, uncertainty, confusion, homesickness, loneliness, and sleeping problems, among international students (Brown and Holloway, 2008). Enrolment of international students, on the other hand, provides a diverse cultural context in universities, which may be a challenge for home students to learn diverse cultures and develop new social skills, consequently impacting their psychological well-being.

In summary, understanding the psychological well-being of university students, especially international students, is of great significance to higher education providers and mental health research and practice.

2.6 Chapter summary

This chapter provided an overview of the understanding of psychological well-being in the current thesis. The interest in psychological well-being builds on both well-being and distress. They are correlated but distinct constructs, such that both psychological well-being and distress would be investigated, and be assessed separately. The current chapter also provided an understanding of psychological well-being during emerging adulthood, and highlighted the significance of studying a university sample.

Chapter 3 Emotional intelligence and psychological well-being: the role of humour styles

3.1 Overview

This chapter provides an overview of the understanding and measurements of EI and humour styles, and their relationship to psychological well-being. Emotion-related theories that potentially contribute to demonstrating the association between EI and humour styles are discussed. The chapter also reviews previous research regarding the mediating role of humour styles between EI and psychological well-being. Finally, this chapter hypothesises the mediation relationship based on the Affective Mediation Model.

3.2 Introduction to emotional intelligence

Of many positive psychological constructs, emotional intelligence (EI) has increasingly become a focal point of much theory and research, especially due to the potential relationship between EI and psychological well-being (Zeidner, Matthews and Roberts, 2012). In general, a set of competencies in perceiving, understanding, processing and managing our own and others' emotions is known as emotional intelligence (Matthews, Zeidner and Roberts, 2008). EI was initially introduced by Salovey and Mayer (1990). Over the past 30 years, the field of EI

has been comprehensively studied and expanded, leading to two approaches to its theoretical model and measurement model, namely, ability EI (Mayer and Salovey, 1997) and trait EI (e.g., Bar-on, Jamon and Barshavit, 1997; Petrides and Furnham, 2001).

3.2.1 Ability EI and measures

Ability EI focuses on “the ability to carry out accurate reasoning about emotions and the ability to use emotions and emotional knowledge to enhance thought” (Mayer, Roberts and Barsade, 2008, p. 507). It consists of four branches including perceiving emotions, using emotions to facilitate thought, understanding emotions, and managing one’s emotions and the emotions of others (Mayer, Salovey and Caruso, 2002). Two maximal performance assessments, the Multi-Factor Emotional Intelligence Scale (MEIS; Mayer, Caruso and Salovey, 1999) and the subsequent Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer, Salovey and Caruso, 2002), were developed particularly to measure the four branches of the ability EI model.

Ability EI is considered to be a component of the intelligence domain (Mayer, Roberts and Barsade, 2008). Factor-analytic studies examined the associations between ability EI and other types of intelligence (e.g., fluid intelligence or crystallised intelligence). EI was found to be a distinct factor within the intelligence model, be a group component of cognitive ability, and represent

intelligence in the emotion domain (MacCann, 2010; MacCann *et al.*, 2014). Individual studies have also demonstrated the incremental validity of ability EI over intelligence and personality in criteria relating to positive relationships and adolescent mental health (Davis and Humphrey, 2012; Lanciano and Curci, 2014).

However, criticism of ability EI is mainly around whether ability EI can be considered a component of intelligence. Intelligence measures usually have a correct answer to each item, by contrast, ability EI measures are related to subjective emotional experiences thus difficult to identify “correct” answers to items involving emotional problems (Petrides, Pérez-González and Furnham, 2007). Also, ability EI measures usually assess more emotion knowledge than emotional performance, for example, the best solution to coping with anger from others directed at you may not be translated into using that behaviour in the real-life situation (Brody, 2004). The performance on a laboratory emotion test may be more realistic than questionnaire responses. In addition, a meta-analysis found low to moderate correlations between ability EI and personality, suggesting ability EI might contain some personality traits (Roberts, Schulze and MacCann, 2008).

The MSCEIT is the most widely used ability EI measure (Austin, 2018). However, a meta-analytic study on the factor structure of the MSCEIT reported that the correlation between “perceiving emotions” branch and “facilitating emotions” branch of the model was .90 (Fan *et al.*, 2010), suggesting these two branches are not distinguishable. In addition, some factor-analytic studies questioned the

existence of the factor of “facilitating emotions” (Fan *et al.*, 2010). Therefore, a three-factor model, including “perceiving emotions”, “understanding emotions” and “managing emotions”, has increasingly reached consensus as being the best fit model in the area of ability EI research (Austin, 2018).

3.2.2 Trait EI and measures

Trait EI focuses on the subjective perception of emotions and self-reported evaluation of one’s competency in managing emotional information, which is more closely related to personality traits (e.g., Bar-on, Jamon and Barshavit, 1997; Petrides and Furnham, 2001). Trait EI is usually assessed with self-report tests (e.g., EIS - Emotional Intelligence Scale; TEIQue - Trait Emotional Intelligence Questionnaire).

Schutte and colleagues (1998) designed the Emotional Intelligence Scale (EIS) based on the original EI conceptualization, aiming to assess EI as a single construct. However, some researchers argued that EIS was better represented by four factors including Appraisal of Emotion (in the self and others), Expression of Emotion, Regulation of Emotion (in the self and others), and Utilization of Emotion (in solving problems) (Gignac *et al.*, 2005). Recent studies have found that EIS captured much broader content, such as general self-efficacy, than the ability model (Joseph *et al.*, 2015). In addition, its correlation with some personality traits were found to be moderate to large (Brackett and Mayer, 2003). Therefore,

the EIS is considered to measure trait EI (Joseph *et al.*, 2015). Another commonly used trait measure was the Genos Emotional Intelligence Inventory or Genos EI, which was designed specifically for workplace application (Palmer *et al.*, 2009), and is a self-report and rater-report assessment of “typical EI performance”. Genos EI focuses on the frequency of individuals demonstrating emotionally intelligent behaviours in the workplace, rather than assessing EI itself (Palmer *et al.*, 2009). This model consists of seven dimensions, such as Emotional Self-Awareness, Emotional Expression, and Emotional Self-Control.

A comprehensive trait EI model proposed by Petrides and Furnham (2001) expanded Bar-On’s (1997) definition. They defined EI as “a constellation of emotional traits and self-perceptions located at the lower levels of personality hierarchies” (Petrides, Pita and Kokkinaki, 2007, p. 287). Petrides and Furnham (2003) then proposed a measure of EI called the Trait Emotional Intelligence Questionnaire (TEIQue). This model consists of 15 different facets of EI, such as adaptability, emotion perception (self and others), relationships, stress management, and self-esteem, that stemmed from a content analysis of early models of EI and related constructs (Petrides and Furnham, 2001). Further factor analysis found that these 15 facets have loadings on 4 factors: Emotionality (facets: emotion-perception, empathy, emotion expression, and relationships), Self-control (facets: emotion control, impulsivity, and stress management), Sociability (facets: emotion management, assertiveness, and social awareness), and Well-being (facets: happiness, optimism, and self-esteem) (Petrides *et al.*, 2011).

Furthermore, another two facets, adaptability and self-motivation were categorized directly into the global trait EI score.

Although each trait EI measure covers a slightly different area of the domain, the correlations between overall scores of different measures are strong (Van Rooy, Viswesvaran and Pluta, 2005; Beath, Jones and Fitness, 2015). Trait EI is also found to be generally correlated with personality traits (Siegling, Furnham and Petrides, 2015). However, criticism of ability EI is mainly around whether trait EI can be a distinct component within the personality domain. Meta-analytic studies show incremental validity of trait EI beyond intelligence and personality in predicting job performance (Joseph and Newman, 2010b; O'Boyle Jr *et al.*, 2011). Systematic study of the incremental validity of trait EI found the TEIQue consistently accounts for incremental variance in the criteria relating to many areas over the basic dimensions of personality and other related variables (Andrei *et al.*, 2016). The TEIQue also showed incremental validity over personality in predicting multiple psychological criteria (e.g., aggression, loneliness, happiness, and life satisfaction), with a larger incremental effect than the EIS (Gardner and Qualter, 2010). However, it should be noted that these larger effects may indicate that the TEIQue overlaps more with certain criteria than other measures rather than mean that the TEIQue is better than other tests.

3.2.3 Distinction between ability EI and trait EI

The distinct psychometric approaches to ability and trait EI are similar to the different assessments of intelligence and personality. Thus, as expected, the correlations between ability EI and trait EI have been found to be small (Joseph and Newman, 2010a; Di Fabio and Saklofske, 2014), indicating that the two types of measurements assess distinct constructs. It is understood that assessing the ability of possessing emotion knowledge and skills is different from evaluating confidence in emotional ability. Although ability and trait models are different constructs, both of them include intrapersonal and interpersonal EI aspects. This allows theoretical connections to be established to other intra- and interpersonal processes.

3.2.4 EI and psychological well-being

EI has been suggested to play a key role in avoiding psychological maladjustment and in promoting well-being. Emotionally intelligent people are more able to perceive their own and others' emotions, so that they are able to manage emotions and combine emotional experiences with thoughts and actions in order to reduce negative emotions and better adapt to different contexts around them (Zeidner and Matthews, 2018). Consequently, EI appears to be closely linked to many beneficial life outcomes such as better psychological and physical health (Schutte *et al.*, 2007; Martins, Ramalho and Morin, 2010), relationship satisfaction (Smith, Heaven and Ciarrochi, 2008), effective coping strategies (Resurrección, Salguero and Ruiz-Aranda, 2014), high self-esteem and optimism (Martins,

Ramalho and Morin, 2010). These correlations remain significant after considering higher order personality dimensions such as the Giant Three and the Big Five (Andrei *et al.*, 2016). In addition, meta-analytic studies indicate that EI can be improved using specific training carried out with healthy populations (Hodzic *et al.*, 2018; Mattingly and Kraiger, 2019). Investigating the relationship between EI and psychological well-being may have implications for developing specific training programmes on EI, thus promoting well-being and avoiding distress.

Three meta-analytic investigations provided systematic evidence of the relationship between EI and health with diverse indicators (Schutte *et al.*, 2007; Martins, Ramalho and Morin, 2010; Sánchez-Álvarez, Extremera and Fernández-Berrocal, 2016). Schutte and colleagues (2007) conducted the first meta-analytic study in the area of the relationship between EI and health (Martins, Ramalho, and Morin, 2010). This study aimed to estimate the overall correlations between EI and physical health, mental health, and psychosomatic health, separately, and to examine potential moderating factors such as gender or age. A search of 2 databases was conducted, with no start date and an end date of 2006. A total of 35 articles were included and produced 44 effect sizes based on 7898 participants. The age of included participants ranged from 11 to 51 years old. Participants were coded as adolescents, adults, and a mixed sample. Twenty of the included studies used a student sample and three of them used adolescents. The meta-analysis included studies using one of the following EI measures, the MSCEIT (Mayer, Salovey and Caruso, 2002), the MEIS (Mayer, Caruso and Salovey, 1999), the EIS

(Schutte *et al.*, 1998), the Emotional Quotient Inventory (EQ-i; Bar-On, 1997), and the Trait Meta Mood Scale (TMMS; Salovey *et al.*, 1995), or used two or more of them. Mental health indicators contained measures of symptoms from the Diagnostic and Statistical Manual-IV-TR (American Psychiatric Association, 2000), such as measures of anxiety or depression. Physical health indicators involved measures of medical conditions, such as assessments of physical symptoms and pain. Psychosocial health indicators included scales of characteristics of both mental and physical health, such as scales of chronic fatigue. Results found that higher EI was correlated with better health, with weighted mean correlation coefficients of .29 for mental health, .31 for psychosomatic health, and .22 for physical health. Trait EI was more strongly correlated with mental health than ability EI. Of the three trait EI measures, the EQ-i (Bar-On, 2000) had the strongest correlation with mental health than others. Gender was found to be a moderator between EI and mental health. However, some important information was missing in the meta-analysis. For example, the details of inclusion/exclusion criteria, and the process of study selection were not reported. The gender of participants was also not reported. This review did not use valid tools to appraise the quality of included studies, thus was unable to have an overview of the quality of this research area.

Martins and colleagues (2010) conducted a comprehensive meta-analysis of the relationship between EI and health. This study aimed to extend Schutte and colleagues' study in 2007, by including articles published after the date reviewed

by them, articles written in non-English, and doing a cumulative meta-analysis. EI measures were categorised as trait task and ability task. In the same way as Schutte *et al.*'s (2007) study, health was classified as mental health, physical health, and psychosomatic health, adopting the same criteria. A search of 11 electronic databases was conducted. Keywords were searched in English, Portuguese, Spanish and French. The dates included in search ranged from 2006, the end date of Schutte *et al.*'s (2007) study, to 2010. The inclusion criteria included studies reporting precise statistical tests of the correlation between EI and health, using adults or adolescents, reporting at least one of the three health indicators, and assessing at least three or four branches of EI. Studies that measured other but related constructs, such as social intelligence, were excluded. A total of 46 studies were included and quantitatively synthesised producing 63 effect sizes based on 11917 participants. As an extension of Schutte *et al.*'s (2007) study, the present analysis finally integrated a total of 80 studies and produced 105 effect sizes based on 19,815 participants. One study in the original analysis was excluded because only one EI branch was measured. The mean age of included participants ranged from 15 to 53 years old. Most participants were students. The trait tasks involved in this analysis include the TMMS (Salovey *et al.*, 1995), the EIS (Schutte *et al.*, 1998), the EQ-i (Bar-on, 1997), and the TEIQue (Petrides, Pérez-González and Furnham, 2007); ability tasks included the MSCEIT (Mayer *et al.*, 2003) and the MEIS (Mayer *et al.*, 1999). The results were that trait EI ($r = .34$) was generally more strongly correlated with health than ability EI ($r = .17$). The weighted mean correlation coefficient with mental health was .36, with

psychosomatic health was .33, and with physical health was .27. Among trait EI measures, TEIQue ($r = .50$) presented the strongest correlation with mental health, and EQ-i ($r = .44$), SEIS ($r = .29$) and TMMS ($r = .24$) followed. However, due to no clear criteria about research settings or populations being reported, this meta-analysis might mix results of clinical and non-clinical populations, and adolescence and adulthood populations. No quality appraisal was reported. The process of study selection was also not reported.

Sánchez-Álvarez, Extremera, and Fernández-Berrocal (2016) conducted a meta-analysis of the relationship between EI and subjective well-being. The aim was to examine the empirical correlations between different EI theoretical constructs and subjective well-being with diverse indicators. EI measures were categorised as self-report ability tests, self-report mixed tests, and performance-based ability tests. Subjective well-being was categorised as affective well-being and cognitive well-being. By contrast with the previous two meta-analytic studies which focused on distress, the current meta-analysis focused on well-being. A search of 5 databases was conducted, with a time range between 1999 and 2013. The inclusion criteria contained studies reporting precise correlation coefficients of the target relationship, using at least 50 participants, conducting between 1999 and 2013, written in Spanish, French, English, Italian and Portuguese, and adopting cross-sectional or longitudinal study designs. Published or unpublished studies were both included. A total of 2491 articles were identified, and 25 of them were included in a quantitative synthesis. A total of 77 effect sizes were

produced based on 8520 participants, with a mean age of 21 years old. Self-report ability tests involved in this analysis include the TMMS (Salovey *et al.*, 1995), the EIS (Schutte *et al.*, 1998), the Swinburne University Emotional Intelligence Test (SUEIT; Palmer and Stough, 2001), and the Wong Law Emotional Intelligence Scale (WLEIS; Wong and Law, 2002). Self-report mixed tests involved the Emotion identification skills (Bagby, Parker and Taylor, 1994), the EQ-i (Bar-on, 1997), and the TEIQue (Petrides, Pérez-González and Furnham, 2007). The performance-based ability test used was MSCEIT (Mayer *et al.*, 2003). Measures of affective well-being involved the Positive and Negative Affect Schedule (PANAS; Watson, Clark, and Tellegen, 1988), the Subjective Happiness Scale (SHS; Lyubomirsky and Lepper, 1999), and the Life Space Scale (LSS; Brackett and Mayer, 2006). Cognitive well-being was measured by the Satisfaction with life Scale (SWLS; Diener *et al.*, 1985). The results found that EI was positively correlated with subjective well-being with a coefficient of .32. Self-reported mixed EI measures showed the strongest correlation with well-being ($r = .38$), followed by self-report ability EI measures ($r = .32$) and performance-based ability EI measures ($r = .22$). However, this study did not report details about the included studies and no quality appraisal was reported. Whether the focus was clinical or non-clinical populations was not clear.

In addition, Baudry and colleagues (2018) conducted a systematic review of the relationship between sub-dimensions of trait EI and health. This study aimed to highlight the understanding of the association between sub-dimensions of trait EI

and self-reported health in both clinical and non-clinical populations. A search of 5 databases was conducted, with no start date and an end date of 2016. The inclusion criteria contained studies using valid trait EI measures and valid health measures, testing the link between sub-dimensions of EI and health indicators. They included studies where the participants were over 18 years old, were written in English, and peer-reviewed and published. A total of 503 articles were identified, and 42 of them were included. Trait EI measures involved in this study were the TMMS (Salovey *et al.*, 1995), the EIS (Schutte *et al.*, 1998), the EQ-i (Bar-on, 1997), and the TEIQue (Petrides, Pérez-González and Furnham, 2007). Health indicators involved mental health such as general mental health, psychiatric disorders, anxiety, or depression; physical health such as general self-reported physical health or somatic symptoms; or general health such as combinations of mental and physical complains. Most included studies focused on mental health and used cross-sectional designs in non-clinical population. The TMMS was the most commonly used measure. Results indicated that trait EI sub-dimensions had greater associations with better mental health than physical and general health. Intrapersonal EI sub-dimensions had stronger associations with health than interpersonal EI sub-dimensions. Emotion regulation presented stronger associations with all three categories of health indicators. Clinical participants showed lower levels of EI sub-dimensions than non-clinical participants. Information about quality appraisal was not reported. This systematic review highlighted the importance of studying the EI sub-dimensions, which enhanced the understanding of the role of specific EI components in health.

In summary, meta-analytic studies and systematic reviews demonstrate greater associations between psychological well-being and trait EI than ability EI (e.g., Schutte *et al.*, 2007; Martins, Ramalho and Morin, 2010). For hedonic well-being, trait EI has been found to be positively associated with both affective and cognitive components across various studies in university students and adult samples (e.g., Palmer, Donaldson and Stough, 2002; Gignac, 2006; Sánchez-Álvarez, Extremera and Fernández-Berrocal, 2016; Kong *et al.*, 2019), even after controlling for some covariates such as personality and socioeconomic factors (e.g., Extremera and Fernández-Berrocal, 2005; Gohm, Corser and Dalsky, 2005; Ruiz-Aranda, Extremera and Pineda-Galán, 2014). For eudaimonic well-being, relatively limited research has assessed its relationship with trait EI, but most studies reported a significant positive relationship between them (e.g., Di Fabio and Kenny, 2019; Salavera and Usán, 2020). For psychological distress, a substantial number of studies have found stronger negative associations between trait EI and distress indicators than ability EI (e.g., Martins, Ramalho and Morin, 2010). These findings suggest that trait EI would be a more appropriate focus of the thesis due to its stronger association with psychological well-being than ability EI. However, of these studies focusing on the association between trait EI and well-being, few look into the role of trait EI assessed by TEIQue (Di Fabio and Kenny, 2019). Further studies are required to examine the relationships between trait EI, measured by TEIQue, and psychological states across different samples.

3.3 Introduction to humour styles

Humour has been demonstrated as a prosocial and health-promoting construct. Some aspects of humour have been reported to beneficially affect mental health (Bennett and Lengacher, 2008; Schneider, Voracek and Tran, 2018) and some aspects of physical health (Lefcourt, Davidson-Katz and Kueneman, 1990; Lefcourt *et al.*, 1997; Martin, 2001). However, several studies have reported that particular facets of humour showed potentially detrimental functioning, for instance, excessive self-disparaging humour can lead to deteriorating effects on self-esteem and relationship satisfaction (e.g., Martin *et al.*, 2003). The concept of humour has become poorly defined and vague due to the multi-faceted nature of humour. Of the many existing definitions, the majority of researchers increasingly agree that sense of humour can be conceptualized as a multi-dimensional construct and refers to a relatively stable personality trait (Ruch, 1998), and a set of cognitive, emotional and social abilities to understand, respond to and produce humour in daily life (Martin and Ford, 2018a). However, no agreement has been reached by all researchers on the systematic categories of humour. The Humorous Behaviour Q-sort Deck (HBQD; Craik, Lampert and Nelson, 1996) identified ten styles (five bipolar styles) of humorous behaviours in everyday situations. The Comic Style Markers (CSM; Ruch *et al.*, 2018) identified eight comic styles related to certain properties of humour. The Humour Styles Questionnaire (HSQ; Martin *et al.*, 2003) identified four types of humour based on the specific ways that individuals prefer to engage with humour in daily life. The currently most widely used measure to assess humour styles is the HSQ which was chosen for use in the present study.

3.3.1 Humour Styles Questionnaire (HSQ)

The HSQ (Martin *et al.*, 2003) identified four types of humour based on the specific ways that individuals prefer to engage with humour. Considering the different functions of humour as a way to enhance the self, or as a way to enhance the relationships with others, humour was separately conceptualized as intrapersonal humour and interpersonal humour. Similarly, according to the benign or detrimental psychological function of humour, humour was also distinguished as adaptive humour and maladaptive humour. Consequently, four trait-based humour styles were summarized: self-enhancing humour (intrapersonal, adaptive), affiliative humour (interpersonal, adaptive), self-defeating humour (intrapersonal, maladaptive) and aggressive humour (interpersonal, maladaptive) (Martin *et al.*, 2003). It should be noted that these four dimensions of humour styles are not mutually exclusive. These styles can be distinguished from one another but also there is overlap between them (Martin *et al.*, 2003).

Self-enhancing humour relates to a humorous and positive perspective on life even in stressful and adverse situations. Individuals with high self-enhancing humour tend to use humour for emotional regulation or as a coping mechanism (Martin *et al.*, 2003) that may help people to maintain a positive outlook on negative events while avoiding negative emotions. Self-enhancing humour tends to facilitate emotional regulation in a resilient way to perceive adversity as an opportunity rather than menace (Kuiper, Kirsh and Maiolino, 2016). Therefore, the concept of

self-enhancing humour is usually close to coping humour (Martin, 1996) which helps improve self-esteem and avoid negative emotions.

Affiliative humour refers to “respectful jokes and spontaneous witty banter” that delight others in a harmonious way (Martin *et al.*, 2003, p.53). Individuals with higher levels of affiliative humour tend to share non-hostile jokes and positive mirth that improve relationships and reduce tensions (Martin *et al.*, 2003). They are more likely to amuse others in a self-deprecating way but do not take themselves overly seriously, thus improving interpersonal attraction, relationship satisfaction and positive moods and emotions (Martin *et al.*, 2003).

Self-defeating humour refers to allowing individuals to amuse others by talking or doing things at the expense of themselves in order to obtain approval or attention from others. Individuals with self-defeating humour tend to allow themselves to be the “butt of the joke” (Martin *et al.*, 2003, p.53). Thus, self-defeating humour may lead to increased social isolation (Kuiper, Kirsh and Leite, 2010) and decreased social and emotional support due to the lack of perceived emotional neediness and high self-esteem (Fabrizi and Pollio cited in Martin *et al.*, 2003).

Aggressive humour involves the use of disparaging humour to put others down. Individuals with higher aggressive humour are more likely to hurt or alienate others by using humour with little consideration for the underlying negative impact on others, so that it is seen as related to aggressive behaviours and hostility

(Martin *et al.*, 2003).

A recent factor-analysis study demonstrated the validity of HSQ for assessing humour styles in a sample of health-care professionals (Leñero-Cirujano *et al.*, 2023). The four humour styles were reproduced in this study, and explained 44.46% of the total variance (Leñero-Cirujano *et al.*, 2023). Self-enhancing, affiliative and self-defeating humour styles showed incremental validity over personality and the previous day's mood in predicting happiness and psychological well-being (Páez, Mendiburo Seguel and Martínez-Sánchez, 2013). However, Ruch and Heintz (Ruch and Heintz, 2017; Heintz and Ruch, 2018) argued that the self-defeating subscale failed to fully capture the construct explanations and definitions of self-defeating humour as outlined by Martin *et al.* (2003). They found self-defeating humour was positively correlated with self-esteem, with an enhancement of individual's interpersonal relationships, and with positive emotions in facial expression (Heintz and Ruch, 2018). It seems that self-defeating humour sometimes is benign for psychological well-being. This result may be because the difference between potentially adaptive and maladaptive uses of humour is to what extent individuals use it, rather than binary choices (Martin *et al.*, 2003). For example, affiliative humour may enhance group cohesiveness by gently teasing and poking fun at someone (gentle aggressive behaviour) who is a member of this group (Martin *et al.*, 2003). Self-defeating humour may be helpful with affiliating with others by gently making a fool of one's self therefore amusing others. In addition, the HSQ may not be able to cover all aspects of humour. A recent study

distinguished nine styles of humour based on a combination of the HSQ and Comic Style Markers Questionnaire (Ruch *et al.*, 2018). The additional humour styles (nonsense, wit, irony, satire, and cynicism) were found to be associated with criterion variables such as personality traits (Ruch *et al.*, 2018).

Also, Martin and colleagues (2003) suggested that it is not assumed that individuals use humour as a consciously selected strategy, because humour could be an unconscious response, similar to a defense mechanism (Freud, 1928; Vaillant, 1977), to cope with adversity. Martin and Kuiper (1999) conducting a 3-day daily diary study found that, about 11% of daily laughter is elicited by jokes, 17% are responses to performance humour such as stand-up comedy, and 70% arise spontaneously during social communications. These suggest that a single quantitative study using HSQ is less likely to obtain a relatively comprehensive understanding of humour in daily life, because unconscious humour is difficult to capture using questionnaires. A combination of quantitative design with other methods such as qualitative or experimental design is needed to provide an in-depth understanding of humour styles in daily life.

3.3.2 Humour styles and psychological well-being

Substantial numbers of studies have looked into associations between humour styles and psychological well-being. Adaptive humour styles (affiliative and self-enhancing humour styles) have been indicated to be beneficial for well-being; the

use of these two humour styles was linked with more positive outcomes such as positive affect, greater life satisfaction, and better self-esteem; and less related to negative outcomes such as depression, anxiety, and loneliness (e.g., Martin *et al.*, 2003; Kuiper and McHale, 2009; Dyck and Holtzman, 2013; Yue, Wong and Hiranandani, 2014). In contrast, self-defeating humour was found to be detrimental to well-being (Dyck and Holtzman, 2013; Yue, Wong and Hiranandani, 2014). In addition, these three styles of humour specifically contribute to well-being beyond the contributions of personality factors or other emotion-related constructs (Páez, Mendiburo Seguel and Martínez-Sánchez, 2013; Ruch and Heintz, 2013). In terms of aggressive humour, existing studies suggest that this humour style is less related to well-being (e.g., Dyck and Holtzman, 2013; Yue, Wong and Hiranandani, 2014), but positively linked with aggression and hostility (Martin *et al.*, 2003; Chen and Martin, 2007). Furthermore, genetic and environmental factors were found to influence the development of adaptive humour in US and UK samples, and to impact maladaptive humour in a UK sample. Only environmental factors were found to impact maladaptive humour in a US sample, suggesting training may be helpful in fostering adaptive humour and modifying the use of maladaptive humour (Vernon *et al.*, 2008, 2009). Vernon *et al.* (2009) also suggested that developing specific training on the use of humour might improve well-being and reduce distress by fostering benign humour and modifying detrimental use of humour.

Two meta-analysis studies investigated the association between humour styles and

psychological well-being (i.e., Schneider, Voracek, and Tran, 2018; Jiang *et al.*, 2020). Schneider and colleagues (2018) aimed to provide meta-analytical evidence of the correlations between different humour styles and self-esteem, life satisfaction, optimism, and depression, from cross-sectional studies in non-clinical settings. A search of 11 electronic databases was conducted. The search was from 2003 to 2015. The inclusion criteria included empirical studies reporting correlation coefficients between humour styles assessed by HSQ and four well-being indices assessed by valid instruments, articles written in English, and peer reviewed studies and unpublished masters theses. Studies using a modification, or part, of the HSQ, conducted in clinic settings or with clinical samples, and longitudinally designed studies were excluded. A total of 1929 articles were identified, and 37 of them were included in the quantitative synthesis. The total number of participants from the 45 independent samples included was 12,734. The age ranged from 18.6 to 37.1, with an average of 22.7 years. Most included studies were conducted in North America, Asia, and Europe. Affiliative humour and self-enhancing humour were positively correlated with self-esteem, life satisfaction, and optimism, and negatively correlated with depression, with small to medium effect sizes for all correlations. Self-defeating humour was found to be negatively correlated with the three positive indicators, and negatively associated with depression, with a medium-sized effect. Aggressive humour appeared to be negatively correlated with self-esteem and positively associated with depression, only among Asian samples, with the lowest effect sizes for all correlations. Gender (female vs. male) and geographic (Eastern vs. Western)

differences were found in some of these correlations, with mixed results. However, 14 of 37 included studies did not report gender information. And no quality appraisal was reported.

Jiang and colleagues (2020) conducted a meta-analysis on the relationship between humour styles and subjective well-being. Subjective well-being in this review referred to measures including “anxiety, distress, subjective happiness, stress, positive affect, negative affect, depression, optimism, self-esteem, life satisfaction, school satisfaction, job satisfaction, loneliness, extraversion, neuroticism, flourishing, and so forth”, and were coded as positive well-being and negative well-being. Four humour styles were coded as adaptive humour (affiliative and self-enhancing) and maladaptive humour (aggressive and self-defeating). This study aimed to provide effect sizes of the correlations between humour styles and positive and negative well-being, and to test the moderating effects of culture and age on this correlation. A search of 3 electronic databases was conducted. The search was from 2003 to 2019. The inclusion criteria were similar to Schneider *et al.*'s study (2018), and additionally included studies written in Chinese and studies using an experimental design or randomized (or non-randomized) controlled trials, but research settings (i.e., clinical vs. non-clinical) were not clearly defined. A total of 69,200 articles were identified, 85 of these articles were included in a quantitative synthesis, with a total of 27,562 participants. This meta-analysis divided age into four groups according to different development stages, that was, children (6-12 years old), adolescents

(12-18 years old), young adults (18-22 years old), and adults (older than 22). Around 28% of included studies were conducted in East Asian countries. Results indicated that adaptive humour styles were positively associated with subjective well-being, whereas maladaptive humour styles were negatively associated with subjective well-being. Different from Schneider *et al.*'s study (2018), age and culture were not found to play a moderating role between humour and subjective well-being. However, this study combined self-enhancing and affiliative humour as adaptive humour, and self-defeating and aggressive humour as maladaptive humour, to calculate effect sizes, which may contaminate the findings of relationships between well-being and each humour style. For example, self-defeating humour was found to be not always negative in some contexts (Ruch and Heintz, 2017), and aggressive humour was found to be less likely to be associated with well-being indices (e.g., Schneider *et al.*, 2018). This study did not define the target populations. Similarly, some included studies did not report age, and the defined age groups did not cover all included studies. This study also did not report details on included studies and quality appraisal.

Meta-analysis studies support the simple correlations between each humour style and well-being indicators, however, individuals may use combinations of humour styles in daily life because humour styles are not mutually exclusive. Humour researchers argue that simple correlations tend to be misleading (Galloway, 2010; Leist and Müller, 2013; Fox, Hunter and Jones, 2016). Findings from cross-sectional studies using cluster analysis with adult samples suggested that humour styles are

“context-dependent” and cannot be simply considered as adaptive or maladaptive (Galloway, 2010; Leist and Müller, 2013). For example, self-enhancing humour was found to be the most beneficial style for well-being, compared to the other three, when it was used in the context of maladaptive humour styles being absent (Leist and Müller, 2013). In addition, findings of a longitudinal study in children indicated that self-defeating humour was less likely to be detrimental to well-being when used in combination with other humour (Fox, Hunter, and Jones, 2016). This may suggest that sometimes the disparaging functions of self-defeating humour tend to be diminished or balanced to some degree by other humour styles when they are combined with other humour styles (Fox, Hunter, and Jones, 2016). Also, aggressive humour was found to be used more in combination with other styles, and could be beneficial when combined with affiliative humour (Fox, Hunter, and Jones, 2016). Although whether such findings in children can be generalised to wider populations is not clear, these results enhance the understanding of the ways in which humour styles are used daily across the lifespan.

3.4 The connection between EI and humour styles

EI and humour styles have separately established connections with criterion outcomes such as health and well-being, suggesting potential associations between EI and humour styles. Although a detailed theoretical framework connecting them is currently lacking, the following emotion-related theories provide helpful demonstration of the associations.

A relationship between EI and humour styles might be explained by the Differential Emotions Theory (DET), which considers emotional motivation as a crucial component of EI, and focuses on the adaptive, motivational, and cue-producing characteristics of emotions (Izard *et al.*, 2012). Emotions provide cues that guide thoughts and actions, motivate or direct behaviours, and may drive others' behaviours through emotional expressions (Izard, 2002). Effective use of these characteristics of emotions could facilitate thought-action patterns and appropriate responses in order to achieve better life outcomes (Zeidner, Matthews and Roberts, 2012). Consequently, greater emotional competence, such as better awareness and regulation of emotions, seems to be closely linked to adaptive humour (Vernon *et al.*, 2009). Difficulties in emotional competence, such as deficiency in perception and management of emotions, seems to be linked to maladaptive humour. Individuals engaging in self-defeating humour are less likely to understand and regulate emotions. They use humour in a self-disparaging way to gain approval from others (Martin *et al.*, 2003) and as a form of defensive denial to hide their negative feelings (Martin *et al.*, 2003). Likewise, those who engage in aggressive humour are possibly not able to understand others' emotions and manage their own emotions, resulting in provoking offence and alienating others.

These associations may also be due to the close relationship between EI and empathy. Empathy is conceptualised as the ability for individuals to perceive the emotions of others (affective empathy; Duan, Rose and Kraatz, 2002), and rationally take perspectives of others (cognitive empathy; Gladstein, 1983).

Empathy is considered as a crucial component of EI (Goleman, Boyatzis and McKee, 2013). For example, individuals engaging in affiliative humour are more able to perceive the emotional information of others (affective empathy) in order to amuse others and facilitate relationships. Affiliative humour is related to sensitivity to emotions. Those who are clearly aware of others' emotions know what the appropriate way is, and when is the proper timing, to say funny things (Vernon *et al.*, 2009). Individuals engaging in self-enhancing humour seem to be more able to manage emotional information. As a method of coping with stress and maintaining positive perspectives in adversity, self-enhancing humour is considered perspective-taking humour (Lefcourt *et al.*, 1995). The positive correlation between self-enhancing humour and EI seems to be because both contain cognitive empathy (Goleman, Boyatzis and McKee, 2013).

In addition, the pathway connecting EI and humour styles might be explained by the broaden-and-build theory of positive emotions, which hypothesizes that positive emotions broaden individuals' short-term perception, thoughts and actions, and build long-term personal resources (Fredrickson, 1998, 2001). The positive associations between EI and emotional well-being indicates better EI may lead to more positive emotions which result in more flexible and prosocial response tendencies (Fredrickson, 1998), and more broadminded coping strategies (Fredrickson and Joiner, 2002). Thus this links to humour styles since it has been considered as a coping strategy, or desirable response to the demands of everyday life (Martin *et al.*, 2003).

Empirical studies provide supportive evidence of these positive relationships between EI and adaptive humour styles (e.g., Greven *et al.*, 2008; Gignac *et al.*, 2014; Wang *et al.*, 2019). However, the correlations between EI components and maladaptive humour are less consistent than with adaptive humour, even though maladaptive humour styles are generally associated with a lower level of overall EI (Greven *et al.*, 2008; Vernon *et al.*, 2009; Wang *et al.*, 2019). This could be due to the inconsistent correlations between maladaptive humour and indicators of psychological well-being and adjustment. Self-defeating humour is not always detrimental to health. Positive relationships are found between self-defeating humour and well-being indicators (Ruch and Heintz, 2017; Heintz and Ruch, 2018), suggesting this subscale may not be able to entirely explain the concept outlined by Martin *et al.* (2003) and thus has an inconsistent relationship with EI. Aggressive humour has been found to be less likely to be associated with social adjustment (Yip and Martin, 2006) and psychological well-being (e.g., Schneider *et al.*, 2018), such that the weak relationship between aggressive humour and EI is not surprising. For example, the factors of Well-being and Sociability from the TEIQue are found to be not correlated with aggressive humour (Greven *et al.*, 2008).

Some inconsistent associations might be due to the heterogeneous correlations between empathy and aggressive behaviours. Meta-analysis studies found inconsistent relationships between affective empathy and aggressive behaviours among children and adolescents (Lovett and Sheffield, 2007), and only small variances were found to be shared between empathy and aggressive behaviours

among adults (Vachon, Lynam and Johnson, 2014). Findings of the correlations between cognitive/affective empathy and reactive/proactive aggression possibly explained these mixed relationships. Reactive aggression, referring to the spontaneous reaction to perceived threats, is commonly related to high emotional arousal and inadequate emotional regulation; proactive aggression refers to intentional and organized aggressive behaviours motivated by expected reward (Dodge and Coie, 1987; Raine *et al.*, 2006; Euler, Steinlin and Stadler, 2017). A recent empirical study among adolescents found negative correlations between cognitive/affective empathy and proactive aggression rather than reactive aggression, suggesting a weak correlation between reactive aggression and empathy (Euler, Steinlin and Stadler, 2017). Therefore, aggressive humour might involve more reactive than proactive aggressive behaviours and so is marginally associated with EI. On the other hand, it is possible that some EI measures are less likely to appropriately separate between cognitive and affective empathy, such that the associations between aggressive humour and EI components were inconsistent across different EI measures. For example, aggressive humour was negatively related to Emotional Perception (sub-component of ability EI), but not linked to Appraisal of Emotions (sub-component of trait EI) among university students (Wang *et al.*, 2019; Yip and Martin, 2006). Although whether some of these findings in adolescents can be generalised to wider populations is not clear, they provide possible explanations of these inconsistent associations regarding maladaptive humour styles and suggest further research among adults.

In general, EI is likely to be positively associated with adaptive humour, and negatively associated with maladaptive humour. It can be hypothesised that trait EI may have a closer relationship with humour styles than ability EI. As demonstrated previously, trait EI has stronger associations with health indices than ability EI thus it is more likely to have closer associations with humour styles than ability EI. For another, both trait EI measures and the HSQ assess trait-based constructs, thus may have a close relationship with each other. Trait EI measures assess EI as a personality trait, which usually reflects individuals' behavioural tendencies of managing emotions in real life (i.e., typical-performance). By contrast, ability EI measures assess EI as a cognitive ability, which reflects knowledge about the most effective strategy of managing emotions (i.e., maximum-performance) but which may not always be translated into behaviours in daily life (Brown, Qualter and MacCann, 2018). The HSQ assesses humour as a trait-like construct, which reflects individuals' behavioural tendencies of engaging different styles of humour in real life. Hence, it can be hypothesised that trait EI is more likely to have a closer relationship with humour styles than ability EI.

However, I have been unable to find any study that has systematically investigated the relationship between EI and humour styles to date. More attention should be drawn to this neglected relationship, especially to the relationship between each EI sub-factor and each humour style because certain humour behaviour may be related to particular emotional competence. Systematically reviewing the literature in this field can enhance the understanding of different theoretical

models (i.e., ability and trait) and sub-factors of EI, and their diverse relationships with each humour style. In addition, although trait EI theoretically may have closer associations with humour styles than ability EI, little systematic evidence supports this hypothesis. A systematic review of the relationship between EI and humour styles was conducted as the first study in the thesis, to provide a fuller picture of this relationship, test the hypothesis of trait EI having closer associations with humour styles than ability EI, and to identify potential gaps in the literature. Findings of the systematic review can inform the following empirical study and which EI model (i.e., trait EI or ability EI) would be more appropriately studied and which EI measure should be used in this thesis.

3.5 Affective Mediation Model for EI - psychological well-being relationship

Previous studies have explained the EI - psychological well-being relationship by exploring the mechanisms underlying this association. Empirical evidence based on cross-sectional studies suggested that social support (Kong, Zhao and You, 2012; Rey, Extremera and Sánchez-Álvarez, 2019), adaptive and maladaptive coping strategies (Chan, 2006; Extremera, Sánchez-Álvarez and Rey, 2020; Sanchez-Ruiz *et al.*, 2021), positive and negative affects (Liu, Wang and Lü, 2013; Extremera and Rey, 2016; Kong *et al.*, 2019; Salavera and Usán, 2020; Asif *et al.*, 2022), resilience (Akbari and Khormaiee, 2015; Ramos-Díaz *et al.*, 2019), and perceived stress (Ruiz-Aranda, Extremera and Pineda-Galán, 2014) mediated the effect of EI on both psychological well-being and distress. Two longitudinal studies found that

social support mediated the impact of EI on psychological well-being (Malinauskas and Malinauskiene, 2018, 2020). Zeidner *et al.* (2012) proposed an Affective Mediation Model (AMM) to explore the potential mechanisms that may explain the influence of EI on psychological well-being. They hypothesised that both intra- and inter-personal mechanisms can be helpful in understanding the processes. First, high EI individuals tend to cope adaptively with negative emotions, social demands, and challenges, in order to decrease stress and increase well-being (Salovey *et al.*, 1999). Thus, EI might be associated with a range of effective coping strategies (Zeidner and Matthews, 2000). Second, there is substantial evidence for the beneficial role of social support to mental health (Salovey *et al.*, 2000; Koydemir *et al.*, 2013; Kong *et al.*, 2019). More emotionally intelligent individuals may be more able to facilitate thought-action patterns and appropriate responses to social demands, leading to greater quality of relationships and richer social support, thus improving relationship satisfaction and enhancing psychological well-being.

3.5.1 The mediating role of humour styles based on the Affective Mediation Model

In the current thesis, humour styles, involving both intra- and inter-personal processes, are considered as mediating factors that may explain the mechanisms underlying the relationship between EI and psychological well-being. Emotionally intelligent people tend to effectively use emotional cues and facilitate thought-

action patterns and appropriate responses in order to achieve better psychological well-being. Therefore, it can be hypothesised that better EI is associated with more adaptive and less maladaptive humour thus linking to better psychological well-being.

There are three cross-sectional quantitative studies that have examined the mediating role of humour in this relationship (Greven *et al.*, 2008; Wang *et al.*, 2019; Huang and Lee, 2019). Findings from these studies are mixed. Greven *et al.* (2008) aimed to explore the potential mediating roles of lower-level dispositional factors (i.e., trait EI and humour styles) in the relationship between higher-level dispositional factors (i.e., personality) and health. A total of 1038 university students (738 females and 300 males) participated in this study, with the age ranging from 17 to 48 years old ($M = 24.15$, $SD = 6.29$). Data were collected online at University College London (UK) from undergraduate and postgraduate students, and at the University of Bamberg (Germany) from psychology undergraduate students. 74.2% of them were white participants. The hypothesised mediation model was composed of four categories of variables. Personality as the independent variable was measured by the Big Five Inventory (John and Srivastava, 1999). Trait EI considered as a closer dispositional factor than humour was treated as the first potential mediator between personality and health, which was measured by the TEIQue. Humour styles, followed by trait EI as the second mediator, were measured by the HSQ. General Health, considered as self-perceived mental well-being and distress, was included as the outcome variable,

and measured by the 12-item General Health Questionnaire (GHQ12; Goldberg and Williams, 1988). Pearson correlation, Structural Equation Modelling (SEM), and Sobel's mediation test (Sobel, 1982) were conducted. Results of the Pearson correlation revealed that the Big Five, trait EI and the adaptive humour styles were significantly and positively correlated with General Health. Trait EI and its sub-facets were positively correlated with adaptive humour, sometimes negatively correlated with self-defeating humour and aggressive humour. Aggressive humour was not correlated with General Health, such that it was excluded from the hypothesised mediation model. Results of SEM and mediation tests indicated that the global trait EI and each of the three humour styles fully mediate the relationship between four dimensions (Extraversion, Openness, Agreeableness and Conscientiousness) of the Big Five and General Health. The global trait EI and three humour styles partially mediated the path from Neuroticism to General Health. Specifically, affiliative humour, self-enhancing humour, and self-defeating humour fully mediated the link between global trait EI and General Health, which supported the AMM. However, the aim of this study was to test the mediating roles of trait EI and humour styles between personality and health, thus the mediating effect of humour styles between trait EI and health might be influenced by the Big Five personality. For example, full mediation effects of three humour styles were found between trait EI and health, which indicated that the three humour styles were the only mechanism by which trait EI was related to General Health. Humour, however, was considered one of many mediators of this link. In addition, aggressive humour was excluded from SEM due to there being no correlation with

health, but aggressive humour was not always uncorrelated with health and well-being. This suggests that aggressive humour may play a role between trait EI and health in other situations. Hence, the conclusions should be viewed with caution. Additionally, this study used university students but no discussion relating to this population was made. Further research is needed to independently study the mediation model based on particular populations.

Wang and colleagues (2019) aimed to explore the role of humour styles between trait EI and subjective well-being in Chinese university students. Participants were recruited using a convenience sampling method from each grade of undergraduate students in three universities in Henan Province, China. A total of 462 university students (237 females and 225 males) participated in the study, with the age ranging from 17 to 26 years old ($M = 21.16$, $SD = 1.51$). The hypothesised multiple mediation model was composed of three categories of variables. Trait EI was estimated as the independent variable and measured by the Chinese version of EIS (Schutte *et al.*, 1998) translated by Huang *et al.* (2008). Subjective well-being (i.e., positive affect, negative affect, and life satisfaction) as the dependent variables was measured by the Chinese version of the Positive Affect and Negative Affect Scale (Watson, Clark and Tellegen, 1988) translated by Zheng *et al.* (2004) and the Satisfaction with Life Scale (Diener *et al.*, 1985). Four humour styles assessed by the Chinese version of HSQ (Martin *et al.*, 2003; Chen and Martin, 2007; Chen, Watkins and Martin, 2013) were simultaneously estimated in the model as mediators. Pearson correlation, SEM, multigroup analysis, and mediation analysis

with bootstrapping were conducted. The results of Pearson correlation showed that trait EI, adaptive humour and self-enhancing humour were positively correlated with positive affect and life satisfaction, and negatively linked to negative affect. Aggressive humour and self-defeating humour were positively correlated with negative affect, but not correlated with life satisfaction and positive affect. Trait EI was positively correlated with two adaptive humour styles, and partially negatively correlated with two maladaptive humour styles. The links between Appraisal of Emotion (sub-dimension of EIS) and maladaptive humour styles were non-significant. Results of SEM showed that self-enhancing humour partially mediated the positive relationship between trait EI and positive affect and life satisfaction. Self-defeating humour partially mediated the negative association between trait EI and negative affect. Aggressive humour was tested in this study and not found to be a mediator in the model. In addition, multigroup analyses found no moderating effect of gender in the mediation model. However, affiliative humour was not found to be a mediator in the model. This result was inconsistent with Greven *et al.*'s (2008) study and the theoretical assumption (Martin *et al.*, 2003). Future studies are needed to test this mediation model. Additionally, substantial studies have found that trait EI is related to psychological distress such as anxiety and depression. To my knowledge, no study draws attention to this neglected relationship of EI - humour - distress. Research on the mediation relationship regarding distress indicators is needed to address this gap.

Huang and Lee (2019) aimed to test the potential mediating role of humour styles

between ability EI and life satisfaction. A total of 260 undergraduate students (168 females and 92 males) were recruited from the School of Continuing Education of National Taiwan Normal University. The age ranged from 19 to 28 years old, with a mean of 21.39 years ($SD = 2.39$). All participants were Chinese. Data were collected in a classroom as part of the students' course requirement. The hypothesised mediation model was composed of three categories of variables. Ability EI was estimated as the independent variable and measured by the Chinese version of EIS (Schutte *et al.*, 1998), translated by Chen (2008). Life satisfaction as the dependent variable was measured by the Chinese version of the Satisfaction with Life Scale (Diener *et al.*, 1985), translated by Wu and Yao (2006). Four humour styles were assessed by the Chinese version of HSQ (Martin *et al.*, 2003), translated by Chen, Su, and Ye (2011). Pearson correlation, and mediation analysis outlined by Hayes (2013) with bootstrapping were conducted. Results of Pearson correlation indicated that ability EI was positively correlated with affiliative humour, self-enhancing humour, and life satisfaction, and negatively related to aggressive humour and self-defeating humour. Affiliative humour and self-enhancing humour were positively correlated with life satisfaction. However, self-defeating humour was not correlated with life satisfaction, and aggressive humour was negatively related to life satisfaction. Simple mediation analysis showed that affiliative, self-enhancing, and aggressive humour styles mediated the paths from ability EI to life satisfaction, separately. Self-defeating humour did not play a role between ability EI and life satisfaction. Parallel mediation analysis revealed that only self-enhancing humour mediated the relationship between ability EI and life

satisfaction. The authors claimed that the EI construct measured using the EIS was ability EI, however, as mentioned before, the EIS captures broader content, such as self-efficacy, than the ability model (Joseph *et al.*, 2015), and the scores of EIS were found to have a moderate to large association with personality (Brackett and Mayer, 2003). Hence, the EIS is usually considered to measure trait EI (Joseph *et al.*, 2015). In addition, life satisfaction was the only included indicator of psychological well-being in this study. Affective well-being, eudaimonic well-being, and psychological distress should be considered in further research.

In general, findings from the three previous studies suggest that intrapersonal humour styles (self-enhancing and self-defeating humour) and adaptive humour styles (self-enhancing and affiliative humour) are more likely to play a role in the relationship between EI and psychological well-being. However, some limitations are identified, including no study deliberately focusing on a population, no study focusing on eudaimonic well-being or distress, and the contextual and unconscious characteristics of humour being neglected. In addition, some findings are inconsistent with the theoretical hypothesis, for instance, affiliative humour does not play a role in the link between trait EI and subjective well-being.

The current hypothesised mediation relationship was explored among university students in a university context. Although none of the previous studies intentionally focussed on a particular population, all of them used a convenience sample of university students. As mentioned in Chapter 2, most university students

are in a life stage called emerging adulthood, which is well-known to be characterised by neuro-plasticity (Andersen, 2003). Experiences during these years tend to have a lifelong impact on individuals (Demiray, Gülgöz and Bluck, 2009). Emerging adults suffer more psychological distress and have less well-being than in other life stages, due to their uncertainty and instability (Arnett, Žukauskienė and Sugimura, 2014). Testing well-being and distress separately in university students may obtain more nuanced and informative findings than examining a single construct or a combination of well-being and distress. During emerging adulthood, university students may develop clearer self-identity, better empathy, and greater emotion knowledge and skills, which are important for EI. The university is also a unique context which is different from both secondary school and the workplace. Increasing independence and diverse challenges, both social and academic, in universities require university students to have better skills and knowledge in perceiving, understanding, and managing their own and others' emotions than in secondary schools, in order to effectively respond to circumstances (Davis, 2018). EI tends to be particularly crucial for emerging adults in universities. Meanwhile, humour as a context-sensitive behaviour may differently function with different people in different contexts. Whether students can appropriately use humour with students with diverse backgrounds in university is significant for their psychological well-being. Additionally, research indicated that younger adults score significantly higher on affiliative and aggressive humour than older adults (Martin *et al.*, 2003), suggesting interpersonal humour may play different roles between EI and psychological well-being at different life stages.

Exploring the EI - humour styles - well-being/distress relationships in this transition period would enhance the knowledge of each construct on this neglected life stage, and reveal the potential mechanisms underlying this relationship during emerging adulthood. Findings might help with extending the understanding of existing theoretical constructs at a particular life stage, and inform the investigation of uncovered relationships that better reveal the complexity among EI, humour, and psychological well-being. Findings might also have implications for developing training programmes containing humour as a method to improve EI thus enhancing well-being and fostering the health-promoting use of humour that possibly improves psychological well-being during this life stage known for plasticity.

The aim of the second stage was to explore the role of humour styles in the relationship between EI and psychological well-being among university students and their perceptions regarding the role of humour in psychological well-being. The quantitative study aimed to explore the potential mediating role of humour styles in the link between EI and psychological well-being among university students and improve on some of the limitations identified in previous studies, by studying hedonic well-being, eudaimonic well-being, and distress separately, and deliberately focusing on a population of university students. The sequential qualitative study was conducted to gain insight into the role of humour in psychological well-being among home and international students with diverse EI levels in a university context, and identified unconscious humour behaviours.

Hence, a mixed methods study consisting of a quantitative study and a sequential qualitative study was conducted in the current thesis.

The Trait EI model was the EI model studied when exploring the mediation relationship between EI, humour styles, and psychological well-being. First, trait EI has been found to have a greater relationship with psychological well-being than ability EI from meta-analytic studies. Second, trait EI measures are more likely to have closer associations with the HSQ than ability EI measures because both assess trait-based constructs. However, a systematic review of the EI - humour styles relationship (both ability EI and trait EI) is needed to support this hypothesised close association, identify the most appropriate trait EI measure for the mixed methods study, and provide a better picture of the relationship between EI and humour styles.

The aim of the thesis was to explore the role of humour in the relationship between EI and psychological well-being among university students. This included a systematic review of the relationship between EI and humour styles, and a mixed methods study investigating the hypothesised mediation relationship.

3.6 Chapter summary

This chapter provided an overview of the conceptualisation and measurements of ability EI, trait EI, and humour styles, and their relationship with psychological

well-being. Trait EI presented stronger associations with psychological well-being than ability EI. The possible processes underlying the EI - psychological well-being relationship based on the AMM were discussed. Difference in Humour styles, involving both intra- and inter-personal processes, was hypothesised as one of the possible mechanisms that may explain the relationship between EI and psychological well-being.

Chapter 4 Methodology and Research Questions

4.1 Overview

This chapter focuses on the main methodological considerations in this doctoral research. It discusses the methodology based on the understanding of the philosophical principles and theoretical assumptions from psychology and the social sciences. It also explains the considerations regarding the decisions made about using specific research methods to address each research question outlined later in this chapter. Methodology involves the overall research process from the philosophical discussion to the following research methods, principles, and rules, whereas methods are specific procedures of data collection, data analysis, and potential explanations of findings (Silverman, 2006). This chapter will focus on the philosophical stance, the general methodology, then the details of methods adopted for each phase of the study according to each research question.

4.2 Philosophical stance

Philosophy underpins the process of acquiring knowledge of reality by supporting the general principles of theoretical thinking, providing cognitive methods and perspectives, and raising self-awareness (Spirkin, 1983). The meaningful and appropriate interpretation of social research, therefore, requires a basic understanding of the philosophical basis of the discipline (Heberlein, 1988; Mascia

et al., 2003; Newing, 2010). Moon and Blackman (2014) developed a research guide to support the meaningful interpretation of social research outcomes. The three fundamental components of the guide are: ontology, beliefs about the nature of reality and what exists; epistemology, beliefs about the nature of, and approach to, knowledge; and philosophical perspective (or paradigm), the beliefs that guide actions. Methodological decisions are guided by these three elements. There has been a variety of research approaches used in psychology and social research, with different ontological positions, epistemological positions, and philosophical perspectives.

Researchers could consider first their philosophical perspective, then their ontological and epistemological positions when embarking on research (Moon and Blackman, 2014). There are two principal philosophical perspectives on the spectrum of, positivism (or objectivism) at one end and interpretivism (or subjectivism) at the other end. Positivism claims that singular reality (ontology) can be acquired through the scientific method (epistemology) such as measurement and observation (typically quantitatively). The researcher is an “objective” scientist who is detached from their subjects and personal influence, and avoids the bias of the generation of knowledge (Pratt, 1998). By contrast, interpretivism claims that multiple realities (ontology) can be constructed by human beings engaging with, and interpreting, the world (Crotty, 1998). Different people may construct different interpretations of the same knowledge when using different approaches (epistemology). Interpretivists gain knowledge by studying

individual cases (typically qualitatively) such that researchers' biases and perspectives may influence the generation of knowledge (Patton, 2002).

For example, if the purpose of the research is to predict, it would involve positivism or post-positivism. Following these principles as a guide, the main purpose of the current research was three-fold: to understand the relationship between EI and humour styles; to explore the role of humour styles between EI and psychological well-being; and to explore how EI and humour affect psychological well-being in everyday situations. In addition, I intended to predict who, with different EI and sense of humour, is more likely to maintain better psychological well-being; and why they do so. Therefore, the philosophical perspective of the current research involves both positivist (objectivism) and interpretivist (subjectivism), that is, the stance of critical realism.

In general, philosophic realism is interpreted by Phillips (1987, p.205) as "the view that entities exist independently of being perceived, or independently of our theories about them". In the social sciences, the approach of the current research broadly falls within the most important manifestation, this is critical realism (Bhaskar, 1978; Robson, 2002). This position means an integration of a realist ontology (the reality exists independently of our perceptions, theories, and constructions) with a constructivist epistemology (the reality is inevitably constructed through our own perspectives, standpoint, and interpretations). This position also means that external reality is naturally diverse and multifaceted,

thus my research purpose is to access that reality in all its complexity and depth. Realism as a philosophical stance is compatible with both qualitative and quantitative research, and facilitates close and equal cooperation between the two approaches (Greene, 2000; Mark, Henry and Julnes, 2000).

4.3 Methodological considerations

The current research was considered as being exploratory work when the idea was first conceived. I aimed to understand more about the mechanisms involved in achieving desirable psychological well-being for university students with different EI levels and humour behaviours in Scotland. In order to achieve this purpose, the research was considered as taking place in three phases: identifying the evidence base using a systematic review (Stage 1), and then investigating empirical evidence using a mixed-method design consisting of a quantitative study (Stage 2) and a qualitative study. The research questions related to the three phases were:

Stage 1 systematic review

RQ1-1: what has been found in previous studies about the relationship between ability/trait EI and humour styles among adults in non-clinical settings?

RQ1-2: how do previous studies explain the relationship between ability/trait EI and humour styles among adults in non-clinical settings?

Stage 2 mixed methods study

RQ2: what is the role of humour styles in the relationship between trait EI and psychological well-being among university students and their perceptions regarding the role of humour in psychological well-being?

More specifically, for the quantitative study:

RQ2-1: what is the association between trait EI, humour styles, and psychological well-being?

RQ2-2: how do humour styles mediate the relationship between trait EI and psychological well-being?

For the qualitative study:

RQ2-3: what is the role of humour in psychological well-being among university students?

4.3.1 Stage 1 Identifying the evidence base

The relationships between EI and psychological well-being, and between humour styles and psychological well-being, have been systematically reviewed (see

chapter 3). However, the relationship between EI and humour styles has not been. Therefore, an evidence review was conducted to, identify the relevant and existing evidence relating to the relationship between EI and humour styles. The approach taken was a systematic review. Systematic reviews are becoming increasingly common due to their methodological rigour in many research fields such as health care and psychology (Moher *et al.*, 2015). A systematic review systematically synthesises the evidence on a clearly presented research question using critical methods to identify, collect, and evaluate studies relating to the question, and extracts and analyses data from these studies, then reports and gives high level conclusions (Lasserson, Thomas and Higgins, 2019).

Systematic reviews are described as being “methodical, comprehensive, transparent, and replicable” (Siddaway, Wood and Hedges, 2019). The following box 4-1 lists the conditions that can be fulfilled using such method.

Box 4-1 Advantages of using systematic review (Baumeister and Leary, 1997; Cooper, 2003; Baumeister, 2013; Bem, 2016)

- 1) *draw robust and broad conclusions by producing an unbiased summary of what the cumulative evidence says on a particular topic;*
- 2) *critique and synthesize one or more literatures by identifying relations, contradictions, gaps, and inconsistencies and exploring the reasons for these;*
- 3) *develop and evaluate a new theory or evaluate an existing theory or theories to explain how and why individual studies fit together;*
- 4) *provide implications for practice and policy; and*
- 5) *outline important directions for future research (e.g., highlighting where evidence is lacking or of poor quality).*

The nature of systematic reviews means that they have some advantages beyond other types of literature review (Siddaway, Wood and Hedges, 2019): first, they are more likely to produce higher quality, more comprehensive, and less biased outcomes than other reviews. A high-quality systematic review itself is an innovation and substantive contribution to knowledge. Second, systematic reviews provide relatively more robust methods to explain the scope, characteristics, and quality of the existing evidence on a specific research topic such that they contribute to the issue of replicability, promoting scientific rigour, and sustaining the good reputation of a research area. Systematic reviews are considered to be more reproducible and less biased than other types of literature review (Siddaway, Wood and Hedges, 2019).

The aim of the first phase was:

To understand from the current literature what we know about the relationship between EI and humour styles.

The Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines (Moher *et al.*, 2009) were followed to ensure the reliability and transparency of the review. As a reporting guideline for systematic reviews and meta-analysis, PRISMA is a set of evidence-based items for reporting in systematic reviews and meta-analyses, which can be used for reviews of evaluating interventions as well as an outline for a systematic review with other research topics (PRISMA, 2021).

PRISMA aims to help reviewers transparently report the rationale, the method, and the findings of the review (Page *et al.*, 2021). In order to reduce the duplication of work and the publication bias of systematic reviews, an international register - PROSPERO (International Prospective Register of Ongoing Systematic Reviews, <http://www.crd.york.ac.uk/prospéro>) was established. The current review was registered in PROSPERO (ID: CRD42018089334).

4.3.2 Stage 2 investigating empirical evidence

To test the mediating role of humour styles in the trait EI - psychological well-

being relationship, among university students, and gain insight into the role of humour in self-managing psychological well-being in a university context, were the central aims of this mixed method research. Humour styles were conceptualised as a multidimensional construct consisting of both conscious and unconscious components, for example, humour may be a chosen strategy or a spontaneous response to stressful situations (see Chapter 3; Martin *et al.*, 2003). In addition, humour behaviours are more likely to be affected by the context in which people engaged with humour. These features of humour are difficult to investigate using quantitative methods. Therefore, a mixed methods design consisting of quantitative and qualitative methods was chosen to address the research questions.

Mixed methods design has become increasingly important in social, behavioural, and health sciences. As the “third research paradigm” (Johnson and Onwuegbuzie, 2004, p. 14), mixed methods design is growing in popularity due to their advantage of addressing research questions more comprehensively (Teddlie and Tashakkori, 2009) and ability to generate more valid interpretations (Greene and Caracelli, 1997). Mixed methods research offers possibilities to use more creative thinking and to obtain knowledge beyond the traditional “quantitative-qualitative divide” (Mason, 2006). Mixed methods can provide a thorough representation of behaviours occurring in natural social contexts (Lieber, 2009), and reveal high-quality and complex inferences (Rauscher and Greenfield, 2009). Mixed methods research combines components of quantitative and qualitative research methods,

such as quantitative and qualitative paradigm, techniques of data collection and analysis, and interpretation of findings, to give a comprehensive understanding of a research topic (Johnson and Onwuegbuzie, 2007).

Mixed methods design usually consists of a core study and a supplemental study: the core study has its complete method; the supplemental study using different types of data, analysis, or strategies, provides findings of another area which is relevant to the research question but cannot be solved in the core study (Tashakkori, Teddlie and Morse, 2015). The dominant application of mixed methods studies is two-phase designs, typically combining quantitative and qualitative approaches. The research question directs and broadens the mixed methods design. For example, the research question relating to deductive analysis, such as about relationships or causation, is best answered using a quantitative method and driven by quantitative theories, that is, the complete method of the core study is a quantitative method which answers the majority of the research question. The supplementary study answers the rest of the research question that cannot be addressed by the chosen quantitative method, uses either a qualitative or quantitative method, and is conducted either simultaneously or sequentially with the core study. Similarly, if the research question is about inductive analysis, the core study is usually addressed by a qualitative method, and the supplementary study can use either a quantitative or qualitative method, and be conducted simultaneously or sequentially. It should be noted that in the supplementary study it is not necessary to use the same research paradigm as the

core study, that is, the qualitative component can use a different paradigm from the quantitative component, as in the current mixed method study. The findings of the supplementary study, rather than the analytic process, will be integrated with/into the findings of the core study, and the overall results will be presented with the theoretical basis/framework of the core study.

A quantitatively driven, sequential mixed methods design was adopted in the current research, to explore the role of humour in the relationship between EI and psychological well-being in university students. This design consisted of two phases of studies: phase 1 involved quantitative analysis of data collected from university students using validated tools; phase 2 involved qualitative analysis of an interview study, using a sample recruited from the preceding quantitative study. The interface of the two components is the results, each component adhering to its own paradigm when conducting the study.

The purpose of the mixed methods study was two-fold:

- (1) To conduct a cross-sectional questionnaire-based study to test the mediating role of humour styles in the relationship between trait EI and psychological well-being among university students (quantitative component).
- (2) To conduct semi-structured interviews to gain insight into the role of humour in self-managing psychological well-being in a university context (qualitative

component).

The quantitative phase informed the qualitative phase and provided the theoretical drive; and the qualitative phase helped to explain and extend the results of the quantitative phase. More specifically, the cross-sectional quantitative study explored the statistical evidence of the mediating role of humour styles in the relationship between EI and psychological well-being. The qualitative interviews with students, who have a wide range of characteristics including different EI levels, provided insight and lived experience about how humour helped them to self-manage well-being, and how humour functions differently from other health-promoting strategies. The qualitative findings may add evidence which is less likely to be obtained from statistical analysis, regarding the role of humour in well-being management (e.g., unconscious humour). A mixed methods study combining quantitative and qualitative findings will provide a more comprehensive understanding of how humour functions in self-management of psychological well-being among university students with various EI levels. Figure 4-1 illustrates this mixed methods design.

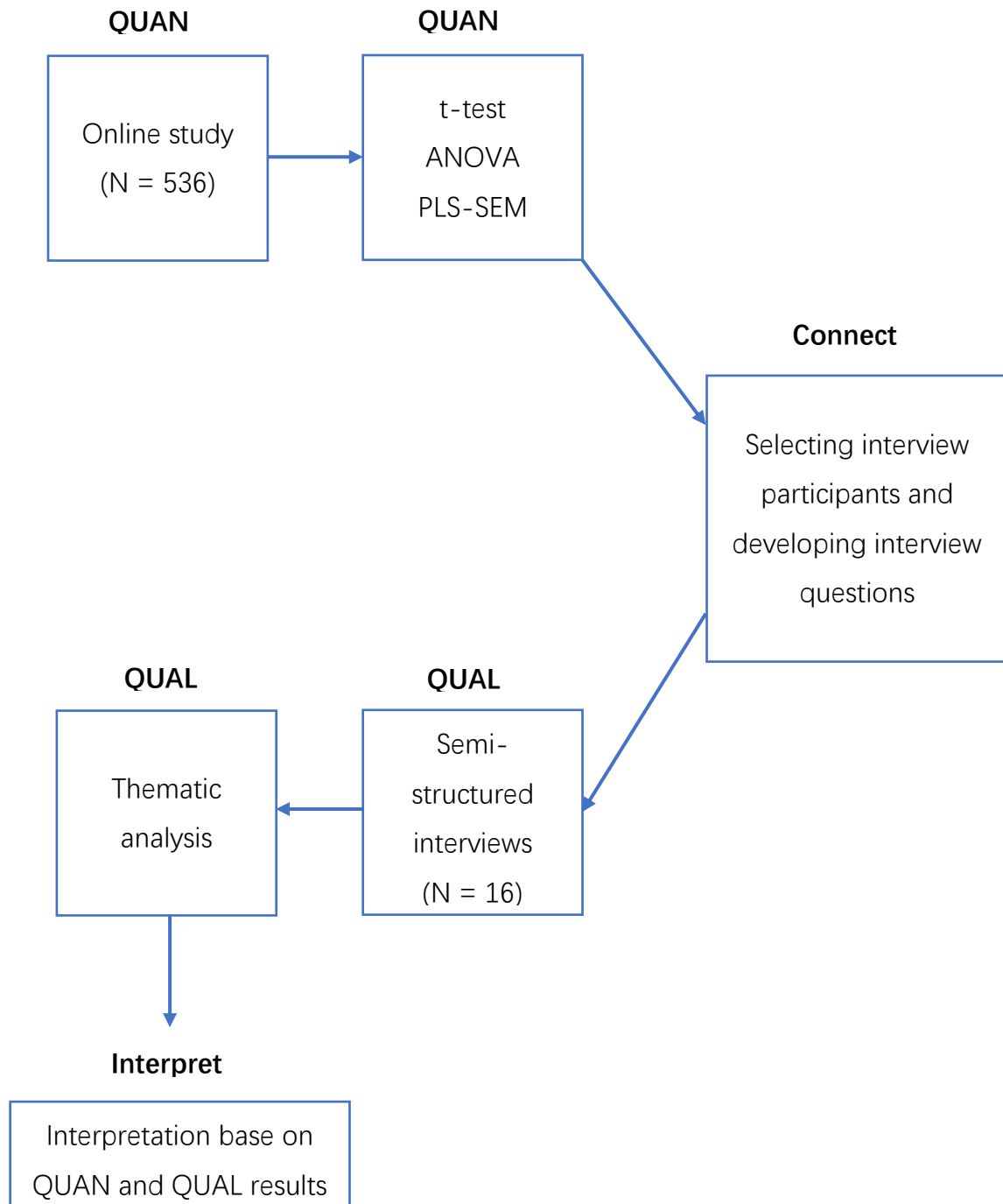


Figure 4-1 Sequential mixed methods design with a qualitative follow-up phase. QUAN = quantitative study, QUAL = qualitative study.

The methodological considerations of the two components will be described below.

4.3.2.1 Phase 1 Quantitative study

To address the purpose of the quantitative stage, specific research questions were developed, to recap:

RQ2-1: what is the association between trait EI, humour styles, and psychological well-being in university students?

RQ2-2: how do humour styles mediate the relationship between trait EI and psychological well-being among university students?

This Phase consisted of a pilot study and a full-scale study conducted at the University of Glasgow. A pilot study is usually a smaller-scale study performed as a first step to assist in planning and adjusting methods for the full study. Assessing the feasibility of the study design in advance is beneficial and increases the likelihood of obtaining high-quality outcomes. The full study was a cross-sectional study collecting quantitative information from undergraduate and postgraduate students. All participants were invited via email to take part in an online study.

The main outcome variables of interest were trait EI, humour styles (i.e., affiliative humour, self-enhancing humour, aggressive humour, and self-defeating humour), hedonic well-being (i.e., positive affect, negative affect, and life satisfaction), eudaimonic well-being, and psychological distress (i.e., anxiety and depression). Seven already validated tools were adopted to assess the variables. Demographic information, including gender, age, education, marriage status, self-

identified ethnic group or background, and country of origin of the students, was also collected. This information was collected because these characteristics might influence the outcome variables in the quantitative study, and they provided information for sampling in the qualitative study. The seven questionnaires are:

Trait EI

The Trait Emotional Intelligence Questionnaire - Short Form (TEIQue-SF, v. 1.50; Petrides, 2009) consists of 30 items and yields a global trait EI score and scores of four factors. This form includes two items from each of the 15 facets of the TEIQue. The four factors are Emotionality (e.g. "Expressing my emotions with words is not a problem for me."), Self-Control (e.g. "I usually find it difficult to regulate my emotions."), Sociability (e.g. "I can deal effectively with people."), and Well-Being (e.g. "I generally don't find life enjoyable."). Participants respond on a 7-point Likert scale (1 = disagree completely, 7 = agree completely). The Cronbach's alpha of each factor was around 0.69 in the original study (Petrides, 2009). Trait EI is a multidimensional construct which consists of four different sub-factors. Each factor is unidimensional and can be calculated by the sum of all relevant items.

Humour Styles

The Humour Styles Questionnaire (HSQ; Martin *et al.*, 2003) consists of 32 items

and yields scores for four humour styles, including affiliative humour (e.g. “I usually don’t laugh or joke around much with other people.”), self-enhancing humour (e.g. “If I am feeling depressed, I can usually cheer myself up with humour.”), aggressive humour (e.g. “If someone makes a mistake, I will often tease them about it.”), and self-defeating humour (e.g. “I let people laugh at me or make fun at my expense more than I should.”). Participants rate the extent to which they agree with different statements about their sense of humour on a 7-point Likert scale (1 = disagree completely, 7 = agree completely). All four scales showed adequate internal consistency in the original study, and Cronbach’s alphas ranged from .77 to .81 (Martin *et al.*, 2003). Humour styles are a multidimensional construct because they consist of four different styles of humour. Each humour style is unidimensional and can be calculated from the sum of all relevant items.

Hedonic Well-being

Positive and negative affect: *the Positive and Negative Affect Schedule* (PANAS; Watson, Clark and Tellegen, 1988) consists of 20 items, 10 for positive affect including “active, alert, attentive, determined, enthusiastic, excited, inspired, interested, proud, and strong”; 10 for negative affect including “afraid, ashamed, distressed, guilty, hostile, irritable, jittery, nervous, scared, and upset”. Participants rated the extent to which they had felt each of the affects at the present moment or over the past week on five levels (1 = Very Slightly or Not at All, 5 = Extremely). PA and NA are two unidimensional constructs, separately.

Life satisfaction: *the Satisfaction with Life Scale* (SWLS; Diener *et al.*, 1985) consists of 5 items. Life satisfaction was assessed as a cognitive-judgmental process by providing an overall judgment of the quality of life. Participants rated the extent to which they agreed with the statement about their life (e.g., “In most ways my life is close to my ideal.”) on seven levels (1 = Strongly disagree, 7 = Strongly agree). SWLS is a unidimensional construct.

Eudaimonic Well-being

The Psychological Well-Being Scales (SPWB; Ryff and Keyes, 1995) consist of 43 items and yield an overall psychological well-being score and dimensions of autonomy (e.g. “In general, I feel I am in charge of the situation in which I live.”), environmental mastery (e.g. “I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people.”), personal growth (e.g. “I live life one day at a time and don’t really think about the future.”), positive relations with others (e.g. “I think it is important to have new experiences that challenge how you think about yourself and the world.”), purpose in life (e.g. “Maintaining close relationships has been difficult and frustrating for me.”), and self-acceptance (e.g. “I tend to worry about what other people think of me.”). Items were rated on a 6-point Likert scale (1 = Strongly disagree, 6 = Strongly agree). The Cronbach’s alphas of each dimension was around 0.49 in the original study (Ryff and Keyes, 1995). SPWB is a multidimensional construct that consists of six different dimensions.

Psychological Distress

Depression: *the Patient Health Questionnaire - 9* (PHQ-9; Spitzer *et al.*, 1999) is a reliable and valid measure of depression severity (Kroenke, Spitzer and Williams, 2001). It consists of 9 items reflecting DSM-IV depression diagnostic criteria. Participants rate how often they have been bothered by the 9 problems (e.g. “Little interest or pleasure in doing things.”) over the last 2 weeks. Items were rated on 4 levels (0 = Not at all, 3 = Nearly every day). The responses are scored from 0 to 27. Cut-off scores are used to indicate depression severity as 0-4: minimal depression, 5-9: mild depression, 10-14: moderate depression, 15-19: moderately severe depression, and 20-27: severe depression. PHQ-9 is a unidimensional construct.

Anxiety: *the Generalized anxiety disorder - 7* (GAD-7; Spitzer *et al.*, 2006) consists of 7 items focusing on symptoms of anxiety. The GAD-7 is a valid and efficient tool for screening for anxiety (Spitzer *et al.*, 2006). Participants rate how often they have been bothered by the 7 problems (e.g. “Feeling nervous, anxious or on edge.”) in the past 2 weeks. Items were rated on 4 levels (0 = Not at all, 3 = Nearly every day). The responses are scored from 0 to 21. Cut-off scores are used to indicate anxiety severity as 0-5: mild anxiety, 6-10: moderate anxiety, 11-15: moderately severe anxiety, and 15-21: severe anxiety. GAD-7 is a unidimensional construct.

For the statistical testing, two sets of analyses were performed. First, group differences among different demographic and background variables were tested using independent sample t-tests and One-way analysis of variance (ANOVA). The independent sample t-test was used to compare the means of two independent samples (groups in the current study). That means it tested whether there were differences in outcome variables between two groups, such as between male and female students, between home and international students, and between single and not single students. One-way ANOVA was used to test the difference between the means of several subgroups of a variable (multiple testing). For instance, whether there were differences among undergraduate, postgraduate taught, and postgraduate research students on the outcome variables can be tested using one-way ANOVA. Group differences provided evidence about the effect of demographic variables on trait EI, humour styles, and psychological well-being. The sampling frame of the qualitative study was also developed based on the results of group differences.

The second set of analyses focused on the associations among outcome variables. This was the primary result of the quantitative study. Pearson's correlation analysis was used to test whether the values of two outcome variables were associated. It determined associations rather than causal directions between two variables. The existence of correlations offered the possibility of building a complex model to describe the relationships between EI, humour, and psychological well-being.

Partial Least Squares Structural Equation Modelling (PLS-SEM) was performed to estimate the indirect effects of trait EI to psychological well-being through the four humour styles. Structural equation modelling (SEM) is a family of statistical techniques that have become increasingly popular in psychology and social sciences. SEM has some advantages over traditional multivariate analyses such as multiple regression, logistic regression, and analysis of variance. First, SEM allows causal chains, such as X leads to M leads to Y, and complex models involving many linear equations to be estimated simultaneously, and provides a summary evaluation for model comparison (Tomarken and Waller, 2005). By contrast, most alternative regression-type methods can only separately estimate these complex models “equation by equation”. Second, SEM allows models involving latent variables to estimate theoretical concepts (Tomarken and Waller, 2005). Regression-based methods can only process observed variables such as age and gender. Third, SEM considers measurement error in analyses (Tomarken and Waller, 2005). The assumption of regression-type methods ignores the effect of measurement error (Haenlein and Kaplan, 2004).

SEM is composed of observed variables, assessed directly using scales (e.g., items of trait EI); and latent variables (or constructs), representing underlying theoretical constructs (e.g., overall trait EI). SEM was distinguished as two types: covariance-based SEM uses the empirical variance-covariance matrix to estimate model parameters; variance-based SEM uses proxies created as linear combinations of observed variables to estimate parameters (Henseler, Hubona and

Ray, 2016, p. 20). PLS-SEM is a variance-based SEM. It can model both factors (reflective model) and composites (formative model). The hypothesis underlying the factor model was “the variance of a set of indicators can be explained by the existence of one unobserved variable (the common factor) and individual random error” (Henseler, Hubona and Ray, 2016, p. 20). The factor model is the standard model used to model latent variables of behavioural research such as attitudes or personality traits (Höök and Löwgren, 2012). The present study, therefore, applied a factor-based PLS-SEM. PLS-SEM is particularly suitable for small sample sizes and non-normal distributed data (Henseler, Hubona and Ray, 2016), and has less restrictions than factor-based SEM. This approach is also suitable for complex and multi-order models (Hair *et al.*, 2016; Hair, Sarstedt and Ringle, 2019). In addition, PLS-SEM performs less parameter estimate biases because it estimates all path coefficients and item loadings while analysing process (Fornell and Larcker, 1981; Sheng and Teo, 2012; Hair *et al.*, 2016). Path coefficients and item loadings are both forms of parameter estimates.

PLS-SEM is usually conceptualised as two sets of linear equations: the measurement model, identifying the relations between a latent variable (construct) and its observed indicators; and the structural model, identifying the relationships between the latent variables (constructs). I applied the two-step procedure according to these two sets. First, the measurement model was examined to estimate the extent to which each construct was represented by its indicators. Second, the structural model was tested to calculate whether the

relationships between the constructs were satisfactory, e.g., that the t-tests showed significance.

Assessing measurement models. There were four steps to assess the reflective measurement model, which followed the guide by Hair and colleagues (2019). See Box 4-2.

Box 4-2 Four steps to assess measurement model (Hair et al., 2019)

- (1) Indicator loadings. They indicate that what percentage of the indicator's variance is explained by the construct.*
- (2) Internal consistency reliability. It is the extent to which each construct was represented by its indicators. There are three indicators: Jöreskog's (1971) composite reliability (CR), higher values generally indicating higher levels of reliability; Cronbach's alpha, similar to CR but producing lower values than CR; Dijkstra and Henseler's (2015) rho_A, lying between Cronbach's alpha and CR, serving as a good representation of a construct's internal consistency reliability if the factor model is correct.*
- (3) Convergent validity. It is the extent to which the construct converges to explain the variance of its items. Average variance extracted (AVE) is the metric used for evaluating a construct's convergent validity for all items on each construct.*
- (4) Discriminant validity. It is the extent to which a construct is empirically distinct from other constructs in the structural model. There are two indicators: Fornell-Larcker Criterion proposed by Fornell and Larcker (1981), suggesting a factor's AVE should be higher than its squared correlations with all other factors in the model. Heterotrait-monotrait ratio (HTMT) proposed by Henseler et al. (2015), is the mean value of the item correlations across constructs relative to the (geometric) mean of the average correlations for the items measuring the same construct.*

Assessing structural models. There were five indicators of assessing the structural model, which followed the guide by Hair and colleagues (2019) and Henseler and colleagues (2016). See Box 4-3.

Box 4-3 Five steps to assess structural model (Hair *et al.*, 2019)

- (1) *Variance inflation factor (VIF). It is the indicator of multicollinearity and common method bias. If indicators' weights have unexpected signs or are insignificant, this can be due to multicollinearity.*
- (2) *Coefficient of determination (R^2). This indicates the percentage of variability accounted for by the precursor constructs in the model. The R^2 is the model's in-sample predictive power (Rigdon, 2012).*
- (3) *Effect size f^2 . For significant path coefficient, suggests magnitude of effects.*
- (4) *Q^2 value. It is the blindfolding-based cross-validated redundancy measure. It is the model's out- of-sample predictive power (Stone, 1974; Geisser, 1975).*
- (5) *Standardized root mean square residual (SRMR). It is defined as the root mean square discrepancy between the observed correlations and the model-implied correlations (Hu and Bentler, 1998). SRMR is the absolute measure of fit.*

The specific criteria (threshold values) of each indicator above are described in more detail in Chapter 6.

Mediation analysis was conducted to investigate the mediating effect of humour in the relationship between EI and psychological well-being. Mediating variables

are important in psychological theory and research. Behavioural, psychological, biological, or social constructs are usually considered as mediating variables that transmit the effect of the independent variable to the dependent variable (MacKinnon, Fairchild and Fritz, 2007). Mediating variables formulate the basis of many psychological theories such that researchers use mediation as a prominent way to explain the process or mechanism by which one construct affects another (MacKinnon, Fairchild and Fritz, 2007). The simplest form of mediation represents the effect of the independent variable X on the dependent variable Y which is mediated by a third variable, M , named the mediator or mediating variable. That is, X causes M , and M causes Y , so $X \rightarrow M \rightarrow Y$. M improves the understanding of the relation between X and Y . Figure 4-2 illustrates the total effect c of the causal relation between independent variable X and dependent variable Y . Figure 4-3 shows that X applies an indirect effect $a \times b$ on Y through mediator M . c' represents the direct effect of X on Y when the mediator M is added to the relation.

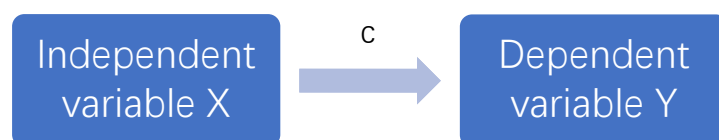


Figure 4-2 Simple causal-effect relationship model.

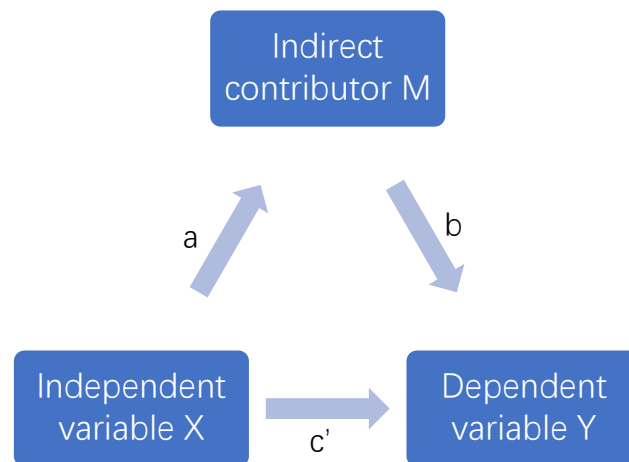


Figure 4-3 General mediation model.

I considered using PROCESS which is a “macro” available for SPSS and SAS, and is commonly used to analyse mediation, moderation, and conditional process analysis with observed variables (Hayes, 2013). PROCESS estimates models with ordinary least squares regression-based path analysis, which has similar limitations of regression-based methods mentioned before. By contrast, PLS-SEM simultaneously estimates complex models with latent variables, and considers the effect of measurement error. In addition, PLS-SEM allows small sample size to estimate complex mediation models, and is suggested a preferred option for conditional process analyses (e.g., mediation, moderation, and moderated mediation; Sarstedt *et al.*, 2020). For these reasons I used PLS-SEM in my analysis.

The mediation effects in the current research were tested on PLS-SEM followed the two-step procedure developed by Nitzl *et al.* (2016):

Step 1: Testing the significance of indirect effects: in order to establish a mediation effect, the indirect effect $a \times b$ must be significant in the first step. Bootstrapping procedure was used to analyse the significance of mediation effects (MacKinnon, Lockwood and Williams, 2004). The bootstrapping procedure is a resampling method using random sampling with replacement to create some subsamples (e.g., 5000) from the initial dataset (Carrión, Nitzl and Roldán, 2017). Hayes and Scharkow (2013) indicated that the bias-corrected bootstrap confidence interval is the most reliable approach for testing mediation effects, such that 95% bias-corrected bootstrap was used to determine the significance of mediating effects in the current study. This is particularly appropriate for non-normal distributed data and provides greater statistical power than other methods (Fritz, Taylor and MacKinnon, 2012; Fang, 2014).

Step 2: Determining the type of effects: the indirect effect $a \times b$ in step 1 is significant indicating that a mediating effect exists. Consequently, there are two types of mediating effects, full and partial mediation. Partial mediation can be distinguished into two sub-types, complementary and competitive partial mediation. A full mediation exists when the indirect effect $a \times b$ is statistically significant whereas the direct effect c' is not significant. This means that the effect of the independent variable X on dependent variable Y is fully transmitted

through the mediator M . For partial mediation, both the indirect effect $a \times b$ and the direct effect c' are significant. In a complementary partial mediation, the indirect effect $a \times b$ and direct effect c' have the same, positive or negative direction (Baron and Kenny, 1986). This suggests that a part of the effect of X on Y is transmitted through M , and X explains a part of Y that is independent of M . In terms of competitive partial mediation, the indirect effect $a \times b$ and direct effect c' have different directions. As mentioned above, M explains a part of the effect of X on Y , but X still explains a part of Y that is independent of M . This suggests that the mediator possibly increases or reduces the magnitude of the relation between the independent and dependent variables. When the indirect effect $a \times b$ is not significant, this means that there is no mediating effect.

The fundamental article on mediation by Baron and Kenny (1986; Kenny, 2023) argued that a mediation model is a causal model, that is, the independent variable causes the mediator, and the mediator causes the dependent variable, not vice versa. However, this has been criticised with others pointing out the bias of mediation analysis using cross-sectional data to explain a longitudinal causal process (e.g., Cole and Maxwell, 2003; Maxwell and Cole, 2007; Maxwell, Cole and Mitchell, 2011; Jose, 2016). Empirical evidence provided by Jose (2016) suggested that single cross-sectional mediations were limited in explaining the causal effects among variables over time. Possible causal interpretations from a mediation study in a cross-sectional design should not be made.

The current quantitative study adopted a cross-sectional mediation model to test the hypothesised mediating effect of humour between EI and psychological well-being. One of the aims was to investigate the levels of well-being and distress of international students, and to obtain their insights into self-managing psychological well-being in a different context. The vast majority of the responding international students were one-year postgraduate taught students. Data were collected at the start of semester 2 teaching, aiming to allow international students to adapt to life and study in Scotland, after about three months of enrolment. All postgraduate taught students are aiming to graduate within one academic year. A longitudinal design usually requires at least three time points to fit a linear trajectory (Raudenbush and Bryk, 2002; Bollen and Curran, 2006), which would make it difficult or impossible to give most international students a third assessment.

However, this cross-sectional quantitative study did not stand alone. As a component of a mixed methods design, the cross-sectional quantitative study combined with a sequential qualitative study, considering situational and unconscious features of humour behaviours in real life, could provide a relatively comprehensive understanding of how university students with diverse EI levels engage in humour in self-managing psychological well-being in daily life. The cross-sectional mediation analysis can test the possible role of humour between EI and psychological well-being, and inform the design of interviews in qualitative component.

4.3.2.2 Phase 2 Qualitative study

In Phase 2, qualitative semi-structured interviews were conducted with students recruited according to criteria identified in the quantitative survey. This was to further address the research questions of the mixed methods study, and to provide supplemental findings to the quantitative component. To recap, the research question related to this phase was:

RQ2-3: what is the role of humour in psychological well-being among university students?

Sampling strategies were considered in the first step. As a part of the mixed method study, the qualitative study adhered to qualitative principles. Participants in qualitative studies are intentionally selected to reflect specific characteristics of a population or groups of persons. There are three main strategies for qualitative sampling: purposive, theoretical, and convenience sampling. For purposive sampling, or criterion-based sampling, participants are selected based on their characteristics which enable nuanced information relating to the questions and a wide-range of perceptions to be explored (Bryman, 2016). The criteria may be socio-demographic characteristics, behaviours, or specific experiences, etc. For theoretical sampling, participants were selected due to the basis of their potential contribution to theory development and testing (Glaser, Strauss and Group, 2017). Theoretical purpose and theoretical relevance are the

key criteria for this approach. The development of grounded theory is generally associated with theoretical sampling. For convenience sampling, participants are selected purely on the basis of who is available. This can bring restrictions to some extent on reaching generalisable conclusions due to the lack of diversity in the sample. Although there are some key differences among the three approaches, they also have considerable overlap, thus many studies use combinations of each approach.

Information power values the information richness of the sample and to what extent it can meet the aims and requirements of the study (Braun and Clarke, 2022, p. 28). In terms of the present study, a more purposive sampling was adopted. In order to gain a wide range of views to help answer the research question, the criteria included sex, student origin (UK/EU and international students), EI score, and score of psychological well-being from the quantitative survey results. The consideration of sample size and details of the sampling frame are introduced in Chapter 7.

Data collection consisted of two parts: method of data collection and design of fieldwork.

Decisions on data collection methods mainly followed the research questions, and were influenced by the context and timing of research. One-to-one semi-structured interviews were adopted as the preferred method of data collection in

the present study. One-to-one interactions offer an opportunity for detailed exploration of each participant's individual perspective and experience, and to gain an in-depth understanding of the personal situation within the target research context. The present research questions involved exploration of individual experiences and personal views thus one-to-one interviews were more desirable than group methods. Within various forms of interviews, semi-structured interviews provided additional advantages for the present study (Yeo *et al.*, 2014, p. 183): firstly, questions are "open" in semi-structured interviews, allowing participants to arrange their own answers; second, they are flexible as they enable clarifying unclear information, and exploring further understanding of the research questions and responses.

The use of a topic guide is an important tool in fieldwork. It provides the direction and form of data collection. Topic guides outline the main issues and sub-topics to be explored with interviewees. The interviews were conducted followed the topic guide (see Appendix 7) with questions about four sub-topics, including life and study in Glasgow, views on psychological well-being and EI, views on problem solving, and views on humour. Each sub-topic included several questions to explore more about the participants' perspectives and behaviours. The interviews were used to provide insight into the results from the quantitative phase and helped explain how participants with a range of EI and mental wellbeing scores performed in real-life settings.

A pilot study was conducted with four participants to refine the topic guide and ensure its suitability for the full study.

Data analysis. A reflexive thematic analysis approach was chosen to analyse the data (Braun and Clarke, 2022). As a method for identifying themes in qualitative data, thematic analysis allows a theoretically flexible approach to data analysis, and is not aligned to any one theoretical framework (Braun and Clarke, 2022). It has become a very widely used tool in psychology, social science, and beyond (Terry *et al.*, 2017). The current study applied a Big Q orientation with a critical realist approach, and access to situated and interpreted realities (Maxwell, 2012; Braun and Clarke, 2022). A primarily semantic data-derived inductive analysis was conducted.

In contrast with a deductive analytical approach, which applies prior theory as an interpretative lens through which to shape coding and theme development, an inductive orientation uses the data as the beginning point of analysis, draws attention on the meaning of the data, and develops themes driven by the data content (Braun and Clarke, 2022). An inductive orientation is more appropriate for addressing research questions about experiences, views, and meanings of participants, which therefore fits the current research aim better. Deductive and inductive orientations are not mutually exclusive, and can be seen as two ends of a continuum (Braun and Clarke, 2022). Semantic coding explores the surface and more explicit meaning of the data, whereas latent coding explores deeper and

more implicit meaning of the data. The semantic and latent codes also locate at two ends of a spectrum, and can be combined in one analysis (Braun and Clarke, 2022).

Subjectivity is a key feature of reflexive thematic analysis, which is viewed as the heart of a qualitative sensibility, and drives the process of analysis (Finlay, 2002; Gough, 2016; Luttrell, 2019). Researcher subjectivity involves their personal identities, values, and background knowledge, which can shape and are part of qualitative analysis. Qualitative research should interrogate and integrate subjectivity. Reflexivity is the most used method to obtain and question research subjectivity, throughout the whole process of qualitative study. Regularly reflecting on the research hypotheses, choices, and actions throughout the analysis process is considered as the term of reflexivity (Finlay and Gough, 2008). Researchers should develop an awareness of their stance on the philosophical and theoretical assumptions, and of their positionings such as gender, age, and socioeconomic status, which may shape the research and engagement with data (Braun and Clarke, 2022). A reflexive journal was developed from the start of the qualitative study, to record my ideas, actions, questions and everything relating to the current study, and to aid the whole process of the study.

The present method involved a six-phase analytic process proposed by Braun and Clarke (2022), including familiarising with the data, generating codes, constructing themes, reviewing potential themes, defining and naming themes,

and producing the report. More details on the analysis process are described in Chapter 7.

In summary, this thesis consists of 3 phases; a systematic review (providing theoretical underpinnings of the link between EI and humour styles), a mixed methods study consisting of a quantitative study (providing statistical evidence on the process between EI and psychological well-being: the mediating role of humour styles) and a qualitative study (exploring the experience and insight into humour in psychological well-being among university students). Figure 4-4 illustrates the project design.

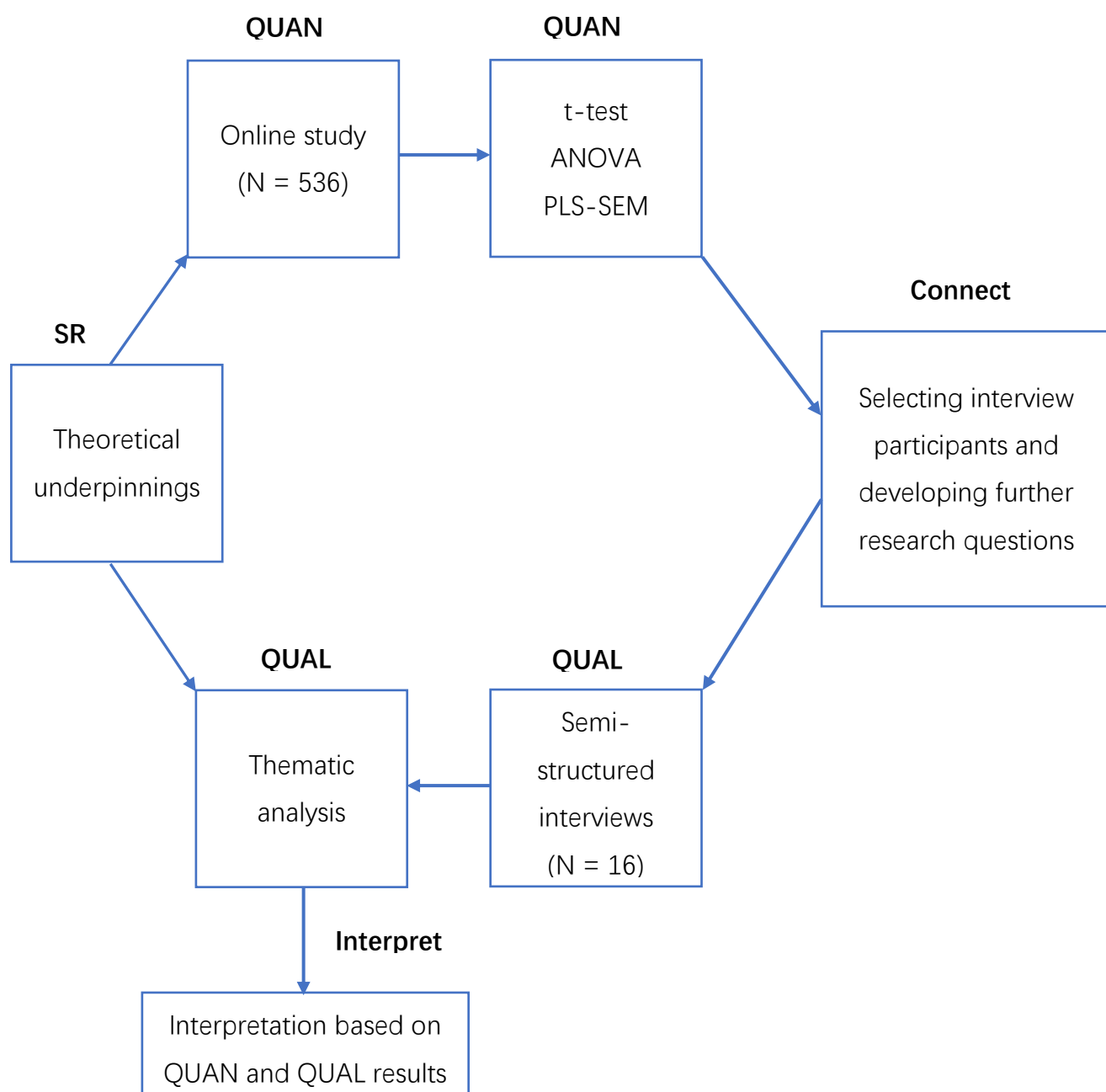


Figure 4-4 PhD research design: systematic review and sequential mixed methods design. SR = systematic review, QUAN = quantitative study, QUAL = qualitative study.

4.4 Ethics and confidentiality

Ethical approval for the survey and interviews was obtained through the MVLS ethics committee (Project No: 200180031) at the University of Glasgow on 5th December 2018 (Appendix 1). Since the participants were all volunteer students, the main ethical considerations for the two studies (survey and interviews) involved informed consent, confidentiality, and data storage. Careful consideration was given to data collection, data storage and presentation of results.

All potential participants were emailed the participant information sheet (Appendix 2) and the consent form (Appendix 3) in advance of the study. Surveys were anonymous. Students returning the surveys were not identifiable unless they consented and then gave their details to be contacted for the subsequent planned interview study. The surveys did not include any information that could identify the participant, it was not possible to know who had replied (unless they supplied contact information), they were assigned a number for analysis and this number was not linked to any identifiable information. Anonymity was also ensured in the process of data analysing and results reporting. Data was stored in password-protected laptops, accessible only to members of the research team. All study data were held in accordance with The General Data Protection Regulation. Any data in paper form were stored in locked cabinets in rooms with restricted access at University of Glasgow. All data in electronic format were stored on secure

password-protected computers. No one outside of the research team or appropriate governance staff would be able to find out participants' name, or any other information which could identify them.

For the interviews, RX discussed the purpose of the study with the proposed participant. The consent form was signed by each participant at the start of each interview after discussing the purpose and providing the opportunity to ask questions prior to the interview. The venue and time of each interview were agreed with both RX and the participant, and confidentiality was assured. Audio recordings were transcribed by RX and transcription specialist (SmallBiz) approved by General Practice and Primary Care, ensuring data confidentiality. The audio recordings will be deleted after the thesis is submitted. Consent forms were kept in locked filing cabinets. Data were stored in password-protected laptops, accessible only to members of the research team.

The application form for ethics approval, participant information, consent forms (for survey and interviews separately), cover letters for recruitment (for survey and interviews separately), questionnaires for survey, and topic guide for interviews can be found in Appendices.

4.5 Chapter summary

This chapter has addressed the principle methodological considerations. Multiple

methods have been adopted, including a systematic review on the relationship between EI and humour styles (Stage 1, in Chapter 5), and a mixed-methods study involving a quantitative study using PLS-SEM & mediation analysis on the mediating role of humour styles between EI and psychological well-being (Stage 2, in Chapter 6), and a qualitative study using semi-structured interviews on the perceptions regarding the role of humour in psychological well-being (Stage 2, in Chapter 7).

Chapter 5 A systematic review of the relationship between emotional intelligence and humour styles

5.1 Overview

This chapter describes the systematic review undertaken to investigate the relationship between EI and humour styles. The Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines (Moher *et al.*, 2009) will be followed to ensure the reliability and transparency of the review. The strengths and limitations will be discussed.

5.2 Background

An increasing number of studies have explored the interaction between EI and humour styles because of interest in how the two constructs interact to be associated with adaptive life outcomes. As discussed in Chapter 3, a relationship between EI and humour styles may be explained by the DET, which considers emotion motivation as a crucial component of EI, and focuses on the adaptive, motivational, and cue-producing characteristics of emotions (Izard *et al.*, 2012). Effective use of emotions could facilitate thought-action patterns and appropriate responses in order to achieve better life outcomes (Zeidner, Matthews and Roberts, 2012). These EI - humour styles associations may also be due to the close

relationship between EI and empathy. For example, individuals engaging in affiliative humour are more able to perceive the emotional information of others (affective empathy) in order to amuse others and facilitate relationships. Those who are clearly aware of others' emotions know what the appropriate way is, and when is the proper timing, to say funny things (Vernon *et al.*, 2009). In addition, the pathway connecting EI and humour styles might be explained by the broaden-and-build theory of positive emotions, which hypothesises that positive emotions broaden individuals' short-term perception, thoughts and actions, and build long-term personal resources (Fredrickson, 1998, 2001). The positive associations between EI and emotional well-being indicates better EI may be associated with more positive emotions which result in more flexible and prosocial response tendencies (Fredrickson, 1998) such as some adaptive humour behaviours.

However, I have been unable to find any study that has systematically investigated the relationship between EI and humour styles to date. More attention should be drawn to this neglected relationship, especially to the relationship between each EI sub-factor and each humour style because certain humour behaviour may be related to particular emotional competence. Systematically reviewing the literature in this field can enhance the understanding of different models (i.e., ability and trait) and sub-factors of EI, and their diverse relationships with each humour style. In addition, although trait EI theoretically may have closer associations with humour styles than ability EI, little systematic evidence supports this hypothesis.

A systematic review of the relationship between EI and humour styles was conducted as the first study in the thesis, to provide a fuller picture of this relationship, test the hypothesis of trait EI having closer associations with humour styles than ability EI, and to identify potential gaps in the literature. The aim of the review was to understand from the current literature what we know about the relationship between EI and humour styles. Findings of the systematic review can inform the following empirical study and which EI model (i.e., trait EI or ability EI) would be more appropriately studied and which EI measure should be used in this thesis. The review may also improve our understanding of what contributes to psychological well-being, such that beneficial psychological interventions aimed at enhancing desirable life outcomes could be developed. Further, understanding of the relationship between EI components and humour styles might improve psychological research on emotion, personality, and behaviour. The research questions of this study were:

- (1) What has been found in previous studies about the relationship between ability/trait EI and humour styles among adults in non-clinical settings?

- (2) How do previous studies explain the relationship between ability/trait EI and humour styles among adults in non-clinical settings?

The Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines (Moher *et al.*, 2009) were followed to ensure the reliability and

transparency of the review.

5.3 Method

5.3.1 Search Strategy

A search of the electronic databases MEDLINE, PsycINFO, Web of Science, PubMed and Psychology and Behavioural Sciences Collection was conducted. Keywords contained combinations of the following expressions: *emotional intelligence, emotional competence, emotional self-efficacy, humour, humour styles, humour styles questionnaire, HSQ, wit and humour, joke, and cartoons*. The Boolean operators (OR, AND) and truncations were used. Full search strategy can be found in Appendix 8.

Searches were not limited for start date and ended in July 2022. These were supplemented by hand-searching reference lists of eligible studies and forward citation searches of included studies using Web of Science. No language restrictions were applied to the search, but only English language articles were included at the screening level. The process of developing the search strategy for this review was done in collaboration with the subject librarian at the University of Glasgow.

5.3.2 Eligibility Criteria

5.3.2.1 Study characteristics

Studies were included if they met all of the following criteria: (1) Empirical studies that provided precise statistical tests of the correlation between EI and humour styles. (2) Studies that used adult and non-clinical participants. (3) Studies that used variables specifically referred to as humour styles or EI, excluding studies that used other although relevant variables (e.g., coping humour, social intelligence). (4) Studies that used a psychometrically sound measure of at least one EI component. (5) Studies that used at least one of the four humour styles measured with the HSQ (Martin *et al.*, 2003). (6) Studies published in peer reviewed journals.

5.3.2.2 Reported characteristics

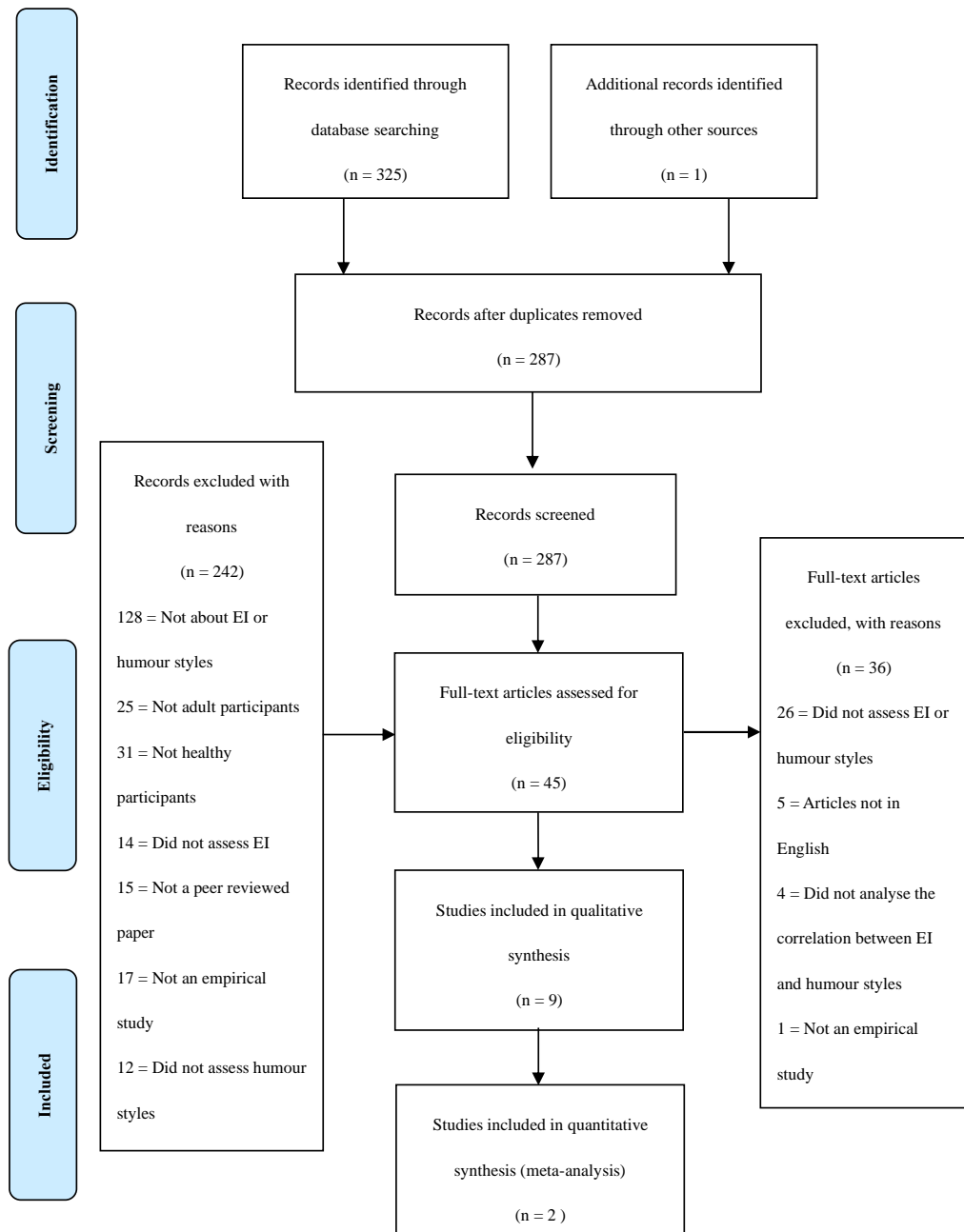
There were no restrictions on participant demographics such as age, gender, socioeconomic status and year of publication.

5.3.3 Study Selection

There were four steps for the review strategy: (1) studies were identified through searching the five target databases; (2) duplicated studies were excluded using EndNote according to the titles and authors; (3) abstracts were screened by two authors (RX and JM) in order to carefully select articles that met the inclusion

criteria; (4) full articles were assessed by the same two authors for eligibility. The four-step process is illustrated in the PRISMA flow diagram (Figure 5-1). Nine full articles were included for full review analysis.

Figure 5-1 PRISMA flow diagram showing the process of study selection.



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for

Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7)

5.3.4 Data Extraction

Nine papers covering ten studies were included in the review. The following information was double extracted by authors (RX and JM): general information, study characteristics, participant characteristics, outcome data, additional outcomes, results, reported strengths and limitations, reported conclusions, and funding. Results of data extraction were reviewed by AEW. Studies are reported in the results as classified into two main categories based on different EI measures used: (1) studies measured EI by performance test (ability EI); (2) studies measured EI by self-report tests (trait EI).

5.3.5 Quality Appraisal

The Appraisal tool for Cross-Sectional Studies (Downes *et al.*, 2016) was adopted for quality rating in this review. There are 20 indicators for quantitative studies involving the study objective, study design and rationale, sample size and characteristics, reporting of results, discussion and other indicators such as funding and ethical approval. I supplied two additional indicators to rate the theoretical basis and the response rate for the study. One of the two indicators is “*was the theoretical basis adequately explained*”, because the original tool only evaluates the aims/objectives in the section of introduction. The other additional indicator is “*could there be confounding factors that have been accounted for*”. Since trait EI and humour were both affected by personality characteristics

(Andrei *et al.*, 2016; Martin *et al.*, 2003), specific confounding factors would be paid attention in the current review. Moreover, the AXIS tool only assesses general limitations in its original version. Therefore, the overall quality score was computed for each study using the 22 indicators. Answers were scored 0, 1, 2 for 'No', 'Don't know' and 'Yes', respectively. N/A if not applicable to the study. Total scores varied between 0 and 44 or between 0 and 42 (involving N/A): (1) 1-11 (lower 25%) = Low; 12-32 = Moderate and 33-44 (upper 75%) = High; (2) 1-10.5 (lower 25%) = Low; 11.5-30.5 = Moderate and 31.5-42 (upper 75%) = High. Two of the authors (RX and JM) completed the quality ratings independently and then met to discuss their ratings with AEW and CW, to agree on final scores. Discrepancies were solved by discussing the papers in question and agreed scores were recorded based on the opinions of four authors.

5.3.6 Qualitative synthesis

Qualitative synthesis is a replicable, rigorous, and transparent method, which was adopted in the current systematic review (Siddaway, Wood and Hedges, 2019). Since the existing useful research are all quantitative studies, a narrative review was conducted. Narrative reviews synthesize the findings of individual quantitative studies using diverse methods, and linking together these studies for interconnection to establish a new theory or evaluate existing theories, in order to advance the knowledge in a field (Siddaway, Wood and Hedges, 2019).

5.3.7 Quantitative synthesis

A comprehensive meta-analysis was not conducted due to the paucity of studies that used ability EI and trait EI measurements except for TEIQue. Effect sizes were calculated with the information from two papers which represented three studies using TEIQue. Qualitative synthesis was reported with effect size calculations of mean correlations between EI measured by TEIQue and humour styles.

(1) Effect size calculation

With a view to providing a measure of the relationship between trait EI and humour styles, effect sizes were calculated with the information from the two papers in which trait EI was measured using TEIQue. The aim was to calculate the estimated correlation (r) and to observe the relationships between trait EI and humour styles; and to analyse the specific associations of each trait EI facet and humour style.

(2) Statistical analysis

I combined three sets of data from two included papers (one representing two studies) which used the same EI measurement (TEIQue). To undertake the meta-analysis, I used the procedure proposed by Borenstein, Hedges, Higgins, and Rothstein (2021). A random-effects model was adopted because all 3 included

studies differed in the characteristics of participants. The effect size index used was the Pearson correlation coefficient (r). Effect sizes ≤ 0.30 , between 0.31 and 0.66, and ≥ 0.67 are considered as small, moderate and large, respectively (Lipsey and Wilson, 2001). Heterogeneity was measured by the Cochran's Q (Cochran, 1954). I tested the null hypothesis that all studies evaluated the common effect. Q followed a central chi-squared distribution under the null hypothesis. A p -value was reported as < 0.05 indicating a statistically significant Q value indicating that all studies did not evaluate the same effect. Heterogeneity was measured according to Higgins and colleagues (2003) by using I^2 to assess the real percentage of the observed variance (inconsistency) across the studies. The possible values of I^2 ranged from 0% to 100%. Some proposed cut-off points are suggested. The I^2 values around 25%, 50% and 75% are considered as low, moderate and high heterogeneity, respectively (Higgins *et al.*, 2003). Data analysis was conducted using SPSS version 23.0.

(3) Procedure

Estimation of the effect sizes and assessment of heterogeneity were obtained according to the procedure suggested by Borenstein *et al.* (2021) in Box 5-1.

Box 5-1 Estimation of effect sizes and assessment of heterogeneity according to Borenstein *et al.* (2021).

(1) Converting the correlation r to the Fisher's z scale.

$$z = 0.5 \times \ln\left(\frac{1+r}{1-r}\right)$$

(2) Computing the within variance, between variance and variance total.

(3) Computing weighted mean M for random-effect model.

(4) Computing the variance of summary effect, the estimated standard error of the summary effect and the 95% lower and upper limits for the summary effect.

(5) Computing the Z -value to test the null hypothesis.

$$Z = \frac{M}{SE_M}$$

(6) Converting the summary values Z back to correlation \bar{r}

$$\bar{r} = \frac{e^{2z} - 1}{e^{2z} + 1}$$

(7) Computing Cochran's Q , I^2 and the 95% lower and upper limits for I^2

$$I^2 = \left(\frac{Q - df}{Q}\right) \times 100\%$$

5.4 Results

5.4.1 Summary

A total of 326 articles were initially identified from the five databases. The articles were screened and 287 were retained after 39 duplicated articles were removed. These retained articles were screened by abstract and 45 progressed to full-text screening after 242 ineligible articles were removed. Of those articles, 36 articles were removed by full-text screening for the following reasons (1) did not assess EI or humour styles (2) articles not in English (3) did not analyse the correlation between EI and humour styles (4) not an empirical study. Finally, nine articles were included in the qualitative synthesis, and two articles were included in the quantitative synthesis. Table 5-1 summarizes the articles.

Table 5-1 Characteristics of studies included in the systematic review.

Author , year	Setting	Age	Gender	N	Measures	Results	Quality score	Appraisal level	
(Ability EI)									
Yip & Martin , (2006)	University of Western Ontario, Canada	From 18 to 24 years (M = 18.8, SD = 0.95)	45 males, 66 females.	111	Humour Styles Questionnair e (HSQ); Mayer - Salovey - Caruso Emotional Intelligence Test (MSCEIT).	Emotional perception significantly & negatively correlated with aggressive humour (r = -0.20, p < 0.05) & self-defeating humour (r = -0.28, p < 0.01). Emotional management significantly & positively correlated with self-enhancing humour (r = 0.24, p < 0.05).	29/44	Moderate	
(Trait EI)									
Greve n et al. (2008)	University College London, the University of Bamberg, UK	From 17 to 48 years (M = 24.15, SD = 6.29)	300 males, 738 females	1038	Humour Styles Questionnair e (HSQ); Trait Emotional	Global TEI significantly & positively correlated with affiliative humour (r = 0.41, p < 0.001) & self-enhancing humour (r = 0.48, p < 0.001). Global TEI significantly & negatively correlated with aggressive humour (r = -	Self-control significantly and negatively correlated with aggressive humour (r = -0.22, p < 0.001), not self-defeating humour (r = -0.28, p > 0.05). Emotionality significantly and positively correlated with affiliative humour (r =	32/42	High

Intelligence Questionnaire (TEIQue). Well-being significantly & positively correlated with affiliative humour (r = 0.36, p < 0.001) & self-enhancing humour (r = 0.49, p < 0.001). Well-being significantly & negatively correlated with self-defeating humour (r = -0.33, p < 0.001), not aggressive humour (r = -0.08, p > 0.05). Self-control significantly & positively correlated with affiliative humour (r = 0.10, p < 0.004) & self-enhancing humour (r = 0.34, p < 0.001).

0.18, p < 0.001) & self-defeating humour (r = -0.35, p < 0.001). Well-being significantly & positively correlated with affiliative humour (r = 0.36, p < 0.001) & self-enhancing humour (r = 0.49, p < 0.001). Well-being significantly & negatively correlated with self-defeating humour (r = -0.33, p < 0.001), not aggressive humour (r = -0.08, p > 0.05). Self-control significantly & positively correlated with affiliative humour (r = 0.10, p < 0.004) & self-enhancing humour (r = 0.34, p < 0.001).

0.33, p < 0.001) & self-enhancing humour (r = 0.31, p < 0.001). Emotionality significantly and negatively correlated with aggressive humour (r = -0.28, p < 0.001) & self-defeating humour (r = -0.25, p < 0.001). Sociability significantly and positively correlated with affiliative humour (r = 0.45, p < 0.001) & self-enhancing humour (r = 0.28, p < 0.001). Sociability significantly and negatively correlated with self-defeating humour (r = -0.22, p < 0.001), not aggressive humour (r = -0.08, p > 0.05).

Vernon et al. (2009)	The 2006 Twinsburg, Ohio, Twins Day Festival. Canada and USA	From 18 to 72 years (M = 41.4, SD = 10.2)	Monozygotic twins: 140 males, 448 females. 912 Dizygotic twins: 146 males, 178 females.	Humour Styles Questionnaire (HSQ); Trait Emotional Intelligence Questionnaire (TEIQue).	Global TEI significantly & positively correlated with affiliative humour (r = 0.30, p < 0.004) & self-enhancing humour (r = 0.45, p < 0.004). Global TEI significantly & negatively correlated with aggressive humour (r = -0.20, p < 0.004) & self-defeating humour (r = -0.20, p < 0.004). Well-being significantly & positively	Self-control significantly & negatively correlated with aggressive humour (r = -0.27, p < 0.004), not self-defeating humour (r = -0.24, p > 0.05). Emotionality significantly & positively correlated with affiliative humour (r = 0.32, p < 0.004) & self-enhancing humour (r = 0.32, p < 0.004). Emotionality significantly & negatively	34/44	High
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correlated with affiliative humour ($r = 0.25, p < 0.004$) & self-enhancing humour ($r = 0.47, p < 0.004$). Well-being significantly & negatively correlated with self-defeating humour ($r = -0.20, p < 0.004$) & aggressive humour ($r = -0.13, p < 0.004$). Self-control significantly & positively correlated with self-enhancing humour ($r = 0.27, p < 0.004$), not affiliative humour ($r = 0.01, p > 0.05$).

correlated with aggressive humour ($r = 0.23, p < 0.004$) & self-defeating humour ($r = -0.13, p < 0.004$). Sociability significantly & positively correlated with affiliative humour ($r = 0.40, p < 0.004$) & self-enhancing humour ($r = 0.34, p < 0.004$). Sociability not correlated with self-defeating humour ($r = -0.07, p > 0.05$) & aggressive humour ($r = 0.08, p > 0.05$).

Global TEI significantly & positively correlated with affiliative humour ($r = 0.38, p < 0.004$) & self-enhancing humour ($r = 0.45, p < 0.004$). Global TEI significantly & negatively correlated with aggressive humour ($r = 0.14, p < 0.004$) & self-defeating humour ($r = -0.23, p < 0.004$). Well-being significantly & positively correlated with affiliative humour ($r = 0.32, p < 0.004$) & self-enhancing humour ($r = 0.45, p < 0.004$). Self-control significantly & negatively correlated with aggressive humour ($r = 0.14, p < 0.004$), not self-defeating humour ($r = -0.27, p > 0.05$). Emotionality significantly & positively correlated with affiliative humour ($r = 0.34, p < 0.004$) & self-enhancing humour ($r = 0.28, p < 0.004$). Emotionality significantly & negatively correlated with aggressive humour ($r = 0.20, p < 0.004$) & self-defeating humour ($r = -0.14, p < 0.004$).

Vernon et al. (2009) - Study 2

The Twin Research and Genetic Epidemiology Unit at St Thomas' Hospital, Canada and UK

Monozygotic twins: 212 males, 1934 females. Dizygotic twins: 120 males, 1670 females.

3936

From 17 to 90 years (M = 56.1, SD = 13.2)

Humour Styles Questionnaire (HSQ); Trait Emotional Intelligence Questionnaire-short form (TEIQue-SF).

34/44 High

Well-being significantly & negatively correlated with self-defeating humour ($r = -0.14, p < 0.004$) & aggressive humour ($r = -0.06, p < 0.004$).
 Sociability significantly & positively correlated with affiliative humour ($r = 0.39, p < 0.004$) & self-enhancing humour ($r = 0.31, p < 0.004$).
 Self-control significantly & positively correlated with affiliative humour ($r = 0.17, p > 0.05$) & self-enhancing humour ($r = 0.36, p < 0.004$).
 Sociability not correlated with self-defeating humour ($r = -0.23, p < 0.004$), not aggressive humour ($r = 0.02, p > 0.05$).

Emotion expression significantly & positively correlated with affiliative humour ($r = 0.30, p < 0.05$) & self-enhancing humour ($r = 0.38, p < 0.05$).
 Emotional self-management was significantly and positively correlated with affiliative humour ($r = 0.24, p < 0.05$) and self-enhancing humour ($r = 0.44, p < 0.05$).
 Emotion expression significantly & negatively correlated with aggressive humour ($r = -0.26, p < 0.05$) & self-defeating humour ($r = -0.25, p < 0.05$).
 Emotional self-management was significantly and negatively correlated with aggressive humour ($r = -0.23, p < 0.05$) and self-defeating humour ($r = -0.30, p < 0.05$).
 Emotional awareness of others significantly & positively correlated with affiliative humour ($r = 0.36, p < 0.05$) & self-enhancing humour ($r = 0.23, p < 0.05$).
 Emotional self-control was significantly and positively correlated with affiliative humour ($r = 0.12, p < 0.05$) and self-enhancing humour ($r = 0.25, p < 0.05$).
 Emotional awareness of others significantly & negatively correlated with Emotional self-control was significantly

Gignac et al. (2014)
 University of Western Australia, Australia
 From 17 to 64 years ($M = 23.85, SD = 9.07$)
 108 males, 201 females
 309

Humour Styles Questionnaire (HSQ); Genos EI.

33/42 High

						aggressive humour (r = -0.16, p < 0.05) & self-defeating humour (r = -0.14, p < 0.05).	and negatively correlated with aggressive humour (r = -0.24, p < 0.05) and self-defeating humour (r = -0.22, p < 0.05).		
Li et al. (2018)	Southwest University, China	Group 1: M = 20.05, SD = 1.44 Group 2: M = 19.93, SD = 1.29	129 males, 150 females	279	Humour Styles Questionnaire (HSQ); Emotional Intelligence Scale (EIS).	In a moderation model, high appraisal of the emotion of other was significantly and positively correlated with self-enhancing humour (β = 0.23, SE = 0.11, 95% CI = [0.02, 0.44], t = 2.16, p < 0.05).		33/42	High
Wang et al. (2019)	Beijing Normal University and three Universities in Henan, China.	From 17 to 26 years (M = 21.16, SD = 1.51)	225 males, 237 females	462	Humour Styles Questionnaire (HSQ); Emotional Intelligence Scale (EIS).	Emotional intelligence significantly & positively correlated with affiliative humour (r = 0.33, p < 0.001) & self-enhancing humour (r = 0.38, p < 0.001). Emotional intelligence significantly & negatively correlated with aggressive humour (r = -0.20, p < 0.001) & self-defeating humour (r = -0.09, p < 0.05). Appraisal of emotions significantly & positively correlated with affiliative humour (r = 0.18, p < 0.001) & self-enhancing humour (r = 0.23, p < 0.001).	Utilization of emotions significantly & positively correlated with affiliative humour (r = 0.33, p < 0.001) & self-enhancing humour (r = 0.33, p < 0.001). Utilization of emotions significantly & negatively correlated with aggressive humour (r = -0.21, p < 0.001) & self-defeating humour (r = -0.10, p < 0.05). Regulation of emotions significantly & positively correlated with affiliative humour (r = 0.33, p < 0.001) & self-enhancing humour (r = 0.39, p < 0.001).	33/42	High

Appraisal of emotions not correlated with aggressive humour ($r = -0.06, p > 0.05$) & self-defeating humour ($r = -0.01, p > 0.05$).

Regulation of emotions significantly & negatively correlated with aggressive humour ($r = -0.24, p < 0.001$) & self-defeating humour ($r = -0.11, p < 0.05$).

Huang et al. (2019)	Chinese University students, China	From 19 to 28 years ($M = 21.39, SD = 2.39$)	92 males, 168 females	260	Humour Styles Questionnaire (HSQ); Emotional Intelligence Scale (EIS).	Overall EI significantly & positively correlated with affiliative humour ($r = 0.34, p < 0.001$) & self-enhancing humour ($r = 0.50, p < 0.001$).	Overall EI significantly & negatively correlated with aggressive humour ($r = -0.41, p < 0.001$) & self-defeating humour ($r = -0.13, p < 0.05$).	29/44	Moderate
Karahan et al. (2019)	Trainee teachers in Ondokuz Mayıs University	$M = 24.5, SD = 1.2$	640 males, 816 females	1456	Humour Styles Questionnaire (HSQ); Modified Schutte EI Scale (Austin et al. 2004).	Overall EI significantly & positively correlated with affiliative humour ($r = 0.29, p < 0.001$) & self-enhancing humour ($r = 0.26, p < 0.001$).	Utilization of emotions significantly & positively correlated with affiliative humour ($r = 0.50, p < 0.001$) & self-enhancing humour ($r = 0.40, p < 0.001$).	35/44	High
						Overall EI significantly & negatively correlated with aggressive humour ($r = -0.29, p < 0.001$) & self-defeating humour ($r = -0.27, p < 0.001$).	Utilization of emotions significantly & negatively correlated with aggressive humour ($r = -0.23, p < 0.001$) & self-defeating humour ($r = -0.31, p < 0.001$).		
						Appraisal of emotions significantly & positively correlated with affiliative humour ($r = 0.37, p < 0.001$) & self-enhancing humour ($r = 0.49, p < 0.001$).	Optimism/mood regulation significantly & positively correlated with affiliative humour ($r = 0.25, p < 0.001$) & self-enhancing humour ($r = 0.59, p < 0.001$).		

Appraisal of emotions not correlated with aggressive humour ($r = -0.21, p < 0.001$) & self-defeating humour ($r = -0.29, p < 0.001$). Optimism/mood regulation significantly & negatively correlated with aggressive humour ($r = -0.26, p < 0.001$) & self-defeating humour ($r = -0.29, p < 0.001$).

	College	Students	Age	Gender	Sample Size	Questionnaire	Findings	Significance	Effect Size
Ogurlu (2015)	Kocaeli University	students in	From 18 to 24	114 males, 205 females	319	Humour Styles Questionnaire (HSQ); Modified Schutte EI Scale (Austin et al. 2004).	Overall EI significantly & positively correlated with affiliative humour ($r = 0.43, p < 0.01$) & self-enhancing humour ($r = 0.48, p < 0.01$).	Overall EI not correlated with aggressive humour ($r = -0.10, p > 0.05$) & self-defeating humour ($r = 0.04, p > 0.05$).	28/44 Moderate

The nine articles studied a combined total of 9089 participants, including 2271 men and 6811 women. In total, 4848 was the largest study sample and 111 was the smallest. Within the nine studies, the age of participants ranged from 17 to 90 years old. Two studies reported ethnicity, one was Chinese and the other was mainly white (41% white-UK; 33.2% white-other than UK). All studies are cross-sectional studies, seven of them used samples of university students, one of them used trainee teachers, one of them recruited twins from USA, UK and Canada.

5.4.2 Quality appraisal

The overall quality appraisal levels in this review ranged from moderate to high across studies. A few studies received a moderate rating because the report was brief and did not include sufficient information about recruitment and other methods used (Yip and Martin, 2006). Common problems involving sampling were found. First, convenience sampling was carried out in all articles, which potentially generated non-representative or biased samples. For example, most studies recruited samples from a class e.g., at a university psychology lecture. Participants may have had more of an understanding of the research topic than the general population, which could have influenced their responses to the questionnaires. Also, university-aged participants are not representative of the general population. Second, only one article reported sample size justification. Finally, all articles adopted a correlational design

which may lead to the “confounding variable” problem when ascribing a direct correlation. In addition, all articles adopted questionnaires to measure the target constructs. The validity of the questionnaires should therefore be taken into account. Caution should therefore be used when drawing conclusions despite the high-quality appraisal scores obtained by these studies.

5.4.3 Summary of EI instruments included

Six EI instruments were used within the nine papers, five of them were self-report tests and one was a performance-based test. The Emotional Intelligence Scale (Schutte *et al.*, 1998), including translated and modified versions, was the most widely used measurement; used 5 times. Table 5-2 illustrates the summary of each EI instrument.

Table 5-2 Summary of EI measures used.

Measures	Authors & Year	Approach	Branches/Factors/Dimensions	Description	Reliability - Internal Consistency
Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT)	Mayer et al., 2002	Maximal performance task	(1) Emotional perception, (2) emotional facilitation of thought, (3) emotional understanding, (4) emotional management.	The MSCEIT consists of 141 items and yields a total ability EI score and scores of four branches. The MSCEIT provides general consensus and expert consensus scoring methods.	Cronbach's alpha coefficients for the general consensus scoring method (authors recommend for most samples) were .93 for total EI, .91 for emotional perception, .79 for emotional facilitation of thought, .80 for emotional understanding and .83 for emotional management (Mayer, Salovey and Caruso, 2002).

Trait Emotional Intelligence Questionnaire (TEIQue)	Petrides & Furnham, 2003	Self-report test using a 7-point Likert scale	(1) Emotionality, (2) Self-Control, (3) Sociability, (4) Well-Being.	The TEIQue consists of 153 items and yields scores of 15 facets including adaptability, assertiveness, emotion expression, emotion management, emotion perception, emotion regulation, low impulsiveness, relationships, stress management, self-esteem, self-motivation, social awareness, trait empathy, trait happiness, and trait optimism.	Cronbach's alpha coefficients for global trait EI were .89 for females and .92 for males; for females, alpha coefficients were .75 for Emotionality, .78 for Self-Control, .79 for Sociability, and .83 for Well-Being; for males, alpha coefficients were .80 for Emotionality, .78 for Self-Control, .82 for Sociability, and .84 for Well-Being (Petrides, 2009).
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A global trait EI and four factors were composed based on the 15 facets.

Trait Emotional Intelligence Questionnaire short form (TEIQue-SF)	Petrides & Furnham, 2003	Self-report test using a 7-point Likert scale	(1) Emotionality, (2) Self-Control, (3) Sociability, (4) Well-Being.	The TEIQue-SF consists of 30 items and yields a global trait EI score and scores of four factors. This form includes two items from each of the 15 facets of the TEIQue.	Cronbach's alpha coefficients for global trait EI were around .69 (Petrides, 2009).
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Emotional Intelligence Scale (EIS)	Schutte et al., 1998	Self-report test using a 5-point Likert scale	(1) Appraisal of Emotion (in the self and others), (2) Expression of Emotion, (3) Regulation of Emotion (in the self and others), and (4) Utilization of Emotion (in	The EIS consists of 33 items. It was designed to assess EI as a single construct, however, some researchers argued that EIS was	The Cronbach's alpha coefficients ranged from .76 to .95, with the majority ranged from .80 to .90 (Schutte, Malouff and Bhullar,
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solving problems).

better represented by four factors.

2009).

Modified Schutte EI Scale	Austin et al., 2004	Self-report test using a 5-point Likert scale	(1) Optimism/Mood Regulation, (2) Utilisation of Emotions, and (3) Appraisal of Emotions	The modified EIS consists of 41 items and yields an overall EI score and three factors. The internal reliability of overall EI was similar to the original EIS but the Utilisation of Emotions factor was improved.	The Cronbach's alpha coefficient for overall EI was .85, for three factors were ranging from .68 to .78 (Austin <i>et al.</i> , 2004).
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Genos Emotional Intelligence Inventory (Genos EI)	Gignac, 2010	Self-report test using a 5- point Likert scale	(1) Emotional Self-Awareness, (2) Emotional Expression*, (3) Emotional Awareness of Others*, (4) Emotional Reasoning, (5) Emotional Self- Management*, (6) Emotional Management of Others, and (7) Emotional Self- Control*. (*used in the included study)	The Genos EI consists of 70 items and yields a Total EI score and scores of 7 dimensions.	The mean Cronbach's alpha coefficient for Total EI was .96, for seven dimensions were ranging from .71 to .85 (Palmer <i>et al.</i> , 2009).
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5.4.4 Ability EI and humour styles

One study adopted MSCEIT to investigate the relationship between EI and humour styles (Yip and Martin, 2006). A total of 111 undergraduate students (45 men and 66 women) participated in this study. Their ages ranged from 18 to 24 years ($M = 18.8$, $SD = 0.95$). Gender differences were found in both ability EI and humour styles. Men scored significantly higher than women on aggressive humour whereas they scored lower on total EI and all branches of EI except Emotional Perception. Due to these gender differences, researchers used partial correlations. Three pairs of correlations between humour styles and ability EI were obtained. Self-enhancing humour was positively related to Emotional Management. Aggressive and self-defeating humour were negatively related to Emotional Perception.

However, this study (Yip and Martin, 2006) was limited by the small sample size ($N = 111$) and restricted demographics of the participants, that is, the participants were all undergraduate university students enrolled in an identical course in North America. The similar knowledge and cultural backgrounds of participants may limit the generalisability of the findings. For example, previous studies demonstrated that cultural (Eastern vs. Western) differences influenced the relationship between humour styles and psychological well-being (Schneider, Voracek, and Tran, 2018), suggesting the link between humour and ability EI may

vary in different cultures. The cross-sectional nature of the design also limited the inference of the direction of causality in the relationship. Self-report measures were used for all variables, which may lead to biases due to shared method variance. In addition, discussions on the potential influence of the developmental period of undergraduate students, emerging adulthood, were neglected. For instance, younger adults were found to score significantly higher on affiliative and aggressive humour than older adults (Martin *et al.*, 2003), suggesting these two humour styles may have different relationships with ability EI across different life stages. Although the MSCEIT is the most widely used ability EI measure (Austin, 2018), a meta-analytic study suggested that the “perceiving emotions” branch and the “facilitating emotions” branch are not distinguishable (Fan *et al.*, 2010). A three-factor model, including “perceiving emotions”, “understanding emotions” and “managing emotions”, has increasingly reached consensus as being the best fit model in the area of ability EI research (Austin, 2018).

5.4.5 Trait EI and humour styles

Eight articles used self-report EI measurements to achieve their aims. A total of 8978 participants (2226 men and 6745 women) were recruited. Ages ranged from 17 to 90 years. Gender differences were investigated in two studies. Men scored higher than women in aggressive humour and self-defeating humour (Ogurlu, 2015; Wang *et al.*, 2019) whereas they scored lower than females on overall EI and all

subscales (Ogurlu, 2015). Within the eight articles, five reported associations between overall and subscales of EI and humour styles, one investigated the relationship between self-enhancing humour and Appraisal of Emotions (Li *et al.*, 2018), and two reported the correlations between overall EI and humour styles (Huang and Lee, 2019).

Five studies adopted the EIS (Karahan *et al.*, 2019; Huang and Lee, 2019; Li *et al.*, 2018; Ogurlu, 2015; Wang *et al.*, 2019), including modified and translated versions (Austin *et al.*, 2004; Huang *et al.*, 2008; Chen, 2008). Adaptive humour styles were found to be positively associated with three components and overall EI. Maladaptive humour styles were negatively associated in some studies with EI. Karahan *et al.* (2019) obtained all negative correlations between maladaptive humour and components/overall EI. However, Wang *et al.* (2019) reported negative correlations between maladaptive humour and Utilization of Emotions, Regulation of Emotions and overall EI; no correlation was found between Appraisal of Emotions and maladaptive humour. In addition, Ogurlu (2015) found no correlation between maladaptive humour and EI.

However, limitations were identified in the five studies (Karahan *et al.*, 2019; Huang and Lee, 2019; Li *et al.*, 2018; Ogurlu, 2015; Wang *et al.*, 2019). First, convenience samples from universities were applied to all studies. Four studies used relatively small samples ranging from 260 to 462 students (Huang and Lee, 2019; Li *et al.*, 2018; Ogurlu, 2015; Wang *et al.*, 2019). Only one study recruited

a large sample ($N = 1456$; Karahan *et al.*, 2019). The generalizability of the findings to other age and socioeconomic groups should be made with caution. Second, the psychometric property of the EIS and its modified version was criticized. It was argued that the EIS was a single-construct measure (Schutte *et al.*, 1998) and the factor structure was unstable (Pérez, Petrides, and Furnham, 2005). EIS was also found to capture general self-efficacy (Joseph *et al.*, 2015) and have moderate to large correlations with some personality traits (Joseph *et al.*, 2015; Brackett and Mayer, 2003). This suggests that the four dimensions of EIS may not be able to exactly separate the proposed four EI components, that is, Appraisal of Emotion, Expression of Emotion, Regulation of Emotion, and Utilization of Emotion. Similarly, cognitive empathy and affective empathy as key components of trait EI are probably not separated by EIS. In addition, the same limitations that apply to the study of ability EI and humour styles apply here, namely, the lack of longitudinal design, biases due to using self-report measures, and lack of discussion on the particular developmental period of the participants.

One study tested the correlation between the general version of Genos EI and humour styles (Gignac *et al.*, 2014). The four subscales most likely to be linked to humour were adopted: emotional awareness of others, emotional expression, emotional self-management, and emotional self-control. All four subscales were found to be associated positively with adaptive humour styles and negatively with maladaptive humour styles.

The same limitations identified previously apply to this study (Gignac *et al.*, 2014), including the small sample size (N = 309), the lack of longitudinal data, and convenience sampling from university students in a Western country. Another limitation was that, as mentioned in Chapter 3, the Genos EI was designed specifically for workplace application (Palmer *et al.*, 2009). Thus, university students may not be the appropriate participant group. This study adopted four dimensions relating to the purpose of the study from the overall inventory with seven dimensions. The other three dimensions are emotional awareness of self, emotional reasoning, and emotional other management. Potential correlations between the other dimensions and humour styles might have been missed. In addition, there is limited empirical evidence from published articles that adopted Genos EI, even though sufficient reliability and validity has been reported by the developers of the measure.

Three studies reported in two articles used TEIQue and TEIQue-SF (Greven *et al.*, 2008b; Vernon *et al.*, 2009). Positive correlations were obtained between adaptive humour styles and global TEI/four facets except for the correlation between affiliative humour and Self-control. Regarding maladaptive humour, maladaptive humour styles were negatively associated with Global TEI and Emotionality. Self-defeating humour was negatively associated with Well-being. No correlation was obtained between maladaptive humour and Sociability. Aggressive humour showed fewer associations than the other three humour styles.

Table 5-3 illustrates summary statistics including the effect sizes and measure of heterogeneity for the relationships between trait EI (TEIQue) and humour styles. Effect size calculations for trait EI (TEIQue) and humour styles illustrated that all twenty correlations, including the five uncorrelated relationships mentioned in the original articles, were found to be significant ($p < 0.05$). The changes might be a result of the larger sample size. The average effect size was 0.26 indicating a small magnitude of the correlation. Small and moderate effect sizes were frequently found. Relationships between global EI and self-enhancing humour, Well-being and self-enhancing humour, and Sociability and affiliative humour are strongest among the 20 pairs of correlations. Relationships between Well-being and aggressive humour, Self-control and affiliative humour, Sociability and aggressive humour were weakest among the 20 pairs of correlations.

Large samples were used in all three studies within two articles (Greven *et al.*, 2008; Vernon *et al.*, 2009). However, the same limitations that apply to the above studies were identified, including the lack of longitudinal design, biases due to using self-report measures, and identical geographic background (Western countries). Greven and colleagues' study (2008) was also limited by convenience sampling and restricted demographics of the participants, that is, the participants were undergraduate and postgraduate students at a UK university and psychology undergraduate students from a German university. As mentioned in the quality appraisal section, psychology students may have had more of an understanding of the research topic than the general population, which could have influenced their

responses to the questionnaires. Vernon and colleagues' study (2009) recruited twin participants from North America and UK, with a wide range of ages from 17 to 90, suggesting a more representative sampling in terms of age than the other eight studies. Although the TEIQue is criticised because of its close relationship with personality, systematic study found the TEIQue consistently accounts for incremental variance in the criteria relating to many areas over the basic dimensions of personality and other related variables (Andrei *et al.*, 2016).

Table 5-3 Summary statistics including effect sizes and measure of heterogeneity for the relationships between TEI and HSQ.

	<i>k</i>	<i>Z</i>	<i>p</i>	\bar{r}	95% <i>CI</i>		<i>Q</i>	<i>p</i>	<i>I</i> ² %	95% <i>CI</i>	
					lower limit	upper limit				lower limit	upper limit
Global TEI											
Affiliative humour	3	12.33	<.001	0.37	0.31	0.42	8.41	<.05	76.21	21.94	92.75
Self-enhancing humour	3	37.67	<.001	0.46	0.43	0.48	1.25	0.535	0.00	0.00	94.63
Aggressive humour	3	-8.40	<.001	-0.16	-0.20	-0.13	3.56	0.169	43.83	0.00	83.20
Self-defeating humour	3	-6.06	<.001	-0.26	-0.34	-0.18	16.77	<.001	88.08	66.71	95.73
Well-being											
Affiliative humour	3	11.12	<.001	0.31	0.26	0.36	7.32	<.05	72.66	7.90	91.88
Self-enhancing humour	3	33.48	<.001	0.46	0.44	0.48	2.33	0.312	14.04	0.00	97.12

Aggressive humour	3	-4.07	<.001	-0.08	-0.12	-0.04	3.73	0.155	46.34	0.00	84.19
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Self-defeating humour	3	-3.65	<.001	-0.22	-0.34	-0.10	33.70	<.001	94.07	86.05	97.48
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Self-control

Affiliative humour	3	1.99	<.05	0.10	0.00	0.19	20.73	<.001	90.35	74.45	96.36
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Self-enhancing humour	3	11.66	<.001	0.33	0.28	0.38	7.40	<.05	72.97	9.15	91.96
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Aggressive humour	3	-4.83	<.001	-0.21	-0.29	-0.12	16.44	<.001	87.83	65.85	95.66
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Self-defeating humour	3	-20.99	<.001	-0.27	-0.29	-0.24	1.00	0.606	0.00	0.00	93.31
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Emotionality

Affiliative humour	3	26.73	<.001	0.34	0.31	0.36	0.41	0.813	0.00	0.00	83.81
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Self-enhancing humour	3	23.02	<.001	0.29	0.27	0.31	1.94	0.378	0.00	0.00	96.55
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Aggressive humour	3	-8.97	<.001	-0.23	-0.28	-0.18	6.06	<.05	66.99	0.00	90.47
Self-defeating humour	3	-4.74	<.001	-0.17	-0.24	-0.10	11.63	<.05	82.80	47.49	94.37
Sociability											
Affiliative humour	3	19.59	<.001	0.41	0.37	0.45	4.36	0.113	54.16	0.00	86.88
Self-enhancing humour	3	23.01	<.001	0.31	0.28	0.33	2.14	0.343	6.48	0.00	96.86
Aggressive humour	3	2.29	<.05	0.05	0.01	0.10	4.71	0.095	57.54	0.00	87.90
Self-defeating humour	3	-3.70	<.001	-0.18	-0.27	-0.08	20.23	<.001	90.11	73.66	96.29

Notes: k = the number of studies; Z = the value to test the null hypothesis; \bar{r} = weighted average effect sizes; Q = heterogeneity test; I^2 = the degree of inconsistency across the studies

In general, trait EI was regularly and positively correlated with adaptive humour styles and negatively correlated in some studies with maladaptive humour styles. Self-enhancing humour showed the most consistent relationship with trait EI across all self-report measures.

5.5 Discussion

5.5.1 Summary

This systematic review used a narrative synthesis and a partial meta-analysis to explore the available evidence about the relationship between EI and humour styles. The current review identified ten relevant studies within nine articles. Effect size calculations for the correlation between TEIQue and HSQ were estimated based on two articles (Greven *et al.*, 2008; Vernon *et al.*, 2009). These studies investigated this relationship across five different EI measures belonging to two EI constructs, ability EI and trait EI. The included articles were generally deemed to be of a good quality when assessed using the quality appraisal criteria (AXIS tool) although there were some important limitations of the studies.

Overall, EI appears to be regularly and positively associated with adaptive humour styles and negatively associated in some studies with maladaptive humour styles. Although trait EI generally showed closer associations with all humour styles than ability EI in this systematic review, this conclusion should be made with caution

because there was only one study focusing on ability EI included in the review. Self-enhancing humour showed the most consistent relationship with both ability EI and trait EI across all measures.

5.5.2 The relationship between ability EI and humour styles

Three pairs of correlation between ability EI and humour styles were obtained: Emotional Management and self-enhancing humour; Emotional Perception and aggressive humour; and Emotional Perception and self-defeating humour. Emotional Perception involves identifying and accurately interpreting emotional information from others, and a focus on emotional self-awareness (Papadogiannis, Logan and Sitarenios, 2009). This branch was negatively correlated with two maladaptive humour styles, indicating that more hostile humour may result from difficulties in identifying and accurately interpreting emotions of self and others. Consistent with the leading DET, those who show more aggressive and self-defeating humour are less able to accurately perceive emotional cues, such that lack of adaptive emotional motivation and response, leads to a tendency to disparage others or selves and suppress their feelings. Self-enhancing humour was found to be positively correlated with Emotional Management. Emotional Management focuses on the ability to effectively regulate their own and others' emotions, such as maintaining good emotional conditions, repairing negative emotions, and appropriately creating emotions in a specific context (Papadogiannis, Logan and Sitarenios, 2009). This branch requires advanced

emotional ability based on processing emotional information, then uses emotion knowledge to drive adaptive responses such as maintaining a positive perspective in adversity. Empathy, as a significant EI sub-component under this process (Austin, 2018), has also been considered to be the main function of self-enhancing humour. In addition, two intrapersonal humour styles were found to be correlated with some aspects of ability EI, suggesting that the interaction between ability EI and humour seem to work more on intrapersonal processes. These findings show that high-ability EI people tend to systematically use intrapersonal humour, suggesting a mechanism to facilitate humour behaviours by emotional skills. This implies that intrapersonal humour may be the process by which ability EI relates to health and wellbeing.

Considering the characteristics of EI and humour styles, affiliative and self-enhancing humour styles were usually deemed to be related to the EI construct (Kuiper *et al.*, 2004). However, in the current review, self-enhancing humour was only related to Emotional Management, and affiliative humour was not correlated with either branches or with total ability EI. This weak relationship might be explained by the different approaches used to assess ability EI (MSCEIT) and humour styles (HSQ). The focus of MSCEIT is the ability of emotional problem-solving skills whereas the HSQ assesses trait-like humour rather than a cognitive ability such as humour production. In addition, in order to control sex differences on MSCEIT and HSQ, partial correlations were used to analyse the data. This may also partly explain the weak relationship. The majority of the correlations

between ability EI and humour styles were non-significant, suggesting that having better emotion knowledge and skills may not be enough to convert EI into adaptive thoughts and actions in everyday life. This corresponds to the studies in the health context, that is, ability EI showed weaker associations with overall health than trait EI (Hughes and Evans, 2016; Martins et al., 2010; Mestre et al., 2016).

5.5.3 The relationship between trait EI and humour styles

From the eight articles adopting self-report measurements to assess EI, including EIS, TEIQue, and Genos EI, the most consistent evidence linking EI and humour styles was found in the overall trait EI. In general, overall trait EI was positively correlated with adaptive humour and negatively related to maladaptive humour. In addition, effect size calculations for trait EI (TEIQue) and humour styles (HSQ) showed that all twenty correlations, including uncorrelated links in the original articles, were found to be significant with small to moderate magnitude. Although the changes might be a result of the larger sample size, these suggested a general correlation between trait EI and humour styles. Emotionally intelligent individuals were more associated with the effective use of benign humour and less with the use of detrimental humour to achieve beneficial life outcomes. The flexible use of humour might be a mechanism by which those who score high on trait EI use it to regulate emotions and produce positive outcomes.

In terms of intrapersonal humour, overall trait EI was positively associated with

self-enhancing humour and sometimes negatively correlated with self-defeating humour. The correlation between Global EI (TEIQue) and self-enhancing humour was the strongest among all correlations from the effect size calculations. These suggest that being confident in EI abilities were more likely to translate strong emotional skills into prosocial and health-promoting behaviours, to drive adaptive humour behaviours and reduce use of maladaptive humour responses.

Looking into the correlations between EI components and the two **intrapersonal** humour styles, reasonably consistent evidence was only found in relation to self-enhancing humour. Self-enhancing humour was positively correlated with all trait EI components. Specifically, the correlation between self-enhancing humour and Well-being (TEIQue) was the strongest among all correlations regarding sub-facets of trait EI from the effect size calculations. These suggest that confidence with emotion knowledge and skills tended to link to a perspective-taking humour in order to manage environmental demands and stressors. This result indicates that empathy may play an important role in the mechanism between trait EI and humour styles. Self-defeating humour was sometimes not associated with Sociability (TEIQue; Vernon *et al.*, 2009), Self-control (TEIQue; Greven *et al.*, 2008), and Appraisal of Emotions (EIS; Wang *et al.*, 2019). Sociability involves adapting to new conditions, excellent social skills and enhancing social relationships, which requires advanced EI skills and interpersonal capabilities. In contrast, self-defeating humour involves mainly intrapersonal functions thus it is plausible that it is less likely to link to other-related emotional skills. Self-control

involves advanced competence like being capable of regulating external stress and controlling emotions. The lack of correlation found between self-control and self-defeating humour suggests that such advanced emotional skills may not be in use when using maladaptive humour. Appraisal of Emotions reflects individuals' accuracy and sensitivity to emotional information. Wang and colleagues (2019) found that accurately perceiving emotional information enabled more adaptive humour styles but was less likely to be helpful in reducing self-defeating humour. However, Karahan *et al.* (2019) found high scores on Appraisal of Emotions were associated with reduced self-defeating humour. Studies using TEIQue also found negative associations between self-defeating humour and EI components relating to perception and understanding (Greven *et al.*, 2008; Vernon *et al.*, 2009). These inconsistent results - about the role of Appraisal of Emotion and the engagement of self-defeating humour - might be due to different settings (e.g., sampling in Asia or Europe; sampling in university students or the general population) or variance in measures (e.g., EIS or TEIQue). The different trait EI measures showed common but also some unique variance (Ferrández *et al.*, 2012; Di Fabio and Saklofske, 2014), such that their relationship with humour styles might vary. The mixed results regarding EIS corresponded to the disagreement around the interpretation and representation of its four subscales. It was argued that the EIS was a single-construct measure (Schutte *et al.*, 1998) and the factor structure was unstable (Pérez, Petrides, and Furnham, 2005), thus results of subscales may differ in using EIS (see Chapter 3). Furthermore, inconsistent results regarding self-defeating humour might be because this subscale of HSQ may not be able to

entirely explain the concept outlined by Martin *et al.* (2003). As mentioned in Chapter 3, self-defeating humour is not always detrimental to health. For example, positive relationships were found between self-defeating humour and well-being indicators (Ruch and Heintz, 2017; Heintz and Ruch, 2018), suggesting possible inconsistent relationships between EI and self-defeating humour.

With respect to **interpersonal** humour, overall trait EI was positively correlated with affiliative humour and sometimes negatively associated with aggressive humour, indicating individuals with increased trait EI usually tend to please others in a harmonious way to improve relationships and reduce tensions (Lefcourt, 2001), and avoid using sarcasm or disparaging humour to put others down (Zillmann, 1983). In line with the Differential Emotions Theory, better emotion knowledge and skills adaptively encourage humorous behaviours. Looking into the correlations between components of trait EI and the two interpersonal humour styles, similar to intrapersonal humour, reasonably consistent evidence was found between affiliative humour and trait EI components, but inconsistent results were found regarding aggressive humour.

Emotionally intelligent people tend to engage in adaptive ways to enhance interpersonal cohesiveness and cope with demands of everyday life thus affiliative humour was found to be correlated with all components of EI except for Self-control in one study (TEIQue; Vernon *et al.*, 2009). Effect size calculations also found a very weak correlation between Self-control (TEIQue) and affiliative

humour. It seems that being capable of controlling desires and regulating stress (intrapersonal capabilities) is sometimes less likely to enhance affiliative humour to strengthen social connections (interpersonal capabilities). Compared with other humour styles, aggressive humour showed the fewest correlations with trait EI components. Although effect size calculations showed significant correlations between aggressive humour and Sociability and Well-being, the magnitudes of these two links were the weakest among all correlations. Sociability was not associated with aggressive humour in three original studies (TEIQue; Greven *et al.*, 2008; Study 1 and 2 in Vernon *et al.*, 2009), suggesting effectively managing others' emotions and excellent social skills (interpersonal capabilities) may not relate to a decrease in self-directed disparagement (intrapersonal capabilities). Aggressive humour has been found to be particularly associated with low levels of empathy (Martin and Ford, 2018b), suggesting a weak relationship with EI. No correlation was identified between Well-being (TEIQue; Greven *et al.*, 2008) and aggressive humour among original studies. Given the weak relationship between aggressive humour and other EI factors, this result is understandable because Well-being mainly depends on the level of the other trait EI factors, thus this correlation might be weakened. Similar to the results about self-defeating humour, aggressive humour was not associated with Appraisal of Emotions in one study (EIS; Wang *et al.*, 2019), but associated with components relating to perceiving, understanding and perspective-taking in other studies (modified EIS- Appraisal of Emotions, Karahan *et al.*, 2019; TEIQue-Emotionality, Greven *et al.*, 2008; Vernon *et al.*, 2009). These findings resonate with the heterogeneous results of the relationship

between aggressive behaviours and empathy. Meta-analysis studies found inconsistent relationships between affective empathy and aggressive behaviours among children and adolescents (Lovett and Sheffield, 2007), and only small variances were found to be shared between empathy and aggressive behaviours among adults (Vachon, Lynam and Johnson, 2014). In addition, it is possible that some EI measures are less likely to appropriately separate between cognitive and affective empathy, such that the associations between aggressive humour and EI components were inconsistent across different EI measures.

The inconsistent results regarding maladaptive humour correspond to previous laboratory studies that found positive (but not negative) humour can be considered as an effective form of emotion regulation (Samson and Gross, 2012). Since emotion regulation was proposed to be the mechanism by which EI produces adaptive outcomes (Mestre *et al.*, 2016), this logically leads to a closer association between EI and adaptive humour than maladaptive humour. This might be explained by the effect of positive emotions, that is, the positive emotions occurring with adaptive humour tend to “undo” negative emotions (Fredrickson and Levenson, 1998), and link to effective emotional skills. This suggests that the interaction between adaptive humour and emotional skills might be more effective than the interaction regarding maladaptive humour. This also suggests that positive emotions may play a role between EI and humour styles. The closer associations for trait EI relative to ability EI imply that, although great emotion knowledge and skills are important, high ability EI could not be sufficient for

individuals to convert such emotional abilities into emotionally intelligent (humorous) responses; individuals must have confidence in their emotional abilities and have the tendency to use them in daily life, which is consistent with the interpretation in the health context literature as mentioned before (Hughes and Evans, 2016; Mestre *et al.*, 2016).

5.5.4 Underlying study biases

Trait EI shows a closer relationship with humour styles than ability EI but as well as the theoretical differences between trait and ability EI, some underlying methodological biases should be considered. First, the results might be contaminated by common method biases (Podsakoff *et al.*, 2003). In this study, trait EI measures and HSQ both assess individuals' typical performance in everyday situations, whereas MSCEIT assesses individuals' maximal performance under certain circumstances. It is, therefore, difficult to confirm to what extent the correlations are due to a true relationship between EI and humour styles or due to the common method of measurement. In addition, as there is only one included study focusing on ability EI, the conclusion should be made with caution.

Second, the psychometric properties of the measurements used should be taken into account. Both trait EI and humour styles overlap to some extent with personality traits (Martin *et al.*, 2003; Siegling, Furnham and Petrides, 2015). Systematic study of the incremental validity of trait EI finds that, for example,

TEIQue consistently accounts for incremental variance in the criteria relating to many areas over the basic dimensions of personality and other related variables (Andrei *et al.*, 2016). This could, however, indicate that TEIQue overlaps more with certain criteria than other measurements rather than mean that the TEIQue is better than other tests. For ability EI, there are individual studies about the incremental validity of ability EI over intelligence and personality in criteria relating to positive relationships and adolescent mental health (Davis and Humphrey, 2012; Lanciano and Curci, 2014). However, conflicting evidence suggests that the MSCEIT scores may not obtain the four-branch structure, that is, models without Emotional Facilitation fitted better to the data (Gardner and Qualter, 2011). With respect to the HSQ, there are individual studies providing conflicting evidence. Páez and colleagues (2013) demonstrated incremental validity of self-enhancing, affiliative and self-defeating humour styles over personality and the previous day's mood in happiness and psychological wellbeing. However, Ruch and Heintz (Ruch and Heintz, 2017) criticised the construct validity when controlling for the non-humorous contexts in the HSQ. They also argued that the self-defeating subscale failed to fully capture the concept of self-defeating humour (Ruch and Heintz, 2017). A recent study distinguished nine styles of humour based on a study which combined the HSQ and Comic Style Markers Questionnaire (Heintz and Ruch, 2019). Therefore, personality may embrace further styles of humour which are not identified by the HSQ. Additional studies are necessary to further investigate these issues.

5.5.5 Strengths and limitations

The current study is the first systematic review to synthesise the evidence for the relationship between EI and humour styles. The systematic review was conducted in a rigorous way with screening, data extraction and quality appraisal conducted independently by two authors (RX and JM). The findings contribute to the understanding of how ability EI and trait EI relate to humour styles by synthesising existing evidence, which may contribute to helping to improve emotional well-being. Furthermore, this study contributes to understanding the associations between specific EI components and humour styles, which may benefit fundamental research on emotion and personality psychology. There are limitations to the current research. First, all studies were cross-sectional in design, which means all data were collected at one time point. Findings at one point in time are limited in explaining what happens before and after this time point (Cummings, 2017). Thus, causal inferences cannot be made and changes across time were not captured because it was difficult to know whether findings could differ at another point in time. By contrast, longitudinal design collects observed data at multiple time points, which is enable the assessment of time-order of causes and outcomes therefore causal inferences can be made (Cummings, 2017). Second, all studies in this review used convenience samples including some university students majoring in psychology in a class. The subject background may influence their response to the questionnaires. In addition, none of the studies involved a nationally representative sample, resulting in less cultural

heterogeneity.

5.6 Conclusion and future directions

This systematic review examined the relationship between EI and humour styles. The results from this qualitative synthesis indicate that, in general, EI is regularly and positively associated with adaptive humour styles and negatively associated in some studies with maladaptive humour styles; trait EI shows broader associations with humour styles than ability EI; self-enhancing humour shows the most consistent relationship with both ability EI and trait EI across all measures. Additionally, the partial meta-analysis demonstrated the correlations between TEIQue and HSQ were of small to moderate magnitude. These conclusions suggest that humour may be one of the potential mediators between EI and adaptive life outcomes.

That said, this systematic review has demonstrated a relative paucity of research on the association between ability EI and humour styles, and the indirect relations between these constructs. EI and humour styles might be linked by positive emotions, according to the broaden-and-build theory of positive emotions (Fredrickson, 1998, 2001). Further studies might explore the role of positive emotions between EI and humour. In addition, how the association between EI and humour is associated with psychological well-being and distress should be further investigated. Another focus for future research should be the way individuals use

humour in different cultures and the role of EI in relationships within diverse cultural backgrounds. Further studies with comprehensive and heterogeneous samples are required to draw more reliable conclusions.

The findings of the systematic review suggested that trait EI, especially measured by the TEIQue, tended to have broader and greater associations with humour styles than ability EI and other trait measures. Given the greater correlations between trait EI (especially measured by the TEIQue) and psychological well-being than ability EI from meta-analytic studies mentioned in Chapter 3, trait EI will be the focus, and the TEIQue will be used, in the following mixed methods study.

5.7 Chapter summary

This chapter presented the stage 1 systematic review about the relationship between EI and psychological well-being. The two research questions related to Phase 1 have been addressed, that is, what has been found in previous studies about the relationship between ability/trait EI and humour styles among adults in non-clinical settings, and how do previous studies explain the relationship between ability/trait EI and humour styles among adults in non-clinical settings. The strengths, limitations, and further directions have been discussed. The systematic review informed that trait EI will be the focus, and the TEIQue will be used, in the following mixed methods study.

Chapter 6 How is EI linked to psychological well-being among university students? The mediating role of humour styles (QUAN)

6.1 Introduction

The association between EI and psychological well-being is well-documented. However, only a few studies have investigated the link between trait EI and psychological well-being through humour styles, especially when psychological well-being was separately assessed as hedonic well-being, eudaimonic well-being and psychological distress. This chapter presents the quantitative component, with a cross-sectional design, of the mixed methods study examining the mediating role of humour styles in the relationship between trait EI and psychological well-being.

As described in previous chapters, there are three cross-sectional quantitative studies that have examined the mediating role of humour in this relationship (Greven *et al.*, 2008; Wang *et al.*, 2019; Huang and Lee, 2019). In general, intrapersonal humour styles (self-enhancing and self-defeating humour) and adaptive humour styles (self-enhancing and affiliative humour) are more likely to play a role in the relationship between EI and psychological well-being. However, some limitations are identified, including, no study focusing on eudaimonic well-being or distress, and the contextual and unconscious characteristics of humour

being neglected. The previous studies used university students as convenience samples. In addition, some findings are inconsistent with the theoretical hypothesis, for instance, affiliative humour does not play a role between trait EI and subjective well-being.

A mixed methods study consisting of a quantitative component and a qualitative component will be presented in Chapters 6 and 7, to explore the role of humour in the relationship between EI and psychological well-being among university students. The quantitative study in this chapter will examine the mediation relationship and improve on some of the limitations identified in previous studies, by studying hedonic well-being, eudaimonic well-being, and distress separately, and deliberately focusing on the population of university students.

The study was undertaken from February to May 2019 at the University of Glasgow. Undergraduate and postgraduate students were invited to take part in an online study. Participants completed seven questionnaires assessing trait EI, humour styles, hedonic and eudaimonic well-being, and psychological distress (anxiety and depression).

However, there were practical constraints on the data collection for this quantitative study and changes were required to adapt to these constraints. This was a cross-sectional rather than longitudinal study because the vast majority of the responding international students were taught postgraduate students who

aimed to graduate within one academic year. Data were collected at the start of semester 2 teaching in order to allow international students to adapt to life and study in Scotland, about three months after enrolment. A longitudinal design usually requires at least three time points, which would make it difficult or impossible to give most international students a third assessment. In addition, comparison of the mediation relationship between home and international students was not conducted. The final sample consisted of 179 international students and 357 home students. The number of home students is more than 50% larger in size than the number of international students. This large difference tends to lead to bias in the results of the statistical tests of multiple-group analysis.

The following describes the methods, pilot study, sample size justification, the full study results and discussion.

6.2 Method

6.2.1 Ethics process and approvals

Ethical approval for the survey and the subsequent interviews (see Chapter 7) was obtained through the College of Medical, Veterinary & Life Sciences (MVLS) ethics committee (Project No: 200180031) at the University of Glasgow on 5th December 2018 and included submission of the ethics application form, participant information sheet, consent form, cover letter for recruitment, and the seven

questionnaires. More detail involving ethics and confidentiality can be found in Chapter 4 and Appendix 1.

6.2.2 Participant and recruitment

All UK/EU students and international students registered in the International Student Office in the University of Glasgow were considered eligible to take part in the study. An international student in the UK, at the time of the study, was defined as “a student who is enrolled in a UK higher education institution undertaking an undergraduate or postgraduate course and is neither a UK citizen, nor refugee, nor immigrant, nor EU student”, and “does not have a permanent residence in the UK” (Harman, 2005; Tran, 2011).

For the pilot study, participants were a convenience sample of students meeting the eligibility criteria who were known to the researcher (RX). For the full study, participants were recruited by an email invitation to opt in on a voluntary basis. Permission to send out emails to students was sought, and approval given by the Head of College of MVLS. Students could not be identified by the group email system used at the University. The questionnaires were administered using Online Surveys. “Online Surveys” is used by many Higher Education Institutions. It has a number of advantages over other similar tools, for example, participants are forced to respond to all required items, or they cannot go forward to the next section. Moreover, Online Surveys ensure its compliance with General Data

Protection Regulation (GDPR) by hosting its data on servers in the UK (<https://www.gla.ac.uk/research/strategy/ourpolicies/useofonlinesurveystoolforresearch/>). All students in MVLS were emailed the cover letter (Appendix 4), participant information (Appendix 2), and a link to the survey on Online Surveys. All participants were informed about the purpose of the study and data protection procedures. The consent form which indicated understanding of the study processes and agreement to participate had to be completed at the start of the survey before proceeding with the questionnaires. The invitation provided contact details of the researcher for any queries. Approval to email all students across the whole University was not given, this is normal practice to protect students from study overload. Students in the remaining three Colleges within the University of Glasgow, the College of Arts, College of Science & Engineering, and College of Social Sciences, were, therefore, recruited by invitation posted on social media platforms (Facebook and WeChat). Completed data was downloaded from Online Surveys and saved by RX.

6.2.3 Measures

Demographic information and background data were collected. Seven psychometrically validated questionnaires were used to assess trait EI, humour styles, hedonic well-being (positive and negative affect; life satisfaction), eudaimonic well-being (psychological well-being), and psychological distress (depression; anxiety).

6.2.3.1 Demographic and background data

Participants' age, gender, marital status (single vs. not single), education level (undergraduate, postgraduate taught, postgraduate research and other), ethnicity (White, Mixed/Multiple, Asian/Asian British or Scottish, Black/African/Caribbean/Black British or Scottish, and other), and source of students (UK/EU vs. international) were collected. The reasons for this were that as reported in previous chapters, gender differences were found in some study variables, including trait EI, humour styles, and mental health indicators. In addition, educational qualifications tend to have comparable effects on well-being as socioeconomic factors (Huppert, 2009). Similarly, humour styles were found to be a contributor to relationship satisfaction (Martin *et al.*, 2003). In order to understand the consist of international students, information on ethnicity was collected. Ethnic group classification followed the UK Government population Census classification (List of ethnic groups - GOV.UK, 2021)

6.2.3.2 Psychometric measures

Seven questionnaires, assessing trait EI, humour styles, hedonic and eudaimonic well-being, and psychological distress (anxiety and depression), were adopted in the study. They were the *Trait Emotional Intelligence Questionnaire - Short Form* (TEIQue-SF, v. 1.50; Petrides, 2009) for trait EI, the *Humour Styles Questionnaire* (HSQ; Martin *et al.*, 2003) for humour styles, the *Positive and Negative Affect*

Schedule (PANAS; Watson, Clark and Tellegen, 1988) and the *Satisfaction with Life Scale* (SWLS; Diener *et al.*, 1985) for hedonic well-being, the *Psychological Well-Being Scales* (SPWB; Ryff and Keyes, 1995) for eudaimonic well-being, the *Patient Health Questionnaire - 9* (PHQ-9; Spitzer *et al.*, 1999) for depression, and the *Generalized anxiety disorder - 7* (GAD-7; Spitzer *et al.*, 2006) for anxiety. Detailed information for the seven questionnaires can be found in Chapter 4.

6.2.4 Pilot study

I explained the aim of the study to the volunteer participants and obtained signed consent from them. Participants completed the 7 questionnaires in order: the positive and negative affect schedule (PANAS); satisfaction with life scale (SWLS); PHQ-9, GAD-7; humour styles questionnaires (HSQ); trait emotional intelligence questionnaires - short form (TEIQue-SF); and scale of psychological well-being by Ryff (SPWB). Feedback involving typesetting, questionnaire length, and the meaning of some items was requested (see Appendix 13).

6.2.5 Full study

6.2.5.1 Sample size justification

Three criteria were adopted to justify the sample size calculation. Firstly that the number of observations should be 10 times the number of items in the longest

questionnaire (Psychological Well-Being Scales, 42 items). And secondly, it was suggested that a minimum of 200 observations is required for a simple structural equation model (e.g., Tomarken and Waller, 2005). Other researchers suggest that the sample size should be 5 to 10 times the number of estimated parameters (Bentler and Chou, 1987). Thus, the sample size of the current study was calculated that it should be at least 420.

6.2.5.2 Participants

Students from the College of MVLS and the other three Colleges completed the questionnaires online. The order of the questionnaires was the same as in the pilot study. Because Online Surveys do not allow missing answers, there are no missing data in the current study. All participants were enrolled as the study population.

6.2.5.3 Statistical Analysis

Two sets of analyses, detailed below, were performed to answer the research questions that (1) what is the association between trait EI, humour styles, and psychological well-being? (2) how do humour styles mediate the relationship between trait EI and psychological well-being?

6.2.5.3.1 Group differences and correlations

Independent sample t-tests and ANOVA were used to examine group differences among different demographic and background variables. Pearson's correlation analysis was conducted to analyse the associations between all study variables. Data analysis was conducted using the statistical package SPSS 26.0 (IBM Corp, 2019), $p < 0.05$ was regarded as statistically significant.

6.2.5.3.2 Partial Least Squares Structural Equation Modelling and mediation analysis

Partial Least Squares Structural Equation Modelling (PLS-SEM) was performed with SmartPLS 3 (Ringle, Wende, and Becker, 2015) to estimate the indirect effects of trait EI on psychological life outcomes through the four humour styles. Parcelling was adopted to construct PLS-SEM, which is usually used in multivariate approaches to psychometrics, particularly for use with exploratory factor analysis in SEM (Little *et al.*, 2002). A parcel can be defined as “an aggregate-level indicator comprised of the sum (or average) of two or more items, responses, or behaviours” (Little *et al.*, 2002, p. 152). Each construct was estimated by three or four parcels as indicators. For trait EI and psychological well-being, the internal-consistency approach (Kishton and Widaman, 1994) was conducted to create parcels because they are multidimensional constructs (Little *et al.*, 2002). That is, the sum scores of each of the four factors of trait EI were used as indicators of TEI; the sum scores of two randomly dimensions of psychological well-being were used as indicators of PWB. For each style of humour, life

satisfaction, positive affect, negative affect, depression, and anxiety, three randomly determined parcels were created as indicators for each of them because all of them were unidimensional constructs (Little *et al.*, 2002, 2013).

A mediation analysis was performed to determine which humour styles mediated the relationship between trait EI and psychological well-being. Bootstrapping was used to analyse the significance of mediation analysis (MacKinnon, Lockwood and Williams, 2004). A resampling of 5000 was used in the current study. The 95% confidence intervals (CI) did not include 0 indicating that the indirect effects were significant at $p < .05$ (MacKinnon, Lockwood and Williams, 2004).

The effects of humour styles on the relationship between trait EI and psychological outcomes were investigated. A set of PLS-SEMs were estimated with trait EI as the independent variable X , humour styles as the “indirect contributors” M , and life satisfaction, positive affect, and negative affect as the dependent variables in model (SWB), psychological well-being as the dependent variable in model (PWB), and depression and anxiety as the dependent variables in model (MD). Using the PLS-SEM analysis, both direct effect c' and indirect effect $a \times b$ can be estimated. Figure 6-1 showed the hypothetical model.

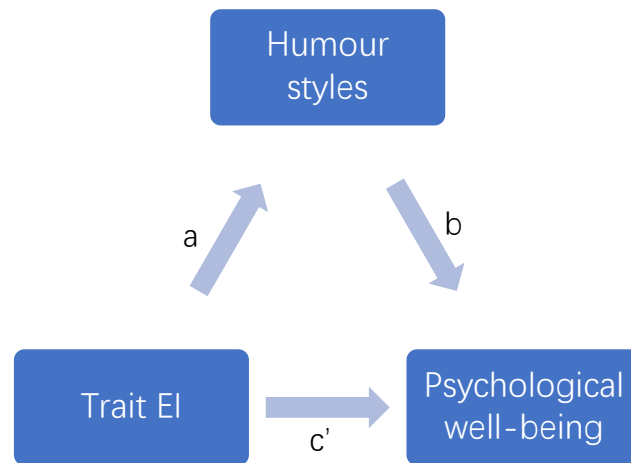


Figure 6-1 Hypothetical model

Multiple-group analysis examining group differences was not conducted due to the uneven sample size of the two subgroups. This is because when one subgroup is more than a half larger in size than the other subgroup, this large difference tends to lead to bias in the results of the statistical test of multiple-group analysis (Matthews, 2017).

Model evaluation. As detailed in Chapter 4, the assessment of PLS path modelling in explanatory research settings were conducted in two steps: (1) testing the measurement model, and (2) testing the structural model. The following describes the thresholds of each criterion explained in Chapter 4.

For the **measurement model**, a Cronbach's alpha value greater than 0.7 indicates an acceptable level of model reliability (Hair *et al.*, 2016). Composite reliability (CR) and average variance extract (AVE) values of each construct were greater than 0.6 and 0.5 respectively indicating an appropriate level of convergent validity

(Fornell and Larcker, 1981; Hair *et al.*, 2016). The factor loadings of all items should be higher than 0.7 if acceptable. The consistent reliability coefficient Rho_A should be greater than 0.7 indicating an acceptable level (Dijkstra and Henseler, 2015). For the discriminant validity, Fornell-Larcker Criterion requires the levels of the square root of the AVE of each variable to be higher than the correlation among the latent variable involving the principal constructs; the value of Heterotrait-Monotrait Ratio (HTMT) should be lower than 0.9 indicating the fulfilment of discriminant validity (Hair *et al.*, 2016).

For the **structural model**, all VIF values are significantly less than 3 indicating the robustness of the model (Becker *et al.*, 2015). The R^2 values of 0.75, 0.5, and 0.25 indicate substantial, moderate, and weak predictive power, respectively (Henseler, Ringle and Sinkovics, 2009; Hair, Ringle and Sarstedt, 2011). The f^2 values of 0.02, 0.15, and 0.35 indicate small, medium, and significant effects, respectively (Cohen, 2013). Greater than zero of Stone and Geisser's Q^2 value indicates the significance of the model, and the values of 0.02, 0.15, and 0.35 indicate small, medium, and significant predictive importance (Stone, 1974; Geisser, 1975). The value of the standardised root mean square residual (SRMR) should be lower than 0.08 (Hair *et al.*, 2016).

6.3 Results

6.3.1 Pilot study

Six students from China, Indonesia and India participated in the pilot study. Participants usually spent 20 to 30 mins in total completing the questionnaires. Feedback from the pilot participants concerned typesetting, questionnaire length, and the meaning of some items. In response to pilot participant feedback, I reset the typesetting of the questionnaires and made explanatory notes for some questions that were reported as difficult to understand. I also recommended the website, “Helping Distressed Students: A Guide for University Staff”, at the end of the whole study as a resource for participants who may become distressed (although none of the participants in the pilot study reported distress). The detail of pilot participant feedback can be found in Appendix 14.

6.3.2 Full study

6.3.2.1 Descriptive statistics

A total of 536 students aged 17 to 69 years ($M = 24.10$, $SD = 6.06$) participated in the full study. All students were from the University of Glasgow, Glasgow, UK. Of the 536 participants, 489 students (91%) were from MVLS and 47 participants were from the other three Colleges in the University of Glasgow. The response rate from MVLS (via group email) was 8% (489 out of 6456 students). The response rate for the other colleges could not be calculated due to the recruitment method (via social media), because the number of students who saw the online invitation was not clear. A total of 536 participants were, therefore, included in the statistical

analysis. Three quarters of the participants were women. About a third were international students. Regarding the education level of participants, over half (59%) were undergraduate students, 23% were postgraduate taught students, and 17% were postgraduate research students (PhD students). Regarding self-reported ethnic groups, 75% identified as White, and 20% as Asian and the remainder were Mixed/Multiple, Black/African/Caribbean/Black British or Scottish, and other. For marital status, 78% were single. Table 6-1 illustrates the demographic characteristics.

Table 6-1 Demographic characteristics of respondents to the online study.

Categorical variables		N	%
Gender	Male	131	24
	Female	401	75%
	Other	4	1%
Source of Student	International students	179	33%
	UK/EU students	357	67%
Education	Undergraduate	318	59%
	Postgraduate taught	123	23%
	Postgraduate research	93	17%
	Other	2	0%
Marital Status	Single	418	78%
	Not single	118	22%
Self-identified Ethnic Group or Background	White	391	73%
	Mixed / Multiple ethnic groups	21	4%
	Asian/Asian British or Scottish	105	20%
	Black / African / Caribbean / Black British or Scottish	6	1%
	Other ethnic groups	13	2%

Note: not single includes living together, married, divorced/separated, and widowed.

Table 6-2 presents the means, standard deviations, and ranges of scores on all measures. Distributions of all variables were nearly normal.

Table 6-2 Means, Standard Deviations, Skewness and Cronbach's alpha coefficients relative to age, trait emotional intelligence, humour styles, hedonic well-being, eudaimonic well-being, depression, and anxiety in respondents to the online study.

	<i>M</i>	<i>SD</i>	<i>Skewness</i>	<i>Alpha</i>
Age	24.10	6.06	N/A	N/A
<i>Trait Emotional Intelligence</i>				
Global EI	4.75	.89	-.33	.91
Well-being	5.15	1.29	-.83	.89
Self-control	4.13	1.10	-.05	.71
Emotionality	4.95	1.07	-.35	.76
Sociability	4.60	1.05	-.22	.74
<i>Humour styles</i>				
Affiliative	45.08	8.19	-1.19	.87
Self-enhancing	35.61	9.18	-.26	.83
Aggressive	27.04	8.46	.26	.75
Self-defeating	30.93	10.29	.09	.86
<i>Hedonic well-being</i>				
Positive affect	29.93	8.05	-.19	.89
Negative affect	21.18	7.90	.88	.88
Life satisfaction	23.73	6.74	-.52	.86
<i>Eudiamonic well-being</i>				
Overall score	176.78	32.11	-.38	.95
<i>Depression</i>				
PHQ-9	8.67	6.16	.85	.89
<i>Anxiety</i>				
GAD-7	6.66	5.13	.78	.89

Note: N=536

Table 6-3 shows the distribution of depression and anxiety scores.

Table 6-3 Distribution of PHQ-9 and GAD-7 scores of respondents.

	<i>N</i>	%
Level of depression severity, PHQ-9 score		
Minimal, 0-4	157	29.3%
Mild, 5-9	176	32.8%
Moderate, 10-14	107	20.0%
Moderately severe, 15-19	60	11.2%
Severe, 20-27	36	6.7%
Level of anxiety severity, GAD-7 score		
Minimal, 0-4	272	50.7%
Mild, 5-9	137	25.6%
Moderate, 10-14	93	17.4%
Severe, 15-21	34	6.3%

Note: *N*=536. PHQ-9 = Patient health questionnaire - 9; GAD-7 = Generalized anxiety disorder - 7.

6.3.2.2 Group differences

6.3.2.2.1 Male and female students

Table 6-4 details the statistically significant differences between males and females on trait EI (Self-control and Emotionality), aggressive humour, positive affect, depression and anxiety. Females obtained significantly higher mean scores than males on Emotionality ($t_{(530)}=-3.60$, $p < .001$); and reported higher levels of depression ($t_{(530)}=-2.34$, $p < .05$) and anxiety ($t_{(530)}=-2.87$, $p < .001$). Males obtained significantly higher mean scores than females on Self-control ($t_{(530)}=3.32$, $p < .001$), aggressive humour ($t_{(530)}=6.58$, $p < .001$); and reported higher level of positive affect ($t_{(530)}=3.01$, $p < .001$).

Table 6-4 Independent sample t-tests. Gender differences on trait EI, humour styles, hedonic well-being, eudaimonic well-being, depression and anxiety.

	<i>Mean (SD)</i>		<i>t</i>
	Male (n=131)	Female (n=401)	
<i>Trait EI</i>			
Global EI	4.71 (0.86)	4.76 (0.89)	-0.54
Well-being	5.12 (1.28)	5.17 (1.29)	-0.36
Self-control	4.40 (1.11)	4.04 (1.08)	3.32**
Emotionality	4.67 (1.09)	5.05 (1.04)	-3.60**
Sociability	4.68 (1.00)	4.57 (1.07)	1.01
<i>Humour styles</i>			

Affiliative humour	45.79 (7.67)	44.86 (8.35)	1.12
Self-enhancing humour	36.73 (9.19)	35.28 (9.17)	1.57
Aggressive humour	31.11 (9.03)	25.72 (7.82)	6.58**
Self-defeating humour	31.19 (9.88)	30.87 (10.44)	0.31
<i>Hedonic well-being</i>			
Positive affect	31.73 (7.88)	29.31 (8.01)	3.01**
Negative affect	21.13 (7.93)	21.13 (7.87)	0.00
Life satisfaction	23.40 (6.41)	23.85 (6.80)	-0.65
<i>Eudaimonic well-being</i>			
Overall score	175.85 (31.50)	177.07 (32.22)	-0.38
<i>Depression</i>	7.56 (5.83)	9.01 (6.21)	-2.34*
<i>Anxiety</i>	5.53 (4.72)	7.01 (5.22)	-2.87**

Note: ** $p < 0.01$; * $p < .05$.

6.3.2.2.2 UK/EU and international students

Table 6-5 presents the statistically significant differences between UK/EU and international students on trait EI (Global EI, Self-control and Well-being), affiliative humour, aggressive humour, self-defeating humour, overall psychological well-being, and depression. International students obtained significantly higher mean scores than UK/EU students on Well-being ($t_{(415.23)}=2.14$, $p < .001$), Self-control ($t_{(534)}=4.97$, $p < .001$) and Global EI

($t_{(534)}=3.09$, $p < .001$); and reported higher levels of overall psychological well-being ($t_{(534)}=3.00$, $p < .001$). UK/EU students obtained significantly higher mean scores than international students on affiliative humour ($t_{(314.67)}=-2.72$, $p < .001$), aggressive humour ($t_{(534)}=-2.76$, $p < .001$), and self-defeating humour ($t_{(534)}=-4.10$, $p < .001$); and reported higher level of depression ($t_{(417.79)}=-2.78$, $p < .001$).

Table 6-5 Independent sample t-tests. Differences between international students and UK/EU students on trait EI, humour styles, hedonic well-being, eudaimonic well-being, depression and anxiety.

	<i>Mean (SD)</i>		<i>t</i>
	International (n=179)	UK/EU (n=357)	
<i>Trait EI</i>			
Global EI	4.91 (0.86)	4.67 (0.89)	3.09**
Well-being	5.31 (1.14)	5.07 (1.36)	2.14**
Self-control	4.45 (1.04)	3.96 (1.09)	4.97**
Emotionality	5.02 (1.01)	4.92 (1.05)	0.98
Sociability	4.66 (0.99)	4.57 (1.08)	0.97
<i>Humour styles</i>			
Affiliative humour	43.66 (8.92)	45.79 (7.72)	-2.72**
Self-enhancing humour	35.97 (9.45)	35.42 (9.05)	0.64
Aggressive humour	25.62 (7.72)	27.75 (8.73)	-2.76**
Self-defeating	28.39 (9.43)	32.20 (10.47)	-4.10**

humour

Hedonic well-being

Positive affect	30.51 (8.17)	29.64 (7.98)	1.17
Negative affect	21.14 (7.66)	21.19 (8.03)	-0.07
Life satisfaction	24.39 (6.20)	23.40 (6.97)	1.66

Eudaimonic well-being

Overall score	182.61 (31.63)	173.85 (31.99)	3.00**
<i>Depression</i>	7.69 (5.40)	9.17 (6.46)	-2.78**
<i>Anxiety</i>	6.07 (4.96)	6.96 (5.20)	-1.93

Note: ** $p < 0.01$; * $p < .05$.

6.3.2.2.3 undergraduate, postgraduate taught and postgraduate research (PhD) students

Table 6-6 presents the statistically significant differences that were found among undergraduate, postgraduate taught and postgraduate research (PhD) students on trait EI (Well-being, Self-control, Emotionality and Global EI), overall psychological well-being, negative affect, life satisfaction, depression and anxiety.

Undergraduate students obtained significantly lower mean scores than postgraduate taught and postgraduate research students on Self-control ($F=5.95$, $p<.01$), Emotionality ($F=2.97$, $p<.01$) and Global EI ($F=5.75$, $p<.01$);

obtained significantly lower mean scores than postgraduate research students on Well-being ($F=2.84$, $p<.05$); and reported higher levels of anxiety than postgraduate research students ($F=2.65$, $p<.05$).

Postgraduate research students reported significantly lower levels of negative affect ($F=5.52$, $p<.01$) and depression ($F=10.87$, $p<.01$) than undergraduate and postgraduate taught students; and reported significantly higher levels of life satisfaction ($F=3.27$, $p<.05$) and overall psychological well-being ($F=6.88$, $p<.01$) than undergraduate and postgraduate taught students.

Table 6-6 One-way ANOVA. Differences between undergraduate, postgraduate taught and postgraduate research (PhD) students on trait EI, humour styles, hedonic well-being, eudaimonic well-being, depression and anxiety.

	<i>Mean (SD)</i>			<i>F</i>	Multiple comparisons
	a. Undergraduate (n=318)	b. Postgraduate taught (n=123)	c. Postgraduate research (n=93)		
<i>Trait EI</i>					
Global EI	4.63 (0.89)	4.84 (0.88)	5.04 (0.80)	5.75**	a<b, a<c
Well-being	5.05 (1.36)	5.16 (1.22)	5.49 (1.07)	2.84*	a<c
Self-control	3.97 (1.11)	4.26 (0.98)	4.47 (1.11)	5.95**	a<b, a<c
Emotionality	4.84 (1.07)	5.07 (1.05)	5.17 (1.06)	2.97*	a<b, a<c
Sociability	4.52 (1.07)	4.71 (0.98)	4.70 (1.07)	1.32	
<i>Humour styles</i>					
Affiliative	45.23 (8.17)	44.92 (8.53)	44.90 (7.91)	0.38	

humour					
Self-enhancing humour	35.16 (8.85)	36.80 (9.56)	35.61 (9.76)	1.03	
Aggressive humour	27.34 (8.63)	26.66 (8.15)	26.53 (8.30)	0.37	
Self-defeating humour	31.77 (9.99)	30.65 (10.59)	28.47 (10.64)	2.57	
<i>Hedonic well-being</i>					
Positive affect	29.40 (8.13)	30.51 (7.76)	30.92 (8.12)	1.25	
Negative affect	21.92 (8.16)	21.41 (7.29)	18.24 (7.17)	5.52**	a>c, b>c
Life satisfaction	23.61 (6.85)	22.67 (6.80)	25.49 (5.96)	3.27*	a<c, b<c
<i>Eudaimonic well-being</i>					
Overall score	173.00 (32.53)	176.76 (32.68)	189.88 (26.38)	6.88**	a<c, b<c
<i>Depression</i>	9.60 (6.37)	8.63 (5.68)	5.57 (5.07)	10.87**	a>c, b>c
<i>Anxiety</i>	7.04 (5.20)	6.69 (4.77)	5.34 (5.25)	2.65*	a>c

*Note: ** $p < 0.01$; * $p < .05$.*

6.3.2.3 Correlations

As anticipated, trait EI and its subscales were positively correlated with all

adaptive humour styles (correlations ranged from .13 to .48, $p < .01$); and negatively correlated with all maladaptive humour styles (correlations ranged from -.10, $p < .05$ to -.33, $p < .01$), except for the correlations between aggressive humour and Well-being, and with Sociability. Also, trait EI and its subscales were positively correlated with life satisfaction, positive affect, and overall psychological well-being (correlations ranged from .27 to .90, $p < .01$); negatively correlated with negative affect, depression and anxiety (correlations ranged from -.20 to -.63, $p < .01$).

Adaptive humour styles were positively correlated with life satisfaction, positive affect, and overall psychological well-being (correlations ranged from .17 to .46, $p < .01$); negatively correlated with negative affect, depression and anxiety (correlations ranged from -.10, $p < .05$ to -.30, $p < .01$), except for the correlations between affiliative humour and anxiety. For maladaptive humour styles, negative correlations between self-defeating humour and life satisfaction, positive affect, and overall psychological well-being were significant (correlations ranged from -.15 to -.35, $p < .01$). Positive correlations between self-defeating humour and negative affect, depression and anxiety were significant (correlations ranged from .27 to .41, $p < .01$). Aggressive humour was only positively correlated with negative affect ($r = .11$, $p < .05$) and negatively correlated with overall psychological well-being ($r = -.11$, $p < .05$). Table 6-7 presents correlations (*Pearson's r*) of all study variables.

Table 6-7 Correlations between gender, age, trait EI, humour styles, hedonic well-being, eudaimonic well-being, depression, and anxiety in the study.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 Gender	1																
2 Age	-.01	1															
<i>Trait EI</i>																	
3 TEI.Well-being	.01	.07	1														
4 TEI.Self-control	-.14**	.14**	.59**	1													
5 TEI.Emotionality	.14**	.15**	.55**	.38**	1												
6 TEI.Sociability	-.04	.03	.52**	.39**	.45**	1											
7 Global EI	.02	.14**	.86**	.74**	.77**	.72**	1										
<i>Humour styles</i>																	
8 Affiliative humour	-.05	-.06	.37**	.13**	.34**	.39**	.39**	1									
9 Self-enhancing humour	-.07	.03	.48**	.37**	.27**	.36**	.47**	.51**	1								
10 Aggressive humour	-.27**	-.12**	-.08	-.10*	-.24**	.07	-.14**	.24**	.16**	1							
11 Self-defeating humour	-.02	-.10*	-.32**	-.33**	-.16**	-.14**	-.32**	.23**	.17**	.32**	1						
<i>Hedonic well-being</i>																	
12 Positive affect	-.12**	.09*	.49**	.35**	.27**	.34**	.50**	.17**	.33**	.06	-.15**	1					

13	Negative affect	.02	-.12**	-.43**	-.38**	-.30**	-.20**	-.42**	-.15**	-.15**	.11*	.27**	-.13**	1				
14	Life satisfaction	.02	.00	.69**	.49**	.39**	.41**	.65**	.19**	.30**	-.03	-.28**	.40**	-.39**	1			
<i>Eudaimonic well-being</i>																		
15	Psychological well-being	.02	.13**	.85**	.64**	.61**	.64**	.90**	.38**	.46**	-.11*	-.35**	.51**	-.43**	.70**	1		
<i>Distress</i>																		
16	Depression	.11*	-.15**	-.63**	-.54**	-.31**	-.31**	-.58**	-.10*	-.23**	.06	.41**	-.42**	.57**	-.56**	-.61**	1	
17	Anxiety	.13**	-.07	-.52**	-.55**	-.28**	-.28**	-.52**	-.08	-.21**	.02	.28**	-.32**	.55**	-.45**	-.50**	.72**	1

Note: N = 536; TEI = trait emotional intelligence; ** $p < .01$; * $p < .05$.

6.3.2.4 Mediation analysis

A set of multiple mediation models about the relationships between trait EI, humour styles and psychological life outcomes (hedonic well-being, eudaimonic well-being, psychological distress) were estimated. PLS-SEM approach was used with a reflective measurement model (Hair *et al.*, 2019) to examine the hypothesized model set. The presentation of results includes two steps: (1) testing the measurement model, and (2) testing the structural model.

6.3.2.4.1 The mediating effects of humour styles on the relationship between trait EI and hedonic well-being (Model-SWB)

The measurement proportion of the mediation model consists of 8 latent factors (trait EI, affiliative humour, self-enhancing humour, aggressive humour, self-defeating humour, positive affect, negative affect, and life satisfaction) and 25 observed variables. Table 6-8 illustrates the indicators used for the outer measurement model. All variables' values of Cronbach's α , CR, AVE, and rho_A were fulfilled. All factor loadings of indicators for the latent variables in the model should be higher than 0.7. If the values of few items are slightly lower than 0.7 (Sarstedt *et al.*, 2014), they also can be accepted if other indicators such as CR, AVE, and Cronbach's alpha meet the criteria (Hair *et al.*, 2016). Thus, all the

latent constructs were properly estimated by the corresponding indicators.

Table 6-8 Indicators of the measurement model (Model-SWB). Results of indicator loadings, internal consistency reliability, and convergent validity.

Constructs	Items	Outer loading	α	rho_A	CR	AVE
Trait EI	Emotionality	.735	.787	.827	.862	.611
	Self-control	.762				
	Sociability	.730				
	Well-being	.888				
Affiliative humour	AF1	.895	.874	.881	.922	.798
	AF2	.890				
	AF3	.895				
Self-enhancing humour	SE1	.868	.847	.857	.907	.764
	SE2	.884				
	SE3	.870				
Aggressive humour	AG1	.849	.753	.815	.836	.636
	AG2	.902				
	AG3	.612				
Self-defeating humour	SD1	.876	.846	.938	.904	.759
	SD2	.923				
	SD3	.812				
Positive affect	PA1	.881	.891	.897	.932	.822
	PA2	.932				
	PA3	.906				
Negative	NA1	.903	.888	.889	.931	.817

affect						
	NA2	.905				
	NA3	.904				
Life						
satisfaction	LS1	.910	.847	.872	.907	.766
	LS2	.905				
	LS3	.806				

Note: *AF* = affiliative humour; *SE* = self-enhancing humour; *AG* = aggressive humour; *SD* = self-defeating humour; *PA* = positive affect; *NA* = negative affect; *LS* = life satisfaction; *CR* = composite reliability; *AVE* = average variance extracted; *a* = Cronbach's Alpha.

All indicators of discriminant validity (i.e., Fornell-Larcker Criterion and HTMT) met the criteria. Tables of Fornell-Larcker Criterion and HTMT can be found in Appendix 14.

Table 6-9 shows that all indicators of the structured model met the criteria. The value of SRMR (0.065) indicates a good fit (Hu and Bentler, 1998).

Table 6-9 Indicators of structured model (Model-SWB). Results of variance inflation factor, coefficient of determination, effect size, Q^2 value, and standardized root mean square residual.

Constructs	R^2	f^2	Q^2	VIF	SRMR
HSAF	.155	.183	.121	1.584	.065
HSAG	.016	.016	.007	1.182	
HSSD	.110	.123	.077	1.501	
HSSE	.244	.322	.181	1.739	

LS	.434	.386	.322
NA	.210	.082	.166
PA	.268	.130	.213
TEI			1.925

Note: HSAF = affiliative humour; HSSE = self-enhancing humour; HSAG = aggressive humour; HSSD = self-defeating humour; PA = positive affect; NA = negative affect; LS = life satisfaction; TEI = trait emotional intelligence; VIF = variance inflation factor; SRMR = standardized root mean square residual.

A multiple mediation model with trait EI as the independent variable, four mediators (affiliative humour, self-enhancing humour, aggressive humour, and self-defeating humour), and hedonic well-being (positive affect, negative affect, and life satisfaction) as dependent variables showed an acceptable fit to the data as presented above. A mediation analysis was performed to determine which humour styles mediated the relationship between trait EI and hedonic well-being. Bootstrapping was used to analyse the significance of mediation analysis (MacKinnon, Lockwood and Williams, 2004). A resampling of 5000 was used in the current study.

Table 6-10 and table 6-11 illustrate the results of direct and indirect effects of the structural model. The total effect of trait EI on positive affect was significant ($\beta = .482, p < .001$). The indirect effect of trait EI on positive affect through self-enhancing humour was significant ($\beta = .085, p < .05$). Higher trait EI increased the use of self-enhancing humour ($\beta = .494, p < .001$), which in turn contributed to a

higher level of positive affect ($\beta = .173, p < .05$). Results of bootstrapping confirmed a complementary partial mediation from trait EI through self-enhancing humour to positive affect, indicating that self-enhancing humour partially explained the relationship between trait EI and positive affect.

The total effect of trait EI on negative affect was significant ($\beta = -.427, p < .001$). The indirect effect of trait EI on negative affect through self-defeating humour was significant ($\beta = -.053, p < .05$). Higher trait EI decreased the use of self-defeating humour ($\beta = -.331, p < .001$), which in turn reduced the positive effect of self-defeating humour on negative affect ($\beta = .161, p < .001$). A competitive partial mediation was found from trait EI through self-defeating humour to negative affect, suggesting that self-defeating humour partially explained the negative effect of trait EI on negative affect.

The total effect of trait EI on life satisfaction was significant ($\beta = .649, p < .001$). However, all four humour styles did not play a significant role in explaining the correlation between trait EI and life satisfaction, because the indirect pathways from trait EI through each humour style to life satisfaction were all nonsignificant. Hence from this model humour cannot explain the correlation between trait EI and life satisfaction.

Table 6-10 PLS-SEM: significance of structural paths (direct effects) for Model-SWB.

Structural paths	β-value	T value	CI (Bias Corrected)		P-value	Outcomes
			2.5%	97.5%		
HSAF -> LS	-.077	1.477	-.175	.026	.140	Not supported
HSAF -> NA	-.078	1.382	-.193	.029	.167	Not supported
HSAF -> PA	-.100	1.832	-.210	.005	.067	Not supported
HSAG -> LS	.070	1.546	-.021	.156	.122	Not supported
HSAG -> NA	.049	1.066	-.054	.131	.286	Not supported
HSAG -> PA	.126	2.948	.031	.202	.003*	<i>Supported</i>
HSSD -> LS	-.084	2.046	-.169	-.008	.041*	<i>Supported</i>
HSSD -> NA	.161	3.577	.074	.248	.000*	<i>Supported</i>
HSSD -> PA	-.073	1.553	-.162	.021	.120	Not supported
HSSE -> LS	.025	.564	-.065	.115	.573	Not supported
HSSE -> NA	.033	.641	-.065	.137	.522	Not supported
HSSE -> PA	.173	3.412	.070	.268	.001*	<i>Supported</i>
TEI -> HSAF	.394	9.466	.308	.472	.000*	<i>Supported</i>
TEI -> HSAG	-.127	2.334	-.209	.023	.020*	<i>Supported</i>

TEI -> HSSD	-.331	8.557	-.402	-.251	.000*	Supported
TEI -> HSSE	.494	14.518	.424	.557	.000*	Supported
TEI -> LS	.648	16.851	.568	.718	.000*	Supported
TEI -> NA	-.353	6.344	-.458	-.241	.000*	Supported
TEI -> PA	.428	8.700	.331	.523	.000*	Supported

Note: HSAF = affiliative humour; HSSE = self-enhancing humour; HSAG = aggressive humour; HSSD = self-defeating humour; PA = positive affect; NA = negative affect; LS = life satisfaction; TEI = trait emotional intelligence; CI = confidence interval; * $p < .05$

Table 6-11 PLS-SEM: significance of structural paths (indirect effects) for Model-SWB.

Structural paths	Indirect effect	T value	P-value	CI (Bias Corrected)		Interpretation
				2.5%	97.5%	
TEI -> HSAF -> PA	-.039	1.792	.073	-.084	.002	Not supported
TEI -> HSSE -> PA	.085	3.250	.001*	.035	.137	Supported
TEI -> HSAG -> PA	-.016	1.874	.061	-.035	-.001	Not supported
TEI -> HSSD -> PA	.024	1.515	.130	-.007	.055	Not supported
TEI -> HSAF -> NA	-.031	1.363	.173	-.078	.011	Not supported
TEI -> HSSE -> NA	.016	.634	.526	-.032	.068	Not supported
TEI -> HSAG -> NA	-.006	.936	.349	-.021	.005	Not supported

TEI -> HSSD -> NA	-.053	3.256	.001*	-.088	-.024	Supported
TEI -> HSAF -> LS	-.030	1.426	.154	-.072	.010	Not supported
TEI -> HSSE -> LS	.013	.558	.577	-.032	.057	Not supported
TEI -> HSAG -> LS	-.009	1.230	.219	-.027	.002	Not supported
TEI -> HSSD -> LS	.028	1.957	.050	.003	.061	Not supported

Note: HSAF = affiliative humour; HSSE = self-enhancing humour; HSAG = aggressive humour; HSSD = self-defeating humour; PA = positive affect; NA = negative affect; LS = life satisfaction; TEI = trait emotional intelligence; CI = confidence interval; * $p < .05$

Overall, the relationship between trait EI and positive affect was mediated by self-enhancing humour (95% CI = [.035, .137]). The relationship between trait EI and negative affect was mediated by self-defeating humour (95% CI = [-.088, -.024]). Humour styles partially mediated the link from trait EI to hedonic well-being. Figure 6-2 illustrates the mediation model in its entirety.

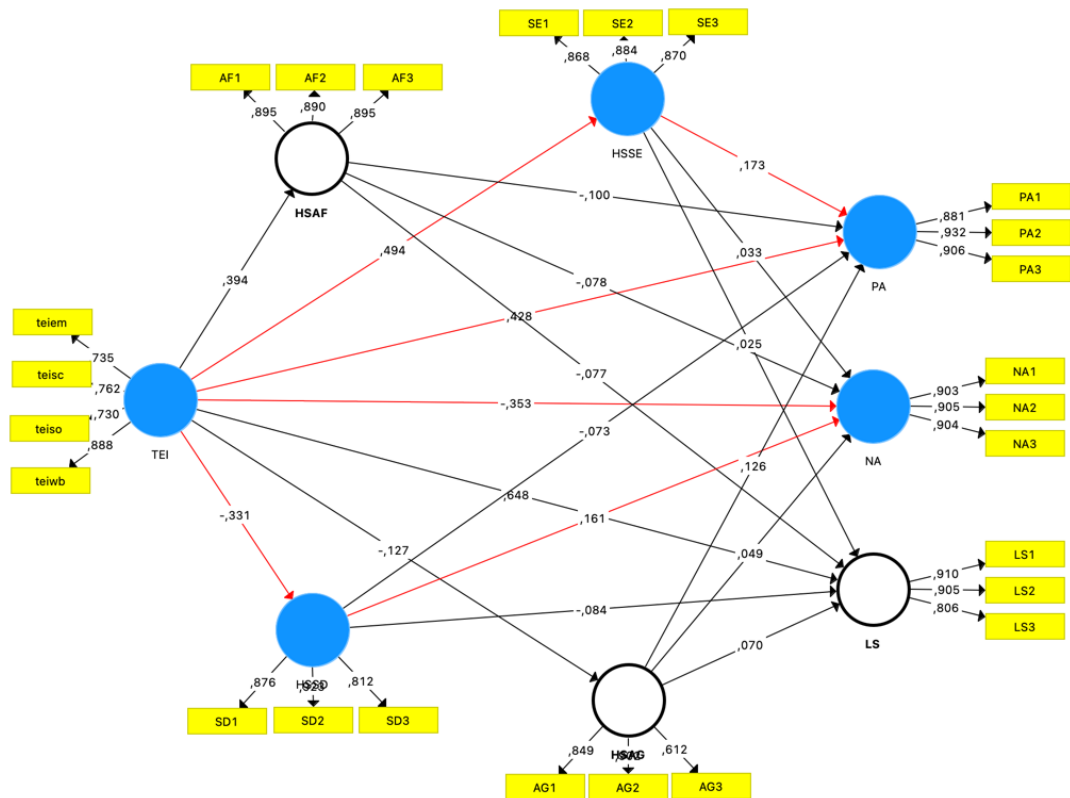


Figure 6-2 Mediation model of the relations among trait EI, humour styles and hedonic well-being.

Note: red lines indicate significant paths, and black lines indicate nonsignificant paths. Blue nodes link significant paths. Standardized coefficients are reported. Paths coefficient estimates are significant at the $p < .05$ level.

6.3.2.4.2 The mediating effects of humour styles on the relationship between trait EI and eudaimonic well-being (Model-PWB)

The measurement model consists of 6 latent factors (trait EI, affiliative humour, self-enhancing humour, aggressive humour, self-defeating humour, and psychological well-being) and 19 observed variables. The table illustrating the indicators of the outer measurement model can be found in Appendix 15. All variables' values of Cronbach's alpha, CR, AVE, and rho_A are fulfilled. All factor

loadings of indicators for the latent variables in the model were higher than 0.7. In this model, all the latent constructs were properly estimated by the corresponding indicators.

Results of discriminant validity showed that the values of Fornell-Larcker Criterion met the criteria. However, the value of HTMT (table 6-12) for psychological well-being was higher than 0.9, indicating that there might be overlap between trait EI and psychological well-being. This result suggested that the model of PWB was unsuccessful. In order to further confirm discriminant validity, cross-loadings were assessed to make sure that no indicator is incorrectly assigned to a wrong factor. The cross-loadings of all factors met the criteria. All indicators of structured model met the criteria. The value of SRMR is 0.078 met the criteria (Hu and Bentler, 1998). However, as described in Chapter 4, a satisfied PLS-SEM should fulfill all model fit criteria. The value of HTMT for psychological well-being was higher than 0.9, suggesting discriminant validity was not present. Thus, the model for Model-PWB was not successful. Tables for presenting Fornell-Larcker Criterion, cross-loadings, and indicators of structured model can be found in Appendix 15.

Table 6-12 Discriminant validity (Heterotrait-Monotrait Ratio (HTMT)) for Model-PWB.

Constructs	HSAF	HSAG	HSSD	HSSE	PWB	TEI
HSAF						
HSAG	.292					

HSSD	.276	.399			
HSSE	.607	.203	.197		
PWB	.428	.131	.400	.527	
TEI	.475	.197	.370	.586	1.041

Note: HSAF = affiliative humour; HSSE = self-enhancing humour; HSAG = aggressive humour; HSSD = self-defeating humour; PA = positive affect; NA = negative affect; LS = life satisfaction; TEI = trait emotional intelligence.

6.3.2.4.3 The mediating effects of humour styles on the relationship between trait EI and psychological distress (Model-MD)

The measurement model consists of 7 latent factors (trait EI, affiliative humour, self-enhancing humour, aggressive humour, self-defeating humour, anxiety, and depression) and 22 observed variables. Table 6-13 illustrates the indicators used for the outer measurement model. All variables' values of Cronbach's alpha, CR, AVE, and rho_A are fulfilled. All factor loadings of indicators for the latent variables in the model should be higher than 0.7. If the values of few items are slightly lower than 0.7 (Sarstedt *et al.*, 2014), they also can be accepted if other indicators such as CR, AVE, and Cronbach's alpha are meeting the criteria (Hair *et al.*, 2016). All the latent constructs were properly estimated by the corresponding indicators.

Table 6-13 Indicators of measurement model (Model-MD). Results of indicator loadings, internal consistency reliability, and convergent validity.

Constructs	Items	Outer loading	α	rho_A	CR	AVE
Trait EI	Emotionality	.720	.787	.828	.861	.609
	Self-control	.786				
	Sociability	.717				
	Well-being	.887				
Affiliative humour	AF1	.896	.874	.877	.922	.799
	AF2	.886				
	AF3	.898				
Self-enhancing humour	SE1	.859	.847	.879	.906	.762
	SE2	.898				
	SE3	.863				
Aggressive humour	AG1	.815	.753	.892	.833	.631
	AG2	.928				
	AG3	.606				
Self-defeating humour	SD1	.878	.846	.898	.905	.761
	SD2	.914				
	SD3	.824				
Anxiety	GAD1	.929	.888	.898	.930	.817
	GAD2	.912				
	GAD3	.869				
Depression	PHQ1	.905	.875	.887	.923	.799
	PHQ2	.912				
	PHQ3	.863				

Note: AF = affiliative humour; SE = self-enhancing humour; AG = aggressive humour; SD = self-defeating humour; GAD = generalized anxiety disorder - 7; PHQ

= *patient health questionnaire - 9*; *CR = composite reliability*; *AVE = average variance extracted*; *a = Cronbach's Alpha*.

All indicators of discriminant validity met the criteria. Tables can be found in Appendix 16.

Table 6-14 shows that all indicators of structured model met the criteria. The value of SRMR is .073 indicating a good fit (Hu and Bentler, 1998).

Table 6-14 Indicators of structured model (Model-MD). Results of variance inflation factor, coefficient of determination, effect size, Q^2 value, and standardized root mean square residual.

Constructs	R^2	f^2	Q^2	VIF	SRMR
GAD	.334	.254	.267		.073
HSAF	.146	.172	.115	1.569	
HSAG	.017	.018	.007	1.166	
HSSD	.112	.126	.079	1.504	
HSSE	.247	.329	.182	1.752	
PHQ	.436	.275	.340		
TEI				1.928	

Note: HSAF = affiliative humour; HSSE = self-enhancing humour; HSAG = aggressive humour; HSSD = self-defeating humour; GAD = generalized anxiety disorder - 7; PHQ = patient health questionnaire - 9; TEI = trait emotional intelligence; VIF = variance inflation factor; SRMR = standardized root mean square residual.

A multiple mediation model with trait EI as the independent variable, four mediators (affiliative humour, self-enhancing humour, aggressive humour, and self-defeating humour), and psychological distress (anxiety and depression) as dependent variables showed an acceptable fit to the data as presented above. A mediation analysis was performed to determine which humour styles mediated the relationship between trait EI and mental distress. A Bootstrapping procedure was used to analyse the significance of mediation analysis (MacKinnon, Lockwood and Williams, 2004). A resampling of 5000 was used in the current study.

Table 6-15 and table 6-16 illustrate the results of direct and indirect effects of the structural model. The total effect of trait EI on anxiety was significant ($\beta = -.549$, $p < .001$). The indirect effect of trait EI on anxiety through self-defeating humour was significant ($\beta = -.037$, $p < .05$). Higher trait EI decreased the use of self-defeating humour ($\beta = -.334$, $p < .001$), which in turn reduced the positive effect of self-defeating humour on anxiety ($\beta = .109$, $p < .05$). Results of bootstrapping confirmed a complementary partial mediation from trait EI through self-defeating humour to anxiety, indicating that self-defeating humour partially explained the relationship between trait EI and anxiety. The indirect effect of trait EI on anxiety through affiliative humour was significant ($\beta = .051$, $p < .05$). A competitive partial mediation model was established between trait EI, affiliative humour, and anxiety, indicating that affiliative humour might increase or reduce the magnitude of the relationship (Carrión, Nitzl and Roldán, 2017).

The total effect of trait EI on depression was significant ($\beta = -.609, p < .001$). The indirect effect of trait EI on depression through self-defeating humour was significant ($\beta = -.086, p < .001$). Higher trait EI decreased the use of self-defeating humour ($\beta = -.334, p < .001$), which in turn reduced the positive effect of self-defeating humour on negative effect ($\beta = .257, p < .001$). A complementary partial mediation was found from trait EI through self-defeating humour to depression, suggesting that self-defeating humour partially explained the negative effect of trait EI on depression.

Table 6-15 PLS-SEM: significance of structural paths (direct effects) for Model-MD.

Structural paths	B-value	T value	CI (Bias Corrected)		P-value	Outcomes
			2.5%	97.5%		
HSAF -> GAD	.134	2.550	.030	.234	.011*	Supported
HSAF -> PHQ	.083	1.766	-.008	.178	.077	Not supported
HSAG -> GAD	-.096	1.975	-.185	.001	.048*	Supported
HSAG -> PHQ	-.084	1.780	-.180	.003	.075	Not supported
HSSD -> GAD	.109	2.385	.022	.201	.017*	Supported
HSSD -> PHQ	.257	6.306	.180	.341	.000**	Supported
HSSE -> GAD	-.010	.199	-.105	.096	.842	Not supported
HSSE -> PHQ	-.037	.888	-.117	.047	.375	Not supported

TEI -> GAD	-.572	12.552	-.661	-.483	.000**	Supported
TEI -> HSAF	.383	9.005	.288	.460	.000**	Supported
TEI -> HSAG	-.132	2.145	-.203	.120	.032*	Supported
TEI -> HSSD	-.334	8.495	-.409	-.254	.000**	Supported
TEI -> HSSE	.497	14.612	.425	.559	.000**	Supported
TEI -> PHQ	-.547	12.715	-.632	-.466	.000**	Supported

Note: HSAF = affiliative humour; HSSE = self-enhancing humour; HSAG = aggressive humour; HSSD = self-defeating humour; GAD = generalized anxiety disorder - 7; PHQ = patient health questionnaire - 9; TEI = trait emotional intelligence; CI = confidence interval; * $p < .05$, ** $p < .001$.

Table 6-16 PLS-SEM: significance of structural paths (indirect effects) for Model-MD.

Structural paths	Indirect effect	T value	P-value	CI (Bias Corrected)		Interpretation
				2.5%	97.5%	
TEI -> HSSE -> GAD	-.005	.198	.843	-.052	.049	Not supported
TEI -> HSSD -> PHQ	-.086	5.003	.000**	-.123	-.056	Supported
TEI -> HSSE -> PHQ	-.018	.880	.379	-.058	.023	Not supported
TEI -> HSAG -> GAD	.013	1.467	.142	-.004	.031	Not supported
TEI -> HSAF -> PHQ	.032	1.675	.094	-.003	.073	Not supported
TEI -> HSAG ->	.011	1.385	.166	-.004	.029	Not

PHQ						supported
TEI -> HSAF -> GAD	.051	2.411	.016*	.012	.096	Supported
TEI -> HSSD -> GAD	-.037	2.224	.026*	-.073	-.007	Supported

*Note: HSAF = affiliative humour; HSSE = self-enhancing humour; HSAG = aggressive humour; HSSD = self-defeating humour; GAD = generalized anxiety disorder - 7; PHQ = patient health questionnaire - 9; TEI = trait emotional intelligence; CI = confidence interval; * $p < .05$, ** $p < .001$.*

Overall, the relationship between trait EI and anxiety was mediated by self-defeating humour (95% CI = [-.073, -.007]) and affiliative humour (95% CI = [.012, .096]). The relationship between trait EI and depression was mediated by self-defeating humour (95% CI = [-.123, -.056]). Humour styles partially mediated the link from trait EI to depression. Figure 6-3 illustrates the mediation model.

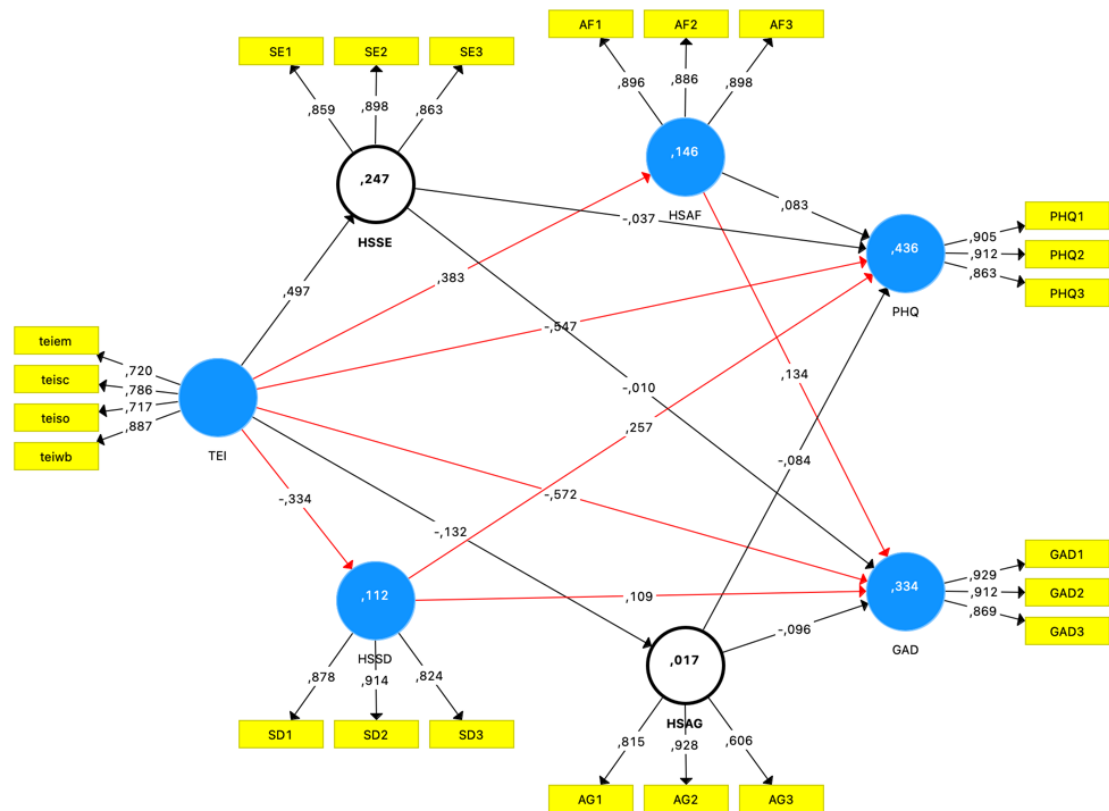


Figure 6-3 Mediation model of the relations among trait EI, humour styles and mental distress.

Note: red lines indicate significant paths, and black lines indicate nonsignificant paths. Blue nodes links significant paths. Standardized coefficients are reported. Paths coefficient estimates are significant at the $p < .05$ level.

6.4 Discussion

6.4.1 Summary

The purpose of the quantitative study was to explore the relationship between trait EI and psychological well-being, and the mediating role of humour styles in such a link. The study involved applying seven online questionnaires to university

students in Scotland, with a total of 536 participants. The primary results revealed that: (1) for psychological well-being, intrapersonal humour styles (self-enhancing and self-defeating humour styles) partially mediated the relationship between trait EI and hedonic well-being (positive and negative affects). And (2) for psychological distress, self-defeating and affiliative humour styles partially mediated the link between trait EI and anxiety; self-defeating humour also partially mediated the relationship between trait EI and depression. The secondary results estimated (1) the prevalence of depression and anxiety among university students in Scotland; and (2) levels of well-being within the students. I'm now going to discuss the current findings, and compare them with previous studies. Strength, limitation, and future directions are also discussed.

6.4.2 Prevalence of psychological distress

The prevalence risk of depression (PHQ-9) in the current study was 37.9%, as out of 536 students, 203 experienced depression in the past two weeks. For anxiety (GAD-7), it was 23.7%, as 127 of 536 students experienced anxiety in the same period. Systematic and meta-analytic studies suggest that the prevalence of depression or depressive symptoms varies across studies from 10% to 85% with a weighted mean of 30.6 % among university students (Prinz *et al.*, 2012; Ibrahim *et al.*, 2013). Regarding anxiety, it is suggested that the prevalence among university students ranges between 7.7% and 65.5% (Hope and Henderson, 2014). Empirical studies reported the prevalence of anxiety was 7.2% in the general population and

42.1% in university students in the UK (Martín-Merino *et al.*, 2009; Jenkins *et al.*, 2021). Students in the present study experienced rates of depression and anxiety that are slightly higher than those reported in the general population and comparable to the university population. These findings are consistent with previous studies that university students represent a high-risk group for the experience of psychological distress (Ibrahim *et al.*, 2013; Jenkins *et al.*, 2021). It is also suggested that approximately one-third of university students suffer from ongoing mental health problems worldwide (Ibrahim *et al.*, 2013; Auerbach *et al.*, 2018).

The influence of the other demographic variables on psychological distress was investigated. Consistent with previous studies, women in the studied sample had a higher risk of depression and anxiety than men (e.g., Kessler *et al.*, 2003; Jenkins *et al.*, 2021). Regarding education level, undergraduate students experienced the highest levels of depression and anxiety, whereas postgraduate research students experienced lowest distress. It is well-documented that lower educational levels are significantly associated with generalized anxiety disorder (GAD) worldwide (Ruscio *et al.*, 2017), and each additional year of education has a strong and significant protective effect for depression (Crespo, López-Noval and Mira, 2014). However, it was an unexpected result that there was no significant difference between home and international students, regarding both depression and anxiety prevalence. I expected to find higher level of distress in international students than home students. This might be due to almost all international students in the

study being postgraduate students. They had a relatively higher educational level than home students. In addition, emerging adults who are willing to live and study abroad might be more capable of managing their emotions and adapting to their surroundings, leading to less psychological distress. Future studies are needed to explore this aspect further.

6.4.3 Levels of psychological well-being

The level of hedonic well-being is predicted by the scores of positive affect (PA), negative affect (NA), and life satisfaction (LS). The mean scores of the general population in the original study for PA is 33.3 ($SD = 7.2$) and for NA is 17.4 ($SD = 6.2$; Watson, Clark and Tellegen, 1988). The score of PA in the current study was 29.9, and NA was 21.2. The present participants experienced less positive affect and more negative affect than the general population, but still lie within the normal range. Empirical studies report that scores of PA and NA in the university population are mixed, such as 22.4 for PA and 26.8 for NA (Kong *et al.*, 2019), and 32.3 for PA and 24.8 for NA (Asif *et al.*, 2022).

Regarding life satisfaction, the mean score of current study participants was 23.7, with the cut-off between 20 to 24, representing an average score for life satisfaction (see *Understanding Scores on the Satisfaction with Life Scale*, Diener, 2006). This suggested that the majority of students are generally satisfied with their current life, but there are some areas where they intend to make some

improvement (Diener *et al.*, 1985).

The level of eudaimonic well-being is predicted by the score in the psychological well-being questionnaire (PWB). The mean score of the current sample was 176.78. There are no specific scores or cut-points for defining high or low psychological well-being (Ryff and Keyes, 1995).

Male students scored higher than female on positive affect, which is congruent with the result about psychological distress. International students had higher scores on eudaimonic well-being than home students. Meanwhile, postgraduate research students had higher scores on eudaimonic well-being and lower scores on negative affect than both undergraduate and postgraduate taught students. These findings may be because there is a large overlap between international students and postgraduate students, who are more likely to be more mature than undergraduates from an age, life experience, and level of education perspective. Mature students with a high level of education may be more able to overcome difficulties and resolve problems, have a clearer vision of the present and future, and have a more purposive life goal, than undergraduates.

6.4.4 The role of humour styles

6.4.4.1 Between emotional intelligence and hedonic well-being

Consistent with previous studies, emotionally intelligent people were found to report more positive affect, less negative affect, and better life satisfaction (e.g., Petrides *et al.*, 2007; Wang *et al.*, 2019). Individuals with high trait EI were more able to perceive their own and others' emotions, to manage emotions and combine emotional experience with thoughts and actions to better adapt to different contexts around them. These features are considered to be effective in protecting people from stress and negative events. Trait EI, therefore, can be seen as a protective factor for higher hedonic well-being. Similarly, adaptive humour styles were found to be related to increased well-being, whereas maladaptive humour styles were related to decreased well-being. Individuals engaging in adaptive humour styles tended to have positive perspectives on stressful events, and to share benign mirth to strengthen relationships. Therefore, they were more capable of taking advantage of the effect of humour on their well-being. By contrast, individuals preferring maladaptive humour were prone to do funny things at the expense of themselves, and to use disparaging humour to alienate others. These characteristics were detrimental to hedonic well-being. These findings are consistent with previous studies regarding the associations between humour and hedonic well-being (e.g., Greven *et al.*, 2008; Wang *et al.*, 2019). In addition, trait EI was found to be associated with greater use of adaptive humour styles, and with less use of maladaptive humour. These findings agree with the results of the systematic review (Chapter 5) of the thesis.

The PLS-SEM and mediation analyses found that self-directed humour styles (self-

enhancing and self-defeating) partially mediated the relationship between trait EI and affective aspects of hedonic well-being, which supported the AMM (Zeidner *et al.*, 2012). The link between trait EI and positive affect was found to be partially mediated by self-enhancing humour. Meanwhile, self-defeating humour partially mediated the link between trait EI and negative affect. These suggest that high trait EI might facilitate an increase in engaging in self-enhancing humour and a decrease in self-defeating humour, which in turn improved participants affective well-being. Self-directed humour tended to serve as a mechanism through which trait EI benefits affective perspectives of hedonic well-being. That is, people with high trait EI experience more positive emotions because they prefer to maintain a positive outlook on life, viewing adversity from a humorous perspective. In contrast, those with low trait EI may experience greater negative emotions because they tend to avoid interacting with others and leave themselves feeling socially isolated. This finding was also in accordance with a previous study which reported that self-directed humour styles are more strongly associated with emotional well-being than are the other-directed humour styles (affiliative and aggressive) (Cann, Stilwell and Taku, 2010).

However, inconsistent with previous findings (Wang *et al.*, 2019; Huang *et al.*, 2019), humour styles did not explain the link between trait EI and the cognitive component of hedonic well-being, namely, life satisfaction, which reflects individuals' overall appraisal of life experiences. This suggests that humour styles are less likely to enhance their appraisal of life, such as social networks,

performance in an important role, and satisfaction with the self, which are the factors that most influence individuals' experience of life satisfaction (Diener, Lucas and Oishi, 2002). Further research is needed to test this EI - humour styles - life satisfaction relationship. The other-directed humour styles, especially for affiliative humour, did not play a role in explaining the association between trait EI and hedonic well-being in the present study. This suggests that benefits from relationships with others may not definitely link to increased affective experience and global life satisfaction. Previous research findings about this were mixed (Kuiper and McHale, 2009; Jovanovic, 2011; Wang *et al.*, 2019), the current finding was consistent with Wang *et al.* (2019).

6.4.4.2 Between emotional intelligence and eudaimonic well-being

As anticipated, an increase in trait EI was found to be associated with enhancement in eudaimonic well-being. Emotionally intelligent people are not only more able to manage emotions and adapt to their surroundings, but are also more capable of feeling that what they are doing has meaning and purpose. Eudaimonic well-being explicitly concerns the self-realization and development of individuals, which involves a stronger cognitive component than the emotional perspective. All four humour styles were also found to be associated with better eudaimonic well-being in the current study, which was consistent with previous findings (e.g., Martin *et al.*, 2003).

However, the PLS-SEM modelling for trait EI - humour styles - eudaimonic well-being was unsuccessful, suggesting humour styles may not help to explain the association between trait EI and eudaimonic well-being in the current sample. This result corresponds to the above finding that humour styles did not mediate the relationship between EI and life satisfaction. These findings suggested that emotionally intelligent people facilitate their use of adaptive humour and undermine their use of maladaptive humour in order to achieve emotional rewards, but these rewards cannot enhance their feelings of meaning and purpose. Humour styles probably contribute more to affective well-being than cognitive well-being, meaning and purpose.

6.4.4.3 Between emotional intelligence and psychological distress

In line with a previous meta-analysis (Martins *et al.*, 2010), an increase in trait EI was found to be related to decreased psychological distress (anxiety and depression). Similarly, more use of adaptive humour styles was related to less anxiety and depression, whereas more use of maladaptive humour was linked to more anxiety and depression. These findings were also in accordance with previous studies (e.g., Martin *et al.*, 2003).

The PLS-SEM and multiple mediation analyses found that a self-defeating humour style partially explained the link between trait EI and anxiety, and depression, which are consistent with the AMM (Zeidner *et al.*, 2012). People with high trait

EI are more likely to reduce the use of self-defeating humour, which decreases the level of anxiety and depression. As a self-directed humour style, self-defeating humour is deemed to be more related to personal emotions than other-directed humour. People who engage in self-defeating humour tend to ingratiate themselves to others by making fun of their own weaknesses. They engage in humour as a strategy to avoid facing problems and managing negative emotions (Stieger, Formann and Burger, 2011). Additionally, they prefer to use humour as a method of refusing to solve problems, rather than facilitating effective coping. Such self-disparaging and avoidant behaviours are usually associated with anxiety and depression (Martin *et al.*, 2003; Martin and Ford, 2018b). This finding suggests that reducing the use of self-defeating humour might be helpful for addressing distress. Affiliative humour was found to be helpful in explaining the association between trait EI and anxiety. Those who use affiliative humour to achieve interpersonal rewards such as enriched social network, tend to tell jokes in order to entertain others and to reduce interpersonal tensions. This process is related to better interpersonal intimacy and conflict resolution (Martin *et al.*, 2003; Campbell, Martin and Ward, 2008). In the current study, self-enhancing humour played a role in the trait EI - well-being relationship but not trait EI - distress relationship. This suggests that, compared with social rewards, positive perspectives and intrapersonal rewards may be less helpful in reducing anxiety and depression. This result might be because enhancing well-being and reducing distress are two different processes. Researchers have found that high scores on distress are not incompatible with high scores on well-being, thus distress and

well-being could be two correlated but globally independent constructs (e.g., Massé *et al.*, 1998; Keyes, 2005; Hides *et al.*, 2020).

As expected, aggressive humour did not play a role in the relationship between trait EI and both psychological well-being and psychological distress. These findings are consistent with previous studies (Wang *et al.*, 2019; Greven *et al.*, 2008), suggesting aggressive humour was less likely to be associated with psychological well-being.

6.4.5 Contribution to the literature

As described previously, three studies that have examined the mediating role of humour in this relationship (Greven *et al.*, 2008; Wang *et al.*, 2019; Huang and Lee, 2019). However, none of them studied eudaimonic well-being, distress, or a specific population. The earliest study about the mediation relationship, by Greven *et al.* (2008), included personality as the independent variable, and examined trait EI and humour styles as two sequential mediators between personality and general health. The mediation relationship explored by this study is not the same as my study. Findings of the three studies are mixed, and some are inconsistent with the theoretical hypothesis, for instance, affiliative humour does not play a role between trait EI and subjective well-being. The present quantitative study simultaneously explores the role of humour in the relationship between trait EI and hedonic well-being, eudaimonic well-being, and

psychological distress (anxiety and depression) separately among university students. It also provides evidence about the commonalities and differences between the hedonic and eudaimonic well-being constructs. These results add further depth to the literature about the AMM which regards well-being and distress separately. The results from this study regarding humour also support the idea that humour should be conceptualised as a multidimensional construct.

6.4.6 Strengths and limitations

Our sample was deliberately drawn from a university population in Scotland, involving local students and international students from Europe, America, and Asia. Therefore, the current findings have generalisability to other cultural groups. Second, this quantitative study tested hedonic well-being, eudaimonic well-being, and distress separately, which improved the limitations identified in the previous studies.

Despite the above contributions, there are some limitations to the present study that point to directions for future research. First, the cross-sectional design of the current study means causal inferences cannot be made. Future researchers should adopt a longitudinal design to investigate the causal relationships between these variables. Second, the current data were collected using self-report measures, which may cause misleading correlations since the results might be contaminated by common method bias (Podsakoff *et al.*, 2003). Statistical findings might be

attributed to the shared measurement method rather than to the constructs that the measures assessed (Bagozzi, Yi and Phillips, 1991). Common method bias may appear from a shared measurement context, a shared rater, or a shared item context (Podsakoff *et al.*, 2003). Although it is argued that common method bias may not necessarily lead to inflated estimates (Conway and Lance, 2010), further studies should consider collecting data from diverse sources, such as other-rated measures. Third, both trait EI and humour styles overlap to some extent with major personality traits (Martin *et al.*, 2003; Siegling, Furnham and Petrides, 2015), thus personality traits might confound the results. However, evidence showed that TEIQue consistently accounts for incremental variance in the criteria relating to many areas over the basic dimensions of personality (Andrei *et al.*, 2016; Di Fabio and Kenny, 2019). For HSQ, there is also evidence of demonstrated incremental validity of self-enhancing, affiliative and self-defeating humour styles over personality in happiness and psychological wellbeing (Páez, Mendiburo Seguel and Martínez-Sánchez, 2013). Additional studies are necessary to further investigate these issues.

In addition, there were practical constraints on the data collection for the quantitative study and changes were required to adapt to the constraints. One of the original aims of the quantitative study was to conduct a multiple-group analysis to examine whether the mediation relationship would differ among international students and home students. However, I was unable to recruit enough international students despite three cycles of questionnaire distributions

in three months. The final sample consisted of 179 international students and 357 home students. When one subgroup is more than 50% larger in size than the other subgroup, this large difference tends to lead to bias in the results of the statistical test of multiple-group analysis (Matthews, 2017). Therefore, the comparison was not conducted in the quantitative study. Instead, I invited international and home students to participate in a sequential semi-structured interview and gained insight into nuanced differences among students with different characteristics.

6.5 Conclusion

In summary, this quantitative study attempted to substantiate the humour styles and AMM in one study to explain the relationship between trait EI and psychological well-being, and makes the attempt to explain this link regarding well-being and distress brought together in one study, and improving limitations identified in previous studies. This was based on a cross-cultural sample of home and international university students. These findings provide support for five different pathways for this model: the mediating role of self-enhancing humour and self-defeating humour for affective well-being, and the mediating role of self-defeating humour and affiliative humour for depression and anxiety. In addition, the study describes the prevalence of depression and anxiety among university students in Scotland; higher than the general population but comparable to university students. The findings also investigated levels of well-being of the students, which indicated that mature students may have better psychological

well-being.

6.6 Chapter summary

This chapter presented the methods, results, and discussion about the quantitative component of the stage 2 mixed methods study, which investigated the relationship between trait EI, humour styles, and psychological well-being among university students. It used a PLS-SEM and mediation analysis to explain one of the mechanisms underlying this relationship, that is, humour styles partially mediated the EI - psychological well-being link. The study also estimated the levels of well-being, and prevalence of depression and anxiety of this sample.

Chapter 7 What is the role of humour in psychological well-being among university students? (QUAL)

7.1 Introduction

As reported in Chapter 6, the quantitative study has examined the mediating effect of humour styles on the relationship between trait EI and psychological well-being, which supported the AMM (Zeidner *et al.*, 2012). Humour could be suggested as a process by which EI influences psychological life outcomes. In this chapter, the perceptions of some of those who took part in the quantitative study, on psychological well-being in daily life are explored. A qualitative approach with semi-structured interviews was adopted to explore the views and experiences of a purposive sample of students. The aim of the interviews was to gain an in-depth understanding of the role of humour in psychological well-being among university students. To recap, mental well-being refers to positive affect, life satisfaction, and psychological well-being as described by Ryff (1989). Higher scores on the three scales (the Positive Affect, the Life Satisfaction Scale, and the Scale of Psychological Well-being) meant better well-being status in this study. Mental distress refers to negative affect, depression, and anxiety, lower scores on the three scales (the Negative Affect, the PHQ-9, and the GAD-7) meant less distress in the survey. I use the term “psychological well-being” to denote a perspective that describes not only the absence of distress (less distress) but also the presence

of feeling good and functioning effectively (more well-being) (Seligman, 2002).

The study was undertaken from February to July 2020 at the University of Glasgow. Students participating in the previous study were invited to take part in a face-to-face or online interview. This chapter reports the methods, pilot study, the full study results, and discussion.

7.2 Methods

7.2.1 Ethics process and approvals

Ethical approval for the interviews was obtained through the MVLS ethics committee (Project No: 200180031) at the University of Glasgow on 5th December 2018 (Appendix 1). Careful consideration was given to data collection, data storage and presentation of results. To ensure participant confidentiality, all personal identifiers were removed from the transcripts of the interviews.

7.2.2 Participants and recruitment

7.2.2.1 Sampling frame for participant recruitment

The concept of Information Power was considered to determine the sample size of the study (Malterud, Siersma and Guassora, 2016). Information power values

the information richness of the sample and to what extent it can meet the aims and requirements of the study (Braun and Clarke, 2022, p.28). In order to gain in-depth understanding of the nature and phenomena, qualitative samples are usually small in size (Ritchie *et al.*, 2013). Ritchie and colleagues (2013) suggested reasons to explain why samples are relatively small: there will be a point, when additional samples may only obtain repeated evidence, if the data are appropriately analysed. Furthermore, the analytic map requires phenomena to appear only once, information about prevalence or frequency are not the interest of qualitative studies. Information from qualitative research is usually intensive and rich in detail, and requires a reasonably small sample to enable thorough analysis of each data unit (Ritchie *et al.*, 2013). Clarke and Braun (2013) recommended that 15-20 participants were preferable for interviews conducted in a PhD/larger project (with data using thematic analysis as a part of the full project). In addition, the minimum sample size recommendations regarding qualitative interviews as a part of a mixed methods study are 6-9 participants (Krueger, Casey and NetLibrary, 2000), 6-10 participants (Morgan, 1997; Langford, Schoenfeld and Izzo, 2002), or 6-12 participants (Johnson and Christensen, 2008).

In order to gain a wide range of views to help answer the research question, a sampling frame was developed based on the key findings of the quantitative study in Phase 2. A 2 x 2 table of students that scored high- and low- on EI, and their status as international or UK/EU students was developed. Table 7-1 shows the range of participants recruited.

Table 7-1 Sampling frame for participant recruitment into the qualitative study.

	International student		UK/EU student	
	MD-high score	MW-high score	MD-high score	MW-high score
High EI	A1	A3	C1	C3
	MD-low score	MW-low score	MD-low score	MW-low score
	A2	A4	C2	C4
Low EI	MD-high score	MW-high score	MD-high score	MW-high score
	B1	B3	D1	D3
	MD-low score	MW-low score	MD-low score	MW-low score
	B2	B4	D2	D4
Total				16

Note: MD = mental distress; MW = mental well-being.

The focus on UK/EU and international students links to one of the original aims of the thesis, that is, to explore whether the proposed mediation relationship differs between UK/EU and international students. In addition, it was unexpected that there was no significant difference between UK/EU and international students regarding both depression and anxiety prevalence in the quantitative study, which was different from the previous finding that international students may face additional pressures than home students (Zhou *et al.*, 2008; Forbes-Mewett and Sawyer, 2016). As the sequential component of the mixed methods study, the results from the qualitative study might help us interpret the unexpected quantitative results about UK/EU and international students. Both EI and psychological well-being are constructs of interest of the thesis. Participants were chosen based on their EI scores because of their associations with psychological well-being and humour behaviours found in the quantitative study and previous literature. For example, humour is situational, participants with high, low, and

medium scores of EI may provide a range of views regarding the different ways of using humour in a diverse cultural context in the university. Participants could also provide nuanced information about how they manage psychological well-being in this context. Participants with different levels of well-being and distress may provide different factors which could impact on their psychological well-being.

Participants ranked based on the percentage of trait EI scores in the top 25% and bottom 25% were considered respectively to have high- and low- EI. The cells cover high- and low- mental well-being, and high- and low- mental distress. Participants were considered to have high (poor) and low (good) mental distress and ranked in the top 25% and bottom 25% based on the percentage scores in PHQ-9, GAD-7, and the Negative Affect Scale. Participants were considered to have high and low mental well-being and ranked in the top 25% and bottom 25% based on the percentage scores for positive affect, life satisfaction, and psychological well-being according to the Positive Affect Scale, the Scale of Life Satisfaction, and the Scale of Psychological Well-being. The target number of participants in each cell was at least one. The participant in each cell was given a unique code (e.g., A1 = the international student with high scores of EI and distress indicators) to ensure anonymity. Sixteen participants were recruited in total.

7.2.2.2 Recruitment of participants

For the pilot study, participants were a convenience sample of students meeting

the eligibility criteria who were known to the researcher (RX), and the supervisors (AEW and JM). For the full study, potential participants were identified based on the sampling frame. They were recruited by an email invitation (Appendix 5). In the Phase 2 quantitative study, participants were asked to indicate if they would be willing to take part in a follow up qualitative interview study. Participants were purposively sampled according to the sampling frame and contacted by RX. Email addresses were voluntarily provided by participants who had taken part in the quantitative survey. All participants were informed about the purpose of the qualitative study and data protection procedures. The Participant Information Sheet and Consent Form (Appendices 2 and 3) were emailed to participants prior to the interview appointment to make sure that they had sufficient time to read the information and to ask any questions about participating in the study. Each participant was assigned an ID number shown in Table 7-1. One cell (D1, UK/EU student with high EI and low mental health) was empty as no eligible potential participant opted to take part in the interview. In another cell, two eligible participants were recruited because they responded to the invitation and opted to participate (B2-1 and B2-2, international students with low EI and less mental distress).

7.2.3 Data collection

For the pilot study, five face-to-face interviews were conducted. AEW and JM reviewed the recordings and discussed small changes to the interview topic guide.

For the full study, sixteen interviews were conducted between February and July 2020. Nine interviews were conducted face-to-face and seven were conducted via online video call. Online video interviews became necessary because of the circumstances of the Covid-19 pandemic. The face-to-face interviews were held at a venue of their choice, either at the University of Glasgow department of General Practice and Primary Care (GPPC) (n=6), at home (n=2), or at the University Library (n=1). I conducted all interviews. I introduced the purpose of the study to the participant and sought signed consent to take part at the start of the interview. Semi-structured interviews were conducted using a topic guide (Appendix 7) developed from the findings of Phases 1 and 2 study, the systematic review and quantitative study. Interviews were audio-recorded and lasted between 18 and 61 minutes; average 30 minutes. Two interviews were in Chinese since participants required to use their native language to provide in-depth information. I translated the Chinese transcript to English.

7.2.4 Data analysis

Interviews conducted in English were transcribed verbatim by a professional transcription company contracted by the University of Glasgow. There might have been English language grammatical errors because of spoken English, as they were transcribed exactly as recorded. The transcripts were checked by me for inconsistencies against the recordings. Each interviewee was given a unique code corresponding to the code of each cell in the sampling frame. QSR International

NVIVO 12 (QSR International Pty Ltd., 2020) qualitative data analysis software was utilized for data analysis.

7.2.4.1 Thematic analysis

A primarily semantic data-derived inductive thematic analysis underpinned by a critical realist view was undertaken. This is an iterative and recursive process followed Braun and Clarke's six-phase method for thematic analysis (2022). These phases were familiarising oneself with the data, coding, generating initial themes, developing and reviewing themes, refining, defining and naming themes, and writing up.

Phase 1 familiarisation

The transcripts of the interviews were re-read alongside the recordings to check for any mistakes and to achieve familiarisation with the data. The key messages of the interviews including characteristics of the interviewee (e.g., age, sex, EI scores, and mental health scores) and field notes taken while the interviews were conducted were summarized to develop a sense of the overall dataset. Notes was also used to facilitate critical engagement with the data and the process of meaning-making. Questions were asked in order to gain deep familiarity with the content of each transcript. For example, "why some international students don't mind not being able to blend with local students?" "what are my views on blending

with home students?” and “what is my story?” Thoughts about such questions were recorded on a notebook. Some random thoughts were recorded on my cellphone when they occurred.

Phase 2 coding

The initial inductive (data-driven) coding was conducted to capture information that would help answer the research question. Each interview transcript was read line by line and potential codes were generated. Some codes were grouped based on similar content. For example, “some exercise, like I walk most places” and “exercise has always been a big one for me” were coded as “exercise”. Not every single code could be grouped with other similar codes. Some codes stood alone and were labelled based on their content. The coding of the first four interviews was reviewed by AEW and JM, to iteratively refine my coding. Twelve subsequent transcripts were coded by me and reviewed by AEW and JM. Each transcript was coded at least twice. Coding was done using the software package NVIVO 12 (QSR International Pty Ltd., 2020).

Phase 3 generating initial themes

Themes were constructed based on a deep understanding of the data through familiarisation and coding. The research question guided this active process of pattern and relationship formation. The initial themes were identified by

clustering the potentially related codes, and exploring the initial patterns. Each pattern gathered codes sharing a broad meaning. Initial themes captured different aspects of an idea; codes captured a single aspect of this idea. An early thematic map (Appendix 18) was developed at this stage to aid organising central concepts of themes. Both semantic and latent candidate themes were generated at this stage. This phase was done by me.

Phase 4 developing and reviewing themes

In order to answer the research question meaningfully and distinctively, the candidate themes developed in Phase 3 were further shaped or rejected in the process of reviewing. A balance between ensuring themes were distinct from each other and were related to each other was developed in this process. Meanwhile, the finalised thematic map was established based on the review process. Contradictory meanings were identified as a theme at this stage, which contributed to one aspect of the central meaning of psychological well-being. Several subthemes were generated in this process. This phase was done by me and discussed with AEW and JM.

Phase 5 refining, defining, and naming themes

The central ideas and meanings of each theme were summarised as theme definitions. The definition for each theme contains the central organising concept

of each theme, the boundary of each theme, the uniqueness of each theme, and the contribution of each theme to the overall research aim (Braun and Clarke, 2022). This phase was done by me and discussed with AEW and JM.

Phase 6 writing up

Quotes from the data and extracts were written around the themes mainly in illustrative style and sometimes in analytic style to answer the research questions. A more descriptive mode of analysis was used for the main interpretation. Transferability was discussed in this phase. The bigger picture of the overall study findings was developed in this phase too.

The 15-point quality checklist for thematic analysis developed by Braun and Clarke (2022) was applied to ensure a rigorous and systematic analytic process. The detail of the checklist can be found in Appendix 19. Reflexive journaling was developed at the beginning of the qualitative study, to document my thoughts and my discussions with others about the study throughout the whole process of research.

7.2.4.2 Reflexivity

Reflexivity is a significant component of qualitative research. The individual differences of the qualitative researcher are considered to influence the research process, from the theoretical foundation to result interpretation. In order to

enhance reflexivity for this research, I used a research diary to write reflective notes after each interview. For the current section, I reflected on the influence of my own characteristics (including gender, professional, and social background) on recruitment and data collection, and on data analysis.

(1) Impact on recruitment and data collection

As a student and a researcher, I considered the impact of my status on participant recruitment. Since the potential participants were all students, as an insider researcher, I mentioned my student status in the invitation letter, hoping to create an atmosphere of equal communication to bring me closer to the participants and encourage more people to participate in this study. Similarly, I introduced myself as a student in the interview in order to have a more open discussion. It is possible that mentioning my status as a student encouraged some students to volunteer to participate and some students to speak more openly.

As an international student, this identity had both advantages and disadvantages for the interviews. According to the research design, half of the participants were international students, which means I was an insider researcher in this situation. When interacting with international students, I was more able to empathise with them in terms of cultural differences. When I shared some of my own experiences and feelings about studying abroad that I prepared in advance, I thought I often elicited richer and deeper responses from international students. It closed the

psychological distance between me and the participants and facilitated the whole interview. However, cultural differences brought about barriers to my in-depth understanding on some content when interacting with local students. I was an outsider researcher in those situations. For example, when participants talked about the local sports culture that I was unfamiliar with (e.g. local teams and the relationship between teams), I found it difficult to respond accordingly, which may have affected the participants' enthusiasm. In addition, English is my second language, which may have had some impact on the interviews. Interactions with local students were relatively smoother than with international students because both the participants and I came from different cultural backgrounds. When both interviewer and interviewee were not native speakers, language and cultural barriers hindered the communication at times. For example, I found it difficult to understand a joke made by a participant from a middle eastern country, which could only be understood in a particular context.

As a Chinese student, this may have made it easier to recruit participants who are also from China (students could tell my nationality by the signature on the invitation letter). Communication with Chinese students in English was very smooth, even though English was our second language. That is probably due to the fact that we share the same basic language system. Two Chinese students volunteered to be interviewed in Chinese because they thought it would allow them to talk more deeply as well as better express their emotions. In fact, I felt that communicating in their native language did achieve more empathy.

My past work experience providing psychological support in a university setting may have made me come across as emotionally stable in the interviews. Having worked with students for four years, I have some experience in communicating with university students and do not feel I am easily influenced by other's emotions and experiences.

Because of the outbreak of Covid-19, some of the interviews were changed from face-to-face interviews to video calls. The change in the location might have affected data collection. Participants were in their own homes when the online interviews were conducted, which was likely to be a comfortable and safe location for them. This made these interviews more like a daily chat. In addition, I noticed that the Covid-19 pandemic created some anxiety in participants, and they would mention the impact of the pandemic on themselves when talking about negative events.

I think my emotional state in the interviews may have affected participants' expression. For example, in my first interview, I felt a little nervous, which may have had an influence on the participant. But it is unclear whether this was helpful or not. I therefore tried to maintain the same positive and calm emotional state for the remainder of the interviews.

(2) Impact on data analysis

My theoretical background and research practice influenced the whole process of the data analysis. For the familiarisation, I asked myself questions, in order to get deep engagement with the dataset. As mentioned before, for instance, as an insider researcher, I asked questions to compare my experiences and views with participants', and to compare participants' answers with existing knowledge/theory. I am sensitive to the core theories relating to the current thesis (i.e., emotional intelligence, humour, psychological well-being, and their relationships) and I found it straightforward to reach an understanding beyond the surface-level of content during coding. I attempted to avoid developing conceptual codes at the stage of initial familiarisation and coding.

For recursive coding, I could interpret participants' responses using my background knowledge. For example, one student claimed that she did not use humour in daily life. However, she provided an example of teasing her boyfriend using metaphors (i.e., a funny monkey). I viewed this as an example of using humour.

For generating themes, it is inevitable that my work was influenced by my theoretical background. For example, I found it easy to capture information about psychological well-being from individual and social aspects discussed by participants. I classified having a balanced lifestyle as an individual factor of well-being, and the role of a students' relationship with their supervisors as a social aspect. Similarly, individual and social approaches to well-being improvement

were more likely to be identified. I am very aware of these, and so I paid more attention to the views of participants that contradicted existing theories. For example, being alone/loneliness is usually seen as a risk to psychological well-being. However, one participant viewed being alone/loneliness as an opportunity for self-enhancement, and enjoyed that situation. Moreover, failing to blend with local students is usually seen as a negative experience for international students. But one participant did not value relationships with local students, so that was less likely to be a negative influence. These examples enriched the information about contributors to psychological well-being among university students, as well as specifically among international students.

The findings of my previous quantitative study and the wider literature of the AMM appropriately influenced the identification of themes. The current qualitative study is part of a mixed methods design including quantitative and qualitative components. It is reasonable to provide qualitative evidence to be supplementary and complementary to the findings of the quantitative study (Morse, 2010). Thematic analysis is flexible and organic in nature, hence a more inductive approach enables explorations within, and driven by, the data content (Braun and Clarke, 2022). Inductive analysis allows gaining insight in a wide range, and generates a rich, nuanced analysis that answers the research question. In order to avoid emerging themes merely framed by existing theories, I kept the research question in my mind and focused on the dataset itself throughout the analytic process, and using reflexive journaling all the time.

I attempted to detect latent meanings and themes based on my academic background. For example, no participant mentioned humour when they talked about the way they self-managed their psychological well-being. However, the majority of participants provided evidence of using humour when I asked them about the way they used humour to improve themselves. Such a finding may reflect the unconscious and unintentional characteristics of humour, based on my knowledge of humour research. That is, humour can be engaged in consciously and unconsciously in daily life (Martin *et al.*, 2003). Similar to activating defence mechanisms (Freud, 1928; Vaillant, 1977), sometimes people may not be aware of their automatic humorous response to surroundings, which is the way unconscious humour functions. A subtheme involving unconscious humour was thus indirectly identified.

As a researcher from a quantitative methods background, qualitative research was a completely new area of research practice for me. This experience to some extent, hindered the establishment of my qualitative research paradigm, from philosophical stance to practice. In the beginning, identifying initial themes, I tended to develop “topic summaries” as themes, and I emphasised the frequency of evidence. I also wanted to compare perceptions based on the frequency of phenomena mentioned by the participants. This was my initial misunderstanding of the nature of qualitative study. I had to re-analyse the dataset to avoid using a quantitative lens. I also listed “tips” to remind me to avoid these impacts when doing analysis. For example, notes like “no frequency” and “no comparison

between participants” were pinned on the wall behind my laptop, to remind me to avoid a quantitative paradigm.

As an international student in the UK, I have had experiences of failing to blend in with local students. Such failure was frustrating for me. I think the relationship with locals is an important aspect of life abroad. Perspectives matter in how people interpret factors that may impact our psychological well-being. I also have experiences of using humour with people from different cultural and socioeconomic backgrounds. Sometimes I would like to use humour, using a punchline for example, but hesitate, because I was not sure if the listeners would understand it, or if it may be offensive in certain cultural contexts. However, some punchlines are unintentional or unconscious, and will not be perceived as offensive, because the listener may understand that you have a different cultural background from them. These may depend on individuals’ knowledge backgrounds and empathy. My experiences and views on certain interview topics inevitably coloured the interpretation of the dataset. I was aware of these influences and recognised my potential personal bias, and attempted to diminish the impact on my research. I took notes when I was aware of influencing the research. For example, I briefly wrote my views in the notebook, to ensure I did not mix my thoughts with the descriptions of participants.

My supervisors checked the reliability and validity of the coding, helped with understanding the data, provided insights from their own local cultural

background, explained the in-depth meaning of particular words, and discussed the logic of the themes. They also challenged me in order to inspire more in-depth exploration of the data.

As mentioned previously, the 15-point quality checklist for thematic analysis developed by Braun and Clarke (2022) was applied to ensure a rigorous and systematic analytic process. I studied the corresponding checklist before each step of analysis, and discussed my analysis according to the list at the meeting with my supervisors. I viewed each criterion as a question, and answered them based on my analysis and findings. For example, according to the criteria of coding and theme development, themes are required to be internally coherent, consistent, and distinctive. Then my question was “are your themes internally coherent, consistent, and distinctive (around the RQ)?” I endeavoured to identify my main themes according to these criteria. This was also discussed with my supervisors. To answer the RQ “what is the role of humour in psychological well-being among university students”, the first theme, meaning of psychological well-being, answered “what does psychological well-being mean to university students and what contributes to their psychological well-being”; the second theme, functions of humour, answered “what are the functions of humour relating to psychological well-being among university students”; and the third theme, self-managing psychological well-being, answered “compared with other self-managing methods, what are the similarities (managing it with others/alone) and differences (context-sensitive and unconscious) of humour”. These three themes answered

one aspect of the RQ respectively, and provided a relatively comprehensive answer together.

The reflexive journaling was also used to question and remind myself during analysis. For example, the question “what are my experiences about blending with home students” emerged in the phase of familiarisation and I pushed myself to compare my story as an insider researcher to the data, to gain deeper insights. I regularly talked over the data and analysis with my supervisors to enhance refinement. Sometimes I discussed my findings with colleagues in the department of GPPC to gain insights from different perspectives. Some excellent examples of published research also inspired my thinking. For example, I carefully read some relative papers on the thematic analysis website maintained by Braun and Clarke, to enhance my thoughts and interpretation of my data. In addition, important materials were kept either on paper or in electronic documents. For example, lists of codes. Thematic maps emerging in different stages were retained on paper.

7.3 Results

7.3.1 Summary

A total of 16 students aged 19 to 43 years (Mean = 26) were recruited in the full study. Of the 16 participants, half of the participants were women. Nine were international students. Seven were undergraduate students, and 9 were

postgraduate research students. As described in the sampling frame, I aimed to recruit participants within the top or bottom 25% of certain characteristics. However, a few participants who met the criteria were not able to take part in the interview. Some students were very close to the criteria and were, therefore, recruited. For example, B3 scored 4.87 on EI, which was higher than the bottom 25% of 4.16. Therefore, the dataset contains a few middle-range participants, covering a broad range of participants. The characteristics of the 16 participants interviewed are presented in Table 7-2.

Table 7-2 Characteristics of participants.

ID	Gender	Age	Source of students	Education	Trait EI	Adaptive humour		Maladaptive humour		Mental well-being			Mental distress		
					High/Low	Affiliative humour	Self-enhancing humour	Aggressive humour	Self-defeating humour	Psychological well-being	Life satisfaction	Positive affect	Negative affect	Depression	Anxiety
					Global TEI										
A1	F	24	INT	UG	6.03	44	39	23	19	219	6	31	26	3	3
A2	M	25	INT	PGR	5.73	45	30	22	36	209	6	34	15	1	1
A3	F	43	INT	PGR	5.53	38	33	40	39	213	6	21	18	1	1
A4	M	21	INT	PGR	5.30	44	41	23	26	195	6	33	21	1	1
B1	M	31	INT	PGR	4.50	47	43	34	39	175	5	22	31	5	3
B2-1	M	21	INT	UG	4.17	43	36	27	29	168	1	28	18	1	1
B2-2	M	34	INT	PGR	4.67	40	40	26	36	164	4	21	20	2	1
B3	F	25	INT	PGR	4.87	34	31	13	11	189	5	25	19	1	1
B4	F	21	INT	UG	2.50	10	12	8	16	82	3	12	24	2	2
C1	F	28	UK/EU	PGR	5.37	56	47	10	30	226	5	22	26	3	3
C2	F	26	UK/EU	PGR	5.53	41	37	25	20	201	6	29	11	1	1

C3	M	22	UK/EU	PGR	6.00	52	51	22	17	201	5	44	17	1	1
C4	M	20	UK/EU	UG	5.60	47	35	17	24	186	6	34	13	1	1
D2	F	19	UK/EU	UG	4.20	45	30	22	21	172	3	25	17	1	1
D3	F	21	UK/EU	UG	4.07	31	32	29	24	163	4	41	37	3	4
D4	M	38	UK/EU	UG	3.10	36	20	12	30	108	2	17	41	4	3

Note: TEI = trait emotional intelligence; PHQ-9 = Patient Health Questionnaire - 9 items; GAD-7 = Generalized Anxiety Disorder - 7 items; UG = undergraduate;

PGR = postgraduate research; F = female; M = male. Meanings of scores see chapter 2&5; INT = international.

7.3.2 Results of thematic analysis

Three main themes were constructed from the data: (a) meaning of psychological well-being; (b) functions of humour; and (c) self-managing psychological well-being.

Table 7-3 describes the main themes and sub-themes identified from the interviews. They will be presented in the order shown in the table, with illustrative quotations and interpretation. Participant ID is shown at the start of each quotation.

Table 7-3 Main themes and sub-themes identified from the interviews.

Main theme	Sub-theme
<i>Meaning of psychological well-being</i>	Involving both external and internal factors
	Perspectives matter
<i>Functions of humour</i>	Functioning as conscious strategies
	Functioning as unconscious responses
<i>Self-managing psychological well-being</i>	Managing it alone
	Managing it with others
	Managing it with humour

7.3.2.1 Meaning of psychological well-being

The theme *meaning of psychological well-being* explored a core idea expressed in different ways throughout the interviews about what psychological well-being means to university students. Participants were asked about their explanations of psychological well-being and views on contributions to their well-being. University students explained psychological well-being mainly based on two factors. One factor encompassed social experiences and outside influences, such as academic achievement, peer pressure, financial situation, belongingness, and social context. The other was individual experiences, including a balanced mind state, disposition, self-acceptance, independence, and a sense of identity. Contradictory opinions were captured, indicating the predominant impact of personal perspectives on participants' psychological well-being. Consequently, I identified two sub-themes: (1) involving both external and internal aspects, and (2) perspectives matter.

(1) Involving both external and internal aspects

A range of views on the meaning of psychological well-being involving external aspects, can be described as a sense of belonging. A balanced mind state with satisfied social relationships and fewer external stressors was interpreted as evidence of psychological well-being. Particularly, relationships with important others were identified by most participants as an essential contribution to well-being. For example, the relationship with family, and friends:

A2: I think that relationship, I mean, the friend... I mean, the friendship will influence me a lot. And, you know, as for the common people, and they are not friend, I don't care them... but if I know one of my friends... one of my friends, and there was some, you know, bad behaviour or some bad words, I feel very unhappy, for several hours, I think. So I think the friendship may be the second... second factor. I think the relationship also includes family. Yes. Family and friendship...

The relationship with colleagues, and supervisors:

C1: I think at the moment that's probably the biggest issue that's affecting my wellbeing is that particular relationship with a senior colleague.

Acceptance and inclusion with others were meaningful to psychological well-being:

A3: the people not blame you for your weakness, for example. And they can accept your weakness. For me. That's helpful. Yes.

The awareness of being included, accepted, and respected by others was described as denoting presence of well-being. By contrast, being lonely or having a lack of connection to others was deemed as illustrating a deficiency in well-being:

B4: You would go down when being alone without going out and you had no body to contact with. There may not be something bad, but it is still down even though things go smoothly. I don't know where it comes. Then, I would feel bad and let me think about it.

Academic achievement was captured as an important external influencer on psychological well-being for university students:

A2: And I think, for me, academic achievements are the best... is the most important factor.

As well as academic pressure, peer pressure was mentioned by B3 as an influence on well-being for university students.

B3: I recently felt it might be peer pressure. I think a large part of the reason for my negative emotions would be from this...All my friends around me, if they are not PhDs, they probably have other new plans in life. But I am still immersed in my studies, and I can't see any results in a short period of time in research. If I compare myself with other people who are also in research, they may publish papers and attend conferences, and they are very good in all aspects. This will put a lot of pressure on me. Then I will doubt myself and question myself, and I may fall into a low mood, that's all. If I have a bad mood, most of it is from that peer pressure. I think, I think it's the worst thing that could happen, right? It is.

Emerging adulthood is a period where people explore their identity, that is, to be what kind of person and to live what kind of life (Arnett, Žukauskienė and Sugimura, 2014). Some PhD students might postpone their exploration due to the length of their education. Their counterparts who graduated earlier probably have made commitments such as steady work and romantic relationships. These comparisons could become a stressor to some mature students. Academic

achievement, in turn, might to some extent determine the future of such mature students, which consequently becomes another stressor to these students. These might reflect the impact of uncertainty during this development period on some mature students.

Their financial situation was mentioned as a determinant of some students' well-being:

C1: So you're in a kind of a financial limbo, and I felt like I was a burden for a while. Even just for a few months and that really makes you feel like upset and kind of oppressed.

International students reported cultural differences specifically impacted their psychological well-being in some situations. A3 reflects the barriers in communication caused by cultural differences, leading to a negative impact on well-being. International students tended to feel stressed when interacting with people from different cultural backgrounds, due to the awareness of possible misunderstandings caused by cultural differences. These misunderstandings might lead to difficulties in being accepted and respected by others, such that connections with others were limited.

A3: But here, I... I meet several people from other country, with many, various in the background for the first... for the first time for me, it's still hard. For example, in my country we can ask people everywhere, and every time. But here, we have to... if you want to ask someone, we

have to make sure that they will willing to ensure our... our question, and also there is a culture in this country, I found that we have to... to do every... everything in our life by ourselves, so...sort it out by yourself, then... then ask for help for others. So for the first time, to me, it's very, very stressful.

Some students opted to intentionally avoid interacting with people from different cultural backgrounds, in order to reduce the possibility of potential conflicts. They also tended to ascribe this “distance” to their own fault:

A2: So every time I talk with foreigners I'm very discreet, and I... I want to keep the distance. Okay. So I think it's... it may be my own problem. And I... I can't put 100% comfortable feeling to foreigners, the non-Chinese, but... but when I talk with Chinese, I can talk freely.....I feel uncomfortable when I think of cultural differences.

Other international students reflected that this “distance” might be a result of a language barrier:

A4: maybe because my language ability is limited, I cannot say that, but yes, I... I do attend a lot of social activities, by... by doing these sports.

Although international students were aware of these cultural and language barriers, some of them tried to blend in with home students by taking part in communities and activities (e.g., holiday events, team sports, and excursions). However, they found it difficult to eliminate their sense of exclusion from local society:

A4: Hmm... the hardest thing for being the student here is like... I asked you to ask me before, there's a cultural difference between the locals and the Chinese. So I want to say, although you're still trying to being part of those locals, but there is still a gap you cannot overcome. You always face some resistance all the time. I mean, even you try very hard, you may fail to be part of it.

Students coming from a relatively monocultural country, such as China, were more prone to be negatively impacted by cultural differences. In contrast, their counterparts from a multicultural country, such as Indonesia, were less likely to be influenced by culture:

A3: From my point of view, I came from Indonesia. Indonesia is... I mean, we have more than six hundred kinds of ethnics, too, so in my... in my everyday life, I meet several people with different background.

Stories from international students highlighted the need for mutual understanding between students with diverse cultural backgrounds, especially students from a monocultural background. This also reflected the significance of the sense of belonging to psychological well-being in university students. Little information regarding experience of cultural differences was captured from home students, which probably reflected the deficiency of connections between international and local students in the University.

The last four interviews were conducted via online video during the beginning of the Covid-19 pandemic. There were no obvious differences caused by different

interview methods found in responses, compared with in-person interviews before the pandemic. However, a public health emergency, such as the Covid-19 pandemic, was captured as a significant negative influence on students' well-being. It was clear that negative emotions, such as anxiety, were intensely aroused by the pandemic. For example,

A2: I have. You know, in recent days, and I think every day is bad. Because of the virus, and...I feel very upset, and eh... before the virus outbreak, you know, I... I like cleaners, and hygiene is very important for me. You know, in recent days I feel, 'oh, the world is unsafe and the big environment is bad'. So I can't focus on my own jobs, and I... I spent several days to think the best... sorry, the worst result of this virus. I mean, in the current situation. So I think the big environment, will affect... will affect me.

Isolated from the social environment as a consequence of the pandemic impacted well-being in an adverse way, which is also an example highlighting the importance of social connections:

A4: the Coronavirus, which locks you up in your house. And this chaos makes you feel really bad. We're kind of being put into a prison. Mm-hmm. So that's made me feel depressive as well.

The emerging adulthood period is deemed the most unstable time in the overall development period (Arnett, Žukauskienė and Sugimura, 2014). People have the relatively fewest social relationships during this time, leading to low social support and potential risk of depression (Arnett, Žukauskienė and Sugimura, 2014).

These features suggested that university students might be in need of developing some social connections to gain adequate social support to maintain their well-being. Such need can be identified in both international and home students in the current study.

There were perceptions relating to internal factors which constructed psychological well-being as a contented mind state. A balance between a more positive and a less negative mind state was indicated as the presence of psychological well-being:

C1: Yeah, I guess to me a sense of wellbeing or mental wellbeing would be being content with my own thoughts. Mm hmm. So... I guess not feeling anxiety or stress. Yes. So just being okay. Yes. So not it doesn't have to be like an incredible happiness, I just think that wellbeing for me is... is being okay with my thoughts and being positive. And... yeah, just being content, I guess. Having a level of contentness and I guess some confidence just feeling, yeah, contentness, I guess is my best word.

The most frequently cited internal factors explaining psychological well-being were lifestyle and personality. The following quote illustrates the emphasis on personal life and subjective experience, which includes the importance of a regular routine and work-life balance.

C2: But at the same time, ensuring that no matter how much I have to do I make sure to maintain that work-life balance. So working kind of work hours which for me is usually between eight and four. And then

even if I've got loads to do making sure that I have time to sit and have a proper meal, spend time with my husband and, you know, chill out. Go to the gym. 'Cause I find that when I make sure to keep that time for myself I actually end up being more productive at work and doing more than if I just do like a thirteen or fourteen hour day.

Participants talked about how disposition could affect their well-being. A pessimistic disposition may lead to low mood and negative emotions.

B4: I am the one [the kind of person who] apt to be affected by others.....Even though there were something good, I would also think about so many [negative] things. Sometime maybe there are some good things, but I would think that it won't last for a long time and something bad may would come to me soon. Then, I would turn to negative ideas.

In the following quote, psychological well-being was linked to personality. The ability of being aware of inherent characteristics, especially deficiencies, was deemed as an indicator of well-being. B3 probably reflected the pursuit of resilience and self-acceptance.

B3: There are some setbacks you may have encountered, right? But actually this kind of setbacks can be overcome. Yes, some small difficulties can be overcome. I think there's also dissatisfaction with yourself, right? You must know where you have flaws. No, not flaws, it's a deficiency. But in fact, in terms of personality, or in all aspects, it's a deficiency. Although you are aware of it, you will not change it immediately. But because you are aware of it, you, I think, will have a kind of psychological implication, right? It is often that I may be more sensitive to this kind of things, and I think this is really a problem for

me, my wellbeing.

Some participants described a more comprehensive understanding of psychological well-being, which viewed it as a multidimensional construct consisting of dispositional, emotional, and self-/other- acceptable characteristics:

B3: I think mental health may include quite a lot of aspects, such as personality, normal personality, emotions, and there is no obstacle to expressing emotions, and then the whole person will not deny himself/herself often. At least his attitude towards life is positive, so. Then, yes, something like that, I think.

The effective management of planning and low-procrastination were mentioned as indicators of psychological well-being, which reflects an aspect of flourishing in emerging adulthood (Keyes, 2013 cited in Tanner, 2014):

C1: Well, for me, I think getting, like getting a... getting some of my to-do list done. Like I have a lot of experiments to do, so I guess checking things off my to-do list.

D3: Mm hmm. I've—I feel like I've been, like struggling with this for years, so it's usually frustration that I'm like I'm continuing this again. Like I know I will, if I leave things for the last minute, I will be very stressed and don't feel good, but I still continue to do it, so it's like frustration with myself that I can't start things earlier.

A sense of purpose was obtained as a motivation of being psychologically well. The following participant D4 had just finished studying at the university when they

took part in the interview. D4 was during the transition from a student to an adult having a job. D4 thought having a stable and regular life can afford him a sense of purpose, which was helpful with maintaining psychological well-being.

D4: There's a lot, it's a lot better. I think it helps having a, like a purpose. Not that I didn't as a student, but it's— you need to be a lot more self-motivated, I think. When you have a job you kind of have to get up in the morning. Have to turn—and I find that very useful, very helpful for me.

(2) Perspectives matter

Contradictory views were captured from the data. Personal perspectives on “adversities” constituted an aspect of psychological well-being. For example, being lonely/loneliness was viewed as adversity by some students, however, other opinions viewed it as an opportunity for self-development:

B1: It's okay. Sometimes, as a person sometimes I'm feeling, or I feel I can find myself more by being alone. For example, yeah, you will have a time to do, let's say, anything, you have time to read, you have time to develop a new idea. Maybe during... somebody when you say that if you are living alone for somebody maybe you will, don't like that because, you know, the badness of loneliness, being lonely, that's right. So for me, no, I don't feel that being lonely is that bad. It's like maybe a chance to be a creative person. I keep thinking and doing something to that develop yourself.

The difficulties of blending in with home students were viewed as adversity by

some international students, however, this kind of social connection was not definitely necessary for other international students who can self-regulate their emotions. They regarded having clear goals and the current goal-achievement as the most important indicator of well-being. For example:

B3: Personally, I don't have much of a social life. The only social life is for myself. And I also spend some time with Chinese students, who have a better relationship with me. After all, there is no cultural barrier with Chinese students, and then it is easier to communicate with them. And for foreigners, they are polite and courteous, just to achieve superficial harmony, that's all...In this case I think I also do not want to have more in-depth contact with them (home students). And I am not interested in their lives, when my colleagues are chatting, I feel bored, and I cannot find what they are laughing about...But I can regulate myself (emotions), because after all, what I am doing is PhD. I am not here to make friends with anyone, I must make sure to study well.

Similarly, cultural differences were described as an opportunity for enriching knowledge:

A2: And because of these differences I think I learnt a lot from the different cultures, and we should... we should have the openness... open attitudes to the... to these cultural differences.

Being part of the international community was also described as a challenge and reflected the need for a sense of belonging:

A2: But... you know, something about, you know, religious and sometimes

Glasgow... Glasgow English, sometimes and, you know, Indian culture and their food, and there a lot of differences around me, and as an international student, and I... I always have open attitudes to...to be used to these differences, and I think we should try our best to get involved in these difference activities, and I mean, the social activities. Yes. Being a member of the international community.

When facing a threat, such as the COVID-19 pandemic, understanding the nature based on relevant information about the virus and the situation was reported as an effective coping strategy for this emergency. This reflects the importance of information and reasonable analysis when encountering an emergency. For example:

***B1:** Coronavirus situation, many people panic now about the Corona and this stuff. So instead of getting panic, go and search about the virus, pick out good resources and you'll know the virus and then later on you'll find all the panic's just like an illusion.*

The above contradictory views reflect that sometimes psychological well-being can be influenced by personal perspectives and values. Although social connections were significant to well-being from some participants, subjective values were more important for psychological well-being. Cultural differences were perceived as a challenge rather than a difficulty for some international students. Contradictory opinions perhaps reflect that internal factors tend to be more crucial than external for psychological well-being in some situations. Psychological well-being can be illustrated as an outcome of the interaction

between internal and external factors. This view was captured in the data:

A1: It's kind of... psychological and mental wellbeing... basically like how you're coping with your surroundings and how that influences you.

It was noticed that a few students seemed to find it difficult to explain psychological well-being. Even though they talked a lot, explanatory information was limited. D4 scored low on trait EI and was also at high risk of mental distress, in the survey.

Question: what do you think we mean when we talk about psychological/mental well-being?

D4: I suppose it's a broad... (Overtalk) Yeah talk about things like, not just about mood, but just like mental health issues as well. Like not just necessarily like specific diagnos—diagnosis or like psychosis, anything like, but just, I think, I don't know if it's more of a prob—an issue these days than it used to be or maybe there's just more of an awareness now, but there's—I've definitely, I've had experiences with poor mental health myself, do you know, with depression and anxiety and things. So, I mean, I think it's very, very broad. Talking about psychological and mental health is massive, like I think everybody is on some sort of, I don't even know if it's as linear as a spectrum, but there's, I think there's a lot going on psychologically and mentally for everybody.

7.3.2.2 Functions of humour

Understanding how humour functions every day is important to explore in the role

humour has in self-managing psychological well-being. The second main theme was around the functions of humour. Humour can be engaged in consciously and unconsciously in daily life (Martin *et al.*, 2003). One aspect of this theme described humour as a conscious strategy that can be chosen in certain situations. Such strategies involved both inter-/intra- and adaptive/maladaptive aspects. Similar to activating defence mechanisms (Freud, 1928; Vaillant, 1977), sometimes people may not be aware of their automatic humorous response to surroundings. Two sub-themes were thus generated under the second main theme: (1) humour functioning as conscious strategies; and (2) humour functioning as unconscious responses.

(1) Humour functioning as conscious strategies

Participants expressed a range of views on humour behaviours. They conceptualised humour as a wide-ranging construct that consists of situational and personal characteristics. The way participants viewed humour was coloured by the user's personality:

A1: I think it honestly depends on the person as well. Especially if it's a person who might feel more socially awkward, and they use humour to, I guess, diffuse those situations and stuff...they've all kind of...depending on like their personality itself...would kind of determine how they used humour.

C4: It depends how mature the person is. Some people prefer more like

outrageous humour than others. Some people are quite conservative in their humour.

Humour was also dependent on who you talked with. Participants reported their experiences of using different humour with different people:

C2: There's... when you socialise with different people I guess you speak in different ways. So it would only make sense that your humour would change depending who you're speaking to.

Generation gap tended to hinder the mutual understanding of humour:

A4: When I speak to my grandmother... Yes? ...you need to use the humours which they can understand. Mm-hmm. Yes. But when you talk with your friends, the peers I mean... Yeah. You can say anything. (Laughter) Yeah. There's no barriers between you and your friends, so that's kind of interesting.

The effectiveness of using humour depended on your familiarity with the people you talked with:

B3: I think the sense of humour should be used carefully. That is, you have to talk to this group of people. You know about each person's personality and then you can decide to use what sense of humour, some people he does not think you are not laughing at him. Otherwise, it is very embarrassing. For some people, if they are your real friends, they will understand your words, I think. So it depends.

Additionally, anonymity might facilitate using humour:

B2: (when use humour in an app for like communication and stuff) So basically, because I have like a, anonymous, so basically, I can make like, jokes maybe jokes and stuff and, that, I, which I won't do to my parents.

Humour was also considered to be situation specific. Participants expressed that humour should be appropriate to the context:

C2: I guess it's probably a bit more informal and maybe a bit more rude or swears or whatever with friends. But if it was in a professional environment it would be a bit more, well it would be a lot cleaner and maybe wittier, I'd like to say, wittier but I don't know if other people think that.

This account reflects that certain kinds of humour might have different meanings and produce divergent effects in different situations. Additionally, different social relationships regarding power between producer and receiver of humour may influence the use of humour. Culture was considered as a significant contextual factor that influenced humour. The content of humour would vary depending on the different cultural backgrounds of the people involved:

B2: I know sometimes in UK people like to laugh something like about not humanity, like a bit like something like sexy, sex, sex, about sex (overtalk). But they (stutter) they don't care about it. They think it is freedom. But maybe some Chinese people think 'oh, it's bit like offensive'. Yeah, I think this is something I have been... but I have... I was

a bit offended when I first come to UK in a couple of years, but now I used to that.

Although in the same cultural context, understanding humour still required certain background knowledge:

D2: Even though I've grown up in Glasgow, I don't always understand the jokes that my like mates who have white friends would make. Because I think it's more like historical, like they'll say a joke that's a reference to something in the culture over here, that I wasn't aware of when I was raised, or like brought up here still, so yeah, there is that like kind of clash of humour sometimes.

Language barriers that accompany cultural differences hindered understanding humour in daily life:

C2: She's actually from Kuwait so sometimes... and English is her second language as well - so sometimes I'll say, you know, like a joke, I can't think of one off the top of my head, but she won't always know what I mean by that. And then I'll have to explain it. I guess the Scottish humour can be quite harsh, I guess, sometimes. Like when you were saying about making like a self-deprecating joke and things. So I guess if I would make a self-deprecating joke which normally someone would find funny, she just thinks I'm insulting myself and then tries to like say, "Oh no," blah, blah, blah, like tries to cheer me up or whatever but it's just that she's misinterpreted the joke. So I'd need to explain that it was a joke and it was just because of the moment kind of thing.

Humour involved both inter- and intra- personal processes in daily life. The

interpersonal humour expressed in communication with others was the most common way, such as telling jokes and funny things with others:

D2: I think I use humour to connect with people, again, as I said, yeah, to like share a joke with friends and... or like to get someone out of a bad mood or something.

C1: I have a lot of friends, like chat with friends where I will send funny pictures or memes to each other, and we do that all time. So we try and make each other laugh all—if we see a funny picture, we'll send it to each other.

Situational humour, such as puns, witticisms, and sarcasm, in social communication:

C3: I just make very bad puns essentially (laughs) and, yeah, crack stupid jokes. It's always very situational I feel, phew, I'm not like actual set-up joke, it's always kind of situational humour.

C3: I mean witty one liners is quite fun. Like, you know, if something happens and just like an amusing kind of wit to kind of come up with it is always my favourite type of thing. I mean also I think I... I watch funny anecdotes which is my type of joke rather than actual kind of punchline setup kind of jokes.

C4: Just probably sarcasm in everyday life, yeah.

Sometimes participants tended to use self-deprecating humour, a theoretically

maladaptive way, to facilitate communications and comfort themselves:

A1: Maybe self-deprecating humour is the best way to go about it, with... especially in school. Oh man. But being like, 'ah... I am so bad at this...' Or just like using humour in almost a self-deprecating way. Even though I don't actually feel, I'm like, 'no, I'm actually really good at this.'

The following quote reflected a discreet method to effectively engage with self-defeating humour in communication. The stories of A1 and B3 suggested that self-defeating humour sometimes enhanced social connections, which might imply that self-defeating humour is not always maladaptive, it depends on the context and method involved.

B3: I think in order not to make yourself embarrassed, you have to, first of all, lower your posture a little, and then maybe make fun of yourself.

For intrapersonal humour towards themselves, participants tended to regulate their emotions by humour:

C1: I think that is really important having humour and seeing the funny side of stuff. So, I mean I make mistakes in the lab and you could end up blaming yourself and getting angry, but the best thing to do is to just laugh about it and just say, "I messed up. Let's start again," and...have some, you know, don't take it seriously, just try and, you know, joke about it, and lighten it and it really lifts the mood in the lab. So, it's really important, I think having a sense of humour, and taking a break to watch something funny that makes you laugh because it, it really makes a big difference to me.

In the example above, sense of humour provided participants with humorous and optimistic perspectives that facilitate coping with stress. In addition, watching comedy was mentioned as a way to de-stress in daily life. Such self-directed humour engagement also functioned in well-being improvement (see later section).

(2) Humour functioning as unconscious responses

Investigating unconscious behaviours is usually problematic, however, this phenomenon might be detected and consequently inferred from particular examples. The story of C2 provided helpful evidence:

C2: well I learned recently... I had to do a presentation to my department, and it was just like a presentation to introduce yourself. I'm in a really big department so we have what we call a 'unit conference' and every, that happens two or three times a year and every time it happens there's about three students and three staff members have to do a presentation just on themselves. And I'm quite short so there was a few short jokes in mine. And a few people came up to me and said that the presentation was quite funny which was completely unintentional. So I guess my way of dealing with the nerves of presenting to the department was to bring humour into the presentation.

Humour appeared “completely unintentional” as a defence mechanism or an unaware response to nerves and stressful situation. The participant C2 was aware of having used humour in her presentation only because others praised her humorous presentation.

Sometimes humour is used unintentionally:

D3: Sometimes it's just like, "Oh I thought about this thing suddenly..." and just through, I don't know, a sentence, a word, and it's funny, so it's difficult to give example because it's like so— it's just a moment and then it kind of goes away.

B4: I should not be humorous. I won't make a joke actively; or I just make it suddenly but I won't make it on purpose.

Although B4 denied intentionally using humour in daily life, she had a medium score on the HSQ in the Phase 2 online study. B4 might also be aware that there could be unconscious humour used in daily life because she had mentioned "won't make it on purpose".

7.3.2.3 Self-managing psychological well-being

The theme *self-managing psychological well-being* explores a central idea about how university students manage their psychological well-being in daily life. Interrogation consisted of two groups of questions, one asked interviewees to give examples about managing emotions when responding to negative emotions; the other asked them to give reactions to, and explain how they coped with, emotional stress such as negative emotions being directed at them from others. For the first topic, examples involving both individual and social strategies were captured in most descriptions, avoidance behaviours were common in the

individual approach. For the second situation, problem-solving strategies were divided into two tendencies, avoidance - dealing with problems alone (intrapersonal process), or active engagement - communicating with others (interpersonal process). However, no students mentioned humour as an approach to managing psychological well-being under the core question in this section. In order to obtain adequate evidence of humour behaviours, questions about how they thought humour functioned with self-managing psychological well-being were asked. Evidence was captured involving both inter- and intra- personal processes. Therefore, three sub-themes were identified: (1) managing it alone; (2) managing it with others; and (3) managing it with humour.

(1) Managing it alone

Indoor and outdoor leisure activities, such as running, cooking, and watching comedy were reported as common ways participants tended to deal with stress, or comfort their mental state, alone. When faced with negative emotions, avoidance behaviours were mentioned:

A1: I might get... with their negative emotions coming at me, I might get angry. I won't do anything against that anger, I'll just be like, 'ah-ha...' And I'll be like, 'breathe, and calm down,' and then walk away from the situation...I'm going to steal words from Elsa, 'conceal, don't feel...' (Laughs) But just hide it from that situation, until I can get out of it and process it.

Keeping away from stressors was more likely to have a short-term effect on reducing negative emotions. In contrast, some participants opt to encourage themselves to manage these emotions:

A3: I can say myself is less stress. I can say. Why I say that, because every time I have a problem, I talk to myself, I can sort it out. Just be patient. Don't got.. don't get stressed about that.

Some participants, such as A4, used constructive thinking to understand the current situation, and regulate their emotions, reflecting their ability in efficient problem solving. Solutions to negative emotions ranged from more active and constructive approaches at one extreme of high EI, to more inactive and avoidance at the other of low EI. A clearer purpose to solve these difficulties rather than merely escaping from negative emotions tended to be mostly captured from high EI participants.

A4: Like the... the relationship is like playing cards, like when you... when you draw the bad card, the important thing is like how do you play for... for the future, not con- not concentrate on you just having a bad card temporarily? But you still need to play instead of just give up at that time. And so yeah. People have... someone need to get up from the difficult situation. Mm-hmm. Yes. Some day. Yes. Or you cannot achieve anything.

In addition, some participants mentioned specific ways to regulate emotions, such as meditation. Crying and staying alone were also mentioned by a few participants.

B3: And then I will cry. I'm easy to cry. I may be in the dormitory and find a touching movie, and then find a channel to release my negative emotions. After crying, I feel better..... If I have a bad mood, I do not want to be around people. I want to stay alone, and then think about them. I do not like people to talk to me at this time.

When facing emotional stress from others in a social context, withdrawing is the first step of coping for some participants. They also tended to reflect and make themselves calm down, and used avoidance of the circumstances or person:

A1: With their negative emotions coming at me, I might get angry. I won't do anything against that anger, I'll just be like, 'ah-ha...' And I'll be like, 'breathe, and calm down,' and then walk away from the situation...

Blaming self was described as one response to stress from others:

C1: I'm internalising the blame. I'm blaming myself. Like when she says I—(stutter) you know, she needs it faster, I then blame myself for not being fast enough. Even though, I do, you know, I need... I need to recognise that, you know, it was a Sunday, it's... I need rest. So... Yeah, I guess I, I'm trying not to internalise those feelings from her, yeah.

Crying was used as a way to release negative emotions:

A1: I would be... 'Ah I've disappointed you', I might start welling up with tears, and like 'no, hold it in... hold it in...' And then as soon as I can leave the situation, leave the situation and be like... and cry a little bit, and then be like it's fine.

Participants who preferred avoidance behaviours tended to escape from such situations and silently accept the stressful emotions directed at them, which may be linked to more negative outcomes. In addition, avoidance oriented behaviours have been found to be associated with low level of EI in previous quantitative studies (e.g., Kovačević et al., 2018; Prentice, Zeidan and Wang, 2020).

(2) Managing it with others

Seeking social support was suggested as the most common way of dealing with negative emotions. Participants preferred to speak to important others such as friends, parents, and supervisors, as a means to release emotions:

C4: But most importantly speaking to other people as well, speaking, speaking to my friends and my parents as well, they were very helpful. And, you know, because it's not very good to just, you know, have all these things inside you and not be able to talk to anyone.

The account of B3 highlighted that communicating with others could provide a richer perspective of looking at the problem, such information support reduced their negative emotions and enriched methods of solving problems.

B3: One is to communicate more with others, I think. Because the perspective of people looking at the problem may be different. Maybe you will change a way of thinking after you listen to him/her, and then you will feel that the matter is not so serious. One is communication. Anyway, you cannot be too closed up, that is, communicate with others.

Participants spoke of the importance of social networks. For example, the purpose of social activities, such as hanging out with friends, was not about solving problems, which provided participants with the possibility of avoiding becoming immersed in negative emotions, and gaining social support.

A4: I think like hanging out with friends, just maybe singing songs, playing... like playing cards, drinking alcohol can also help you get out of that bad mood, because once you start to forget those bad feelings, you kind of save yourself from those bad emotions. And gradually you can find yourself escape away from those bad emotions, and then you can calm down and start doing those things again.

Close social connections provided students with effective support. The participant C1 described mutual understanding as a key element of their relationships with others. Talking to friends who had similar experiences would be of benefit to improve negative emotions. These reflected the importance of emotional support and information support to well-being, which can offer sympathy and advice to individuals. In addition, having professional support, such as counselling input, was described as an effective way to improve mental health.

C1: I guess...I'm... I think it's the same and then when I spoke to my friend who had finished a PhD and changed career. She had done a science PhD and she changed to become a life coach and do some counselling sessions she was interested in people, and she knew how I felt, so speaking to someone who knew what that position felt like was very useful because you feel like someone understands. So I think having her with that experience, I think going to a regular counsellor may not have been as

good because they wouldn't have understood what I was going through. But this, my friend really understood that feeling of uncertainty and the... the kind of frustration that comes with wanting to finish and getting more corrections and you just want it...

This account suggests that empathy might play a significant role in effectiveness of social support. Social approaches to obtaining an emotional buffer against negative life events were commonly reported among high EI students. It is worth noting that the participant C1, a postgraduate research student, who scored high on trait EI, adaptive humour styles, and eudaimonic well-being in the quantitative study, reported high mental distress at interview. This suggests that a particular temporary stressor, such as difficulties in doing a PhD, might overwhelm students' habitual behaviours in coping with stress, but was less likely to impact on their purpose in life. Additionally, distress, such as anxiety, caused by uncertainty is a common risk during emerging adulthood (Arnett, Žukauskienė and Sugimura, 2014).

When encountering emotional stress from others in a social context, some participants preferred active engagement via interactions. They tended to communicate with, and apologise to, the person expressing negative emotions to them:

B4: *I would wonder whether I am really wrong. I would keep apologizing if I really do something wrong, and I would feel guilty. I would also make apology if I know I am not the wrong one because I should be the one who annoys him. It is more important to take care of his emotion. As friends, I think feeling is much more important.*

B4 viewed apology as the primary solution to this problem, because friendship is more important than being right or wrong. B4 was able and willing to admit being wrong, which is an indicator of flourishing during emerging adulthood (Arnett, Žukauskienė and Sugimura, 2014).

In contrast, other participants adopted methodical solutions via communication:

A3: Commonly I will silent, silent, and think about that word and they're angry, or their behaviour, and after that, I come to the people and say, "I'm sorry, I don't mean, blah, blah, blah, blah. I'm sorry, I know what you... what do you expect from me, but at the time, I think blah, blah, blah, blah..." I think I have to talk to the people who make me feel not comfort. Not to argue, not to... to fight. But I think I have to express what I think. Something like that.

In the example above, the participant took a three-step strategy. First, they regulated their emotions and reflected on the possible reason for the problem. Then, they used an apology to lead to the next communication. Finally, they expressed their thinking and found a solution based on communication. These reflected social competence and problem-solving abilities.

C2: I think in person I would try to discuss it with them in private. And try to clarify what they thought happened and then what I thought happened and where the discrepancy was. Probably in private I would probably ruminate on it a little bit (laughs) and I guess I'm a bit corny in the sense that I think that everything's a learning experience so I'd probably try and reflect on it and, how I could improve my

communication skills with people for the future.

The participant C2 took a sophisticated solution that meant they would like to improve their communication skills by solving this problem. They reflected on the issue from a different perspective and finally tried to learn from having had the experience of this problem. In the current data, methodical solutions tended to be captured from high EI participants, and active communication strategies tended to be gained from low distress students.

Both intra- and inter- personal approaches were suggested by some participants:

B3: One is to communicate more with others, I think. In fact, sometimes it is necessary to digest alone, but not always alone. You need to find a person you trust, and then communicate with him/her.....The others are kind of small things, say eat a thing you like, and sometimes watch a video. This is the kind of a moment, which make you suddenly be positive again.

In contrast, some of those students adopted only one of the two approaches when talking about an example of coping with negative emotions:

B3: If I have a bad mood, I do not want to be around people. I want to stay alone, and then think about them. I do not like people to talk to me at this time.

The particular approach adopted might be influenced by particular contexts.

As previously mentioned humour was not initially offered as a distinct strategy in the interviews when talking about how university students managed their psychological well-being in daily life. This may reflect that humour could more probably function as an unconscious response in this self-managing process, than as conscious strategies that could be chosen. This finding resonated with the concept developed by Martin *et al.* (2003) that humour can be described as a combination of both conscious and unconscious behaviours. Moreover, this finding suggests that conscious humour may not be a very commonly used way of self-managing psychological well-being. The following sub-theme particularly explores the role of humour in this process.

(3) Managing it with humour

Participants were directly asked about how they use humour in managing psychological well-being. On one hand, participants provided examples in relation to both intra- and inter-personal processes to managing well-being. Participants talked about many examples of using humour to regulate their emotions in negative situations via intrapersonal process:

B1: Maybe I reflect my, the bad things that's happened in my life as humour or making it like a jokes on myself and even I joke with my friend don't like that. Also sometimes it's event, if something terrible happen, for example, for me and for my friend, starting to make humour on that topic just to, let's say, absorb the anger or absorb the bad feeling that the other people have it.

As discussed before, unconscious humour sometimes can function as a response to the stressful situation:

C2: well I learned recently... I had to do a presentation to my department and it was just like a presentation to introduce yourself...And I'm quite short so there was a few short jokes in mine. And a few people came up to me and said that the presentation was quite funny which was completely unintentional. So I guess my way of dealing with the nerves of presenting to the department was to bring humour into the presentation.

Humour also provided a positive perspective to people:

Question: do you ever use humour to help you feel good about yourself or situations?

B2: I don't remember any particular like example I can give you right now. But I tend to like look at the good things, good side of things I suppose. So, if something bad happen, I just want, I just maybe look at the good aspect of it I guess.

On the other hand, participants described humour as a social lubricant that could improve the atmosphere in social interactions, which reflected a better social competence and was linked to interviewees who tended to have higher levels of EI in the survey.

A4: Like when you, when I talk with my supervisor, when... both of us become very... I'm very serious, to one point I will try to use humour to

get off both of us into a very interesting conversation.

Transferred positive emotions caused by humour could improve relationships:

C1: So I guess to improve relationships like making friends over, like playing a board game that is funny because when you laugh together, I feel like everyone bonds more.....I work with mice and rats so I have to teach the students how to handle mice and how to inject them and how to do some experiments using mice. So that's very, that can be difficult if someone has never handled a mouse before. But making a joke in that situation, being humorous. It makes the animals feel better. It makes the person working with them feel better. And it helps the relationship with me and the student. So it is, I think that's really important, and... Yeah, I think working with animals really highlights that you need to be stress-free and that you need to be humorous because if you make someone feel anxious, the animal's going to feel anxious as well.

This account reflects a “ripple effect” of positive emotions, that is, positive emotions can transfer across people's social networks without directly interacting with the initial one (Fowler and Christakis, 2008), thereby promoting social connections. The participant mentions the positive emotion created by humour may even transfer across species.

The following account is another example that describes how participants used humour to support each other and thus bond social connectedness and rich social networks:

A1: I don't know. I can definitely see... like thinking of my school, like everybody at my school as a whole, and also just seeing how we all cope with it, we all use... like because it's an extremely stressful degree, extremely... it's very... it's very insane.....we're very concerned and everything, so we're all, can be prone to like imposter syndrome, or like an empathy burnout and stuff like that. And vets have definitely some of the highest suicide rates out of any profession, so we're all very aware and concerned about that. And I think we definitely use humour to just help us float along and get through it, we're always trying to make each other laugh.....or trying to make ourselves laugh. So that way we can get through it in one piece. (Laughs) I guess. And just improve morale and quality of life as we go along.

The participant D4 found it difficult to tell a story of using humour in daily life and they had been found to have low EI and high distress in the survey. He was also less likely to be able to express his understanding of well-being. These could potentially be indicators of potential mental health problems in practice.

D4: But I think it's more in (stutter) with that, do you know, if they're less serious things. I don't let those get me down. You know, quite—I'd probably find those a bit funny. Just like unfortunate, like, "This is ridiculous that this bad thing's happened. I kind of find it funny." I think in the other, in terms of like relationships with other people and things, I think I don't really use humour for that. I think I take those things too seriously.

Although international students had more difficulties using humour due to cultural differences, they reported rich information relating humour to promoting well-being and facilitating negative situations. This reflects that humour is a context

sensitive behaviour.

7.4 Discussion

7.4.1 Summary

The qualitative study comprised semi-structured interviews with 16 students who had participated in the previous quantitative study. The findings gave an insight into psychological well-being and humour from the perspectives of university students with a range of characteristics. Participants discussed their understanding of psychological well-being, protective activities and behaviours for well-being, as well as the way they used humour in daily life. Three main themes were constructed: *meaning of psychological well-being, functions of humour, and self-managing psychological well-being*. Overall, psychological well-being was described as a balanced state of mind involving contentment and satisfying social relationships. Participants' outlook was found to be a significant contributor to their psychological well-being, reflecting how flexible outlooks (a feature of high EI individuals) relate to mental states. Humour was mainly described as a contributor to psychological well-being and functioned both consciously and unconsciously. Evidence regarding well-being reflecting features of emerging adulthood was gained. Cultural differences were described, especially for international students, as a prominent factor impacting on well-being, and a barrier in using humour in daily life. The findings resonate with much

of the literature but there are also some novel findings reflecting the contexts of emerging adulthood and home and international student status.

7.4.2 Meaning of psychological well-being

A range of views on psychological well-being were identified in the present study. The nuanced descriptions of psychological well-being involving internal and external factors, covered both eudaimonic and hedonic approaches (details about eudaimonic and hedonic well-being can be found in Chapter 2). These descriptions were usually explained based on their life experiences, highlighting the current understanding and situation of students' well-being during emerging adulthood. For example, personal development was considered to have significant implications for psychological well-being. Participants were concerned about their growth during their life span, especially during university. Tolerating and dealing with uncertainty was viewed as a challenge to their well-being. Awareness and acknowledgement of bad personal qualities was also mentioned as an aspect of their well-being, which indicated the importance of self-acceptance. All of these views can be linked to dimensions of eudaimonic well-being and they represent some features relating to the theory of emerging adults. Participants also described psychological well-being as a positive mental state without distress such as anxiety, indicating a viewpoint of the hedonic approach. In addition, the findings add evidence to the distinction between eudaimonic and hedonic well-being. For example, a final year student suffered from feeling anxious due to

uncertainty but kept positive in purpose of life.

Another interesting finding in this study is that cultural differences not only impacted well-being in international students, but also influenced home students. Communication between international and home students was described as poor due to the barriers caused by cultural differences, which was detrimental to blending with locals for international students, and limited opportunities of learning from diverse cultures for home students. Participants mentioned that individuals from a multicultural background were less likely to be troubled with, as well as more likely to benefit from culture-related factors. Being able to learn from diverse cultures may contribute to students' well-being. Cultural differences therefore can be viewed as a significant contextual factor affecting psychological well-being in the current trend towards globalised education.

A few participants were interviewed during the beginning of the COVID-19 pandemic. The impact of a public health emergency, such as COVID-19, on psychological well-being in university students was discussed. Facing a health-related emergency, participants experienced rising concerns about the future and fears relating to the virus. Some students discussed their anxiety and the precautions they took for the pandemic. Reasonable analysis based on relevant sources of information about the virus and the situation was suggested as an effective way of coping with this emergency. Information was deemed by one participant as a protection in this situation. These findings may reflect one of the

ways in which university students respond to typical health-related emergencies. Under usual circumstances, the prevalence within one year of any mental disorder among emerging adults has been found to be higher than any other age-group, especially for anxiety and mood disorders (Kessler *et al.*, 2005). It is possible that this vulnerability of emerging adults may mean they suffer more mental distress from pandemics than other age-groups. This may also then mean this group require more assistance than expected to cope with this public health emergency.

The contradictory findings highlighted the influence of personal perspectives on psychological well-being in university students. People with a flexible and positive outlook tends to look on the bright side of their life and view adversity as a challenge. For instance, participants viewed cultural differences as an opportunity to enrich their knowledge. Compared with interacting with locals, they were more concerned with academic achievement, and the cultural barriers may have been less likely to be detrimental to their well-being. These findings highlighted the prominent effect of flexible outlooks on students' well-being. Flexible perspectives were deemed as a significant characteristic of the high level of EI (Petrides *et al.*, 2011). These findings provide empirical evidence to support the link between EI and psychological well-being.

7.4.3 Self-managing psychological well-being and the role of humour

(1) General ways of self-managing psychological well-being

Intrapersonal (managing it alone) and interpersonal (managing it with others) approaches were identified as the two main ways of self-managing psychological well-being. The Intrapersonal Approach was often related to avoidant behaviours. Some participants avoided facing negative emotions by paying attention to other things. This was in accordance with the emotional motivation system that negative emotions generally motivate avoidance behaviour (Isen, 1993; Fazio, Eiser and Shook, 2004). However, these participants added that such avoidant coping had only a short-term effect. In terms of coping with emotional stress from others, participants preferring avoidant coping usually digested problems alone, and simply made apologized, and did not act to solve the problem. In addition, crying was reported as an effective way of releasing negative emotions in the current study.

In contrast, interpersonal solutions were usually related to the tendency to actively solve problems. The most clearly articulated interpersonal approach was seeking social support from important others. Talking with important others could provide richer perspectives, leading to a flexible and positive outlook on adverse events, which is also a way of releasing negative emotions. Talking to friends with similar experiences provided emotional support to participants, suggesting empathy could be helpful with emotion regulation and well-being enhancement. Regarding coping with emotional stress from others, methodical strategies were mentioned as a constructive way, comprising two main actions: reflecting on the situation and the possible cause of the problem, and coping with the stress via

social interaction. Additionally, decision-making depended on the relationship with the target person. They preferred to communicate with their friends, aiming to solve the problem and sustain relationships. Otherwise, they tended to take avoidant behaviours. This suggests their ability to reflect carefully before making decisions. These examples of methodical solutions suggest a combination of intra- and inter-personal processes.

The interpersonal approach and methodical solutions were commonly captured from participants scored high on EI and low on distress in the previous quantitative study. These findings could be lived examples of how those people tend to cope with stress, that is, using adaptive coping with social demands and challenges, coping with stress calmly, thinking before acting, and interacting effectively with people from diverse backgrounds. This also tended to add qualitative evidence to support the AMM. Better emotional skills could enable individuals to adopt effective and purposive coping to produce positive outcomes (Clarke, 2006; Zeidner, Matthews and Shemesh, 2016).

Cultural differences reduced the interactions between home and international students. Some international students said that they could benefit from the social network in their hometown via the internet to cope with stressors. This might be one reason that international students had comparable levels of mental distress to home students in the previous quantitative study. However, using home online social networks might further decrease the interaction between international and

home students, leading to more difficulty in blending in with the locals. This finding reflects one of the features of emerging adults, that is, many of them tend to depend on online social media to gain social support (Arnett, Žukauskienė and Sugimura, 2014).

Additionally, a few participants mentioned they had had regular psychological counselling, which reflects the importance of professional support in university and resonates with the increased demand for counselling services in universities during the recent five years (Thorley, 2017).

(2) The role of humour in self-managing psychological well-being

Humour was found in the present study to be a desirable and wide-ranging construct consisting of personal and situational characteristics, which resonated with much of the previous literature (e.g., Martin et al., 2003). A novel finding related to the functions of humour was found in the current study. Humour was not a very common strategy used in self-managing well-being among university students. No participant mentioned humour in self-managing well-being, until they were asked to give examples of using humour. This finding suggests that humour is more likely to function as an unconscious response to stress in daily life.

Two main ways of intentionally using humour were identified, one was improving communication (interpersonal approach), and the other was regulating their own

emotions (intrapersonal approach). Some students tended to use humorous outlooks when considering negative events, thereby sustaining a positive psychological state, which is consistent with the results of the systematic review in the current thesis and previous quantitative research (e.g., Vernon et al., 2008; Wang et al., 2019). Self-deprecating humour was mentioned as a helpful strategy to adjust emotions in some negative situations, suggesting maladaptive humour was not always detrimental to well-being. Humour was described as a social lubricant that facilitated social interaction, improved relationships, and enriched social networks. Students talked about the “ripple effect” of positive emotions arising from humour, suggesting the wide-range benefits of humour.

Cultural differences especially hindered both using and understanding humour among students with different backgrounds, indicating the need for relevant knowledge when interacting using humour, and the possible reason for the limited use of humour in daily life. The particular style of humour used by every participant from the examples in the current study was not clear, because the four styles are not mutually exclusive. Individuals usually tend to habitually engage with one or multiple styles, but vary in frequency of engagement. Descriptions of improving social interaction and connection were repeatedly captured from high EI participants, providing examples of how they use humour as a buffer in managing well-being.

The current findings suggest that intra- and inter-personal strategies, including

intra- and inter-personal humour, may function as a buffer against stress and adversity. People could benefit from effective coping and social interaction in self-managing their psychological well-being, especially those with a relatively high level of EI. These partially support the AMM (Zeidner, Matthews and Roberts, 2012).

7.4.4 Strengths and limitations

The data were collected from a wide-range sample made up of participants with diverse levels of EI, well-being, and distress. The sample frame balanced gender, and local or international background of students. This helped to ensure the richness of information gained from the data. The current findings add qualitative evidence about emerging adults with different cultural backgrounds, which enriches understanding of this uncertain and unstable development period.

There are limitations in the current study, such that the findings must be interpreted with caution. First, this study was conducted with a relatively small sample of students from one university in Scotland, which may not be fully representative of the wider population. Additional studies with a larger and more diverse sample are warranted. Second, as a cross-sectional study, the current study is unable to be informative about changes and causal inferences. A longitudinal design could be used in the future. Another limitation was that some international students were interviewed in English which is their second language. This might have limited their expression of opinions. As a Chinese student, I

interviewed a few Chinese students in Chinese at their request, which might have improved their expression in the interview. There is also a limitation regarding the reluctance or refusal of some participants. Two qualified participants cancelled their interviews after the appointment time without any reason. Useful information may have been lost due to these missed appointments. By contrast, those who took part in the interview tended to have similar characteristics, such as higher agreeableness, better conscientiousness, and more self-disclosure. These similarities possibly impact on the validity of the study.

7.5 Conclusion

This qualitative study using semi-structured interviews and reflexive thematic analysis provided insights into psychological well-being and humour from the perspectives of university students with a range of characteristics. Overall, psychological well-being was described as a balanced mind state involving internal contentment and positive external experiences, and covering hedonic and eudaimonic perspectives. Outlooks on life events played an important role in explaining positive or negative effects on well-being. Descriptions of psychological well-being reflected some features of emerging adults with different cultural backgrounds, highlighting the need for specific supports for the students during the uncertain and unstable development period. Cultural differences impacted the interaction between students from different backgrounds, especially for students who come from a less multicultural background, and this seemed to

influence their well-being. Both local and international students could benefit from understanding diverse cultures. Humour was commonly described as a contributor to psychological well-being and functioned both consciously and unconsciously. Intra- and inter-personal strategies, including intra- and inter-personal humour, were described as buffers that can be used to self-manage psychological well-being. However, indirect evidence about unconscious humour implied that humour might not be a commonly used strategy for managing well-being. In addition, the findings provided some examples of high EI students managing their well-being by adaptive strategies, including humour, which resonates with the hypothesis of the AMM.

7.6 Chapter summary

This chapter presented the results of qualitative interviews with students purposively recruited from the previous survey. University students provided further insight into the meaning of psychological well-being, self-management of well-being, and the functions of humour. Thematic analysis was adopted in this study. Three main themes were constructed: *meaning of psychological well-being*, *functions of humour*, and *self-managing psychological well-being*.

Chapter 8 Synthesis of findings, conclusions, and future directions

8.1 Overview

This chapter aims to 1) integrate findings from the two stages of the study, thereby advancing our understanding of EI, humour, psychological well-being, and their relationships; 2) compare findings with the AMM and the existing literature; 3) integrate findings of psychological well-being among university students; 4) consider strengths and limitations, and future directions of this research.

8.2 Summary of the two stages of the study

Well-established associations between EI measures and psychological well-being were documented by meta-analysis studies (Schutte *et al.*, 2007; Martins, Ramalho and Morin, 2010). However, empirical studies revealed little about the mechanisms underlying the EI - psychological well-being relationship. Researchers suggested many possible mechanisms for this association, including cognitive processes such as management of coping strategies, and social processes such as seeking social support (Zeidner, Matthews and Roberts, 2012). Humour as a prosocial behaviour, involving affective and cognitive, and inter- and intra-personal processes, has been considered as a potential mediator that may explain the relation between EI and psychological well-being. This thesis began with a systematic review that provided synthesised theoretical and empirical evidence for the association between EI and humour styles. It concluded that trait EI,

especially when assessed by the TEIQue, was more likely to have a closer relationship with humour styles than ability EI; humour might be a process by which EI regulates emotions and manages emotional well-being. The systematic review results informed the subsequent mixed methods study indicating that trait EI, assessed using the TEIQue, should be the focus in the EI - humour - psychological well-being relationship, due to its strong relationship with both health indices and humour styles. Then I moved on to the mixed methods study, consisting of a quantitative study and a qualitative study, which explored the role of humour in the relationship between trait EI and psychological well-being among university students. The quantitative component found that humour styles partially explained the association between trait EI and affective well-being, and the link between trait EI and distress, among university students. In the last phase, the qualitative component identified three main themes, including (1) *meaning of psychological well-being*, (2) *functions of humour*, and (3) *self-managing psychological well-being*. Psychological well-being was described as a balanced state of mind involving contentment and satisfying social relationships. Participants' outlook was found to be a significant contributor to their psychological well-being. University students tended to manage their psychological state either alone, with others, or using humour. Humour was mainly described as contributing to or being a buffer to psychological well-being, and functioned both consciously and unconsciously. Cultural differences were described, especially for international students, as a prominent factor contributing to their psychological well-being, and a barrier in using humour in

daily life. Evidence reflecting features of emerging adulthood was gained. The potential predictive role that EI has in psychological well-being was found throughout the three phases of the study.

8.3 Research questions

To recap, this thesis aimed to understand the mechanisms involved in achieving desirable psychological well-being for university students with different EI levels and humour behaviours. To achieve this purpose, I sought to answer the following research questions (RQ):

Stage 1 systematic review

RQ1-1: what has been found in previous studies about the relationship between ability/trait EI and humour styles among adults in non-clinical settings?

RQ1-2: how do previous studies explain the relationship between ability/trait EI and humour styles among adults in non-clinical settings?

Stage 2 mixed methods study

RQ2: what is the role of humour styles in the relationship between trait EI and psychological well-being among university students and what are their perceptions

regarding the role of humour in psychological well-being?

More specifically, for the quantitative study:

RQ2-1: what is the association between trait EI, humour styles, and psychological well-being?

RQ2-2: how do humour styles mediate the relationship between trait EI and psychological well-being?

For the qualitative study:

RQ2-3: what is the role of humour in psychological well-being among university students?

These research questions were addressed over two stages, including three phases, of research. The three phases of the research and how they related to each other are described in Figure 8.1. In Stage one, a systematic review (Chapter 5) investigated the relationship between EI and humour styles. It found that EI is regularly and positively associated with adaptive humour styles (self-enhancing humour and affiliative humour), and negatively associated in some studies with maladaptive humour styles (self-defeating humour and aggressive humour). Trait EI generally shows closer associations with all humour styles than ability EI,

especially when trait EI is assessed by the TEIQue. Thus, trait EI, assessed by the TEIQue, became the focus of empirical study. In Stage two, a mixed methods study was conducted. The quantitative study (Chapter 6) using PLS-SEM investigated the mediating effect of humour styles between the trait EI - psychological well-being relationship. Participants with high EI were more likely to enhance the use of adaptive humour to facilitate well-being, and to reduce the use of self-defeating humour to relieve distress. The qualitative study used semi-structured interviews and reflective thematic analysis (Chapter 7), with participants purposively recruited from the preceding online study. Insights were gained into how internal and external factors and individuals' outlooks contribute to psychological well-being, how home and international students self-manage their psychological well-being, and how conscious and unconscious humour function in psychological well-being.

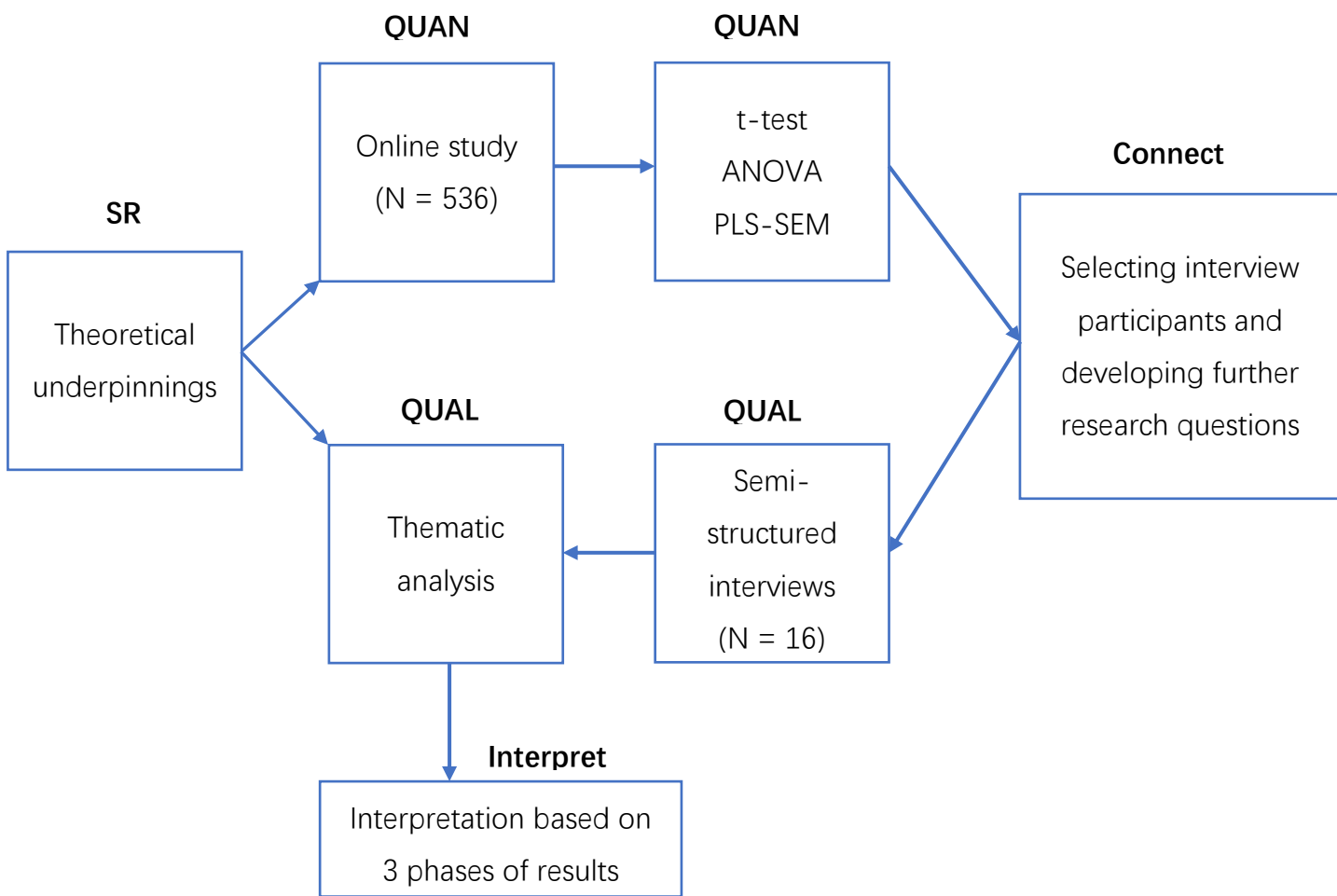


Figure 8-1 Overview of research design.

8.4 Comparison of findings with the Affective Mediation Model

The findings from the research will be compared to the AMM (introduced in Chapter 3 section 3.5). It was judged this model has the best fit with the current research questions, to explain the relationship between EI and psychological well-being. Zeidner *et al.* (2012) hypothesised that both intra- and inter-personal mechanisms can be helpful in understanding this relationship. A range of effective coping strategies and social support were hypothesised as potential mediators. In the current thesis, humour styles were considered as mediating factors that help explain the mechanisms underlying the relationship between EI and psychological well-being. Evidence found from each of the three phases reflecting such mediating processes is discussed in the following.

8.4.1 What is the relationship between ability/trait EI and humour styles?

The systematic review in Stage 1 investigated existing evidence of EI - humour styles relationships with a partial meta-analysis of the correlation between trait EI (measured by TEIQue) and humour styles. This is the first systematic review to synthesise the evidence for this relationship. Humour styles involve both intra- and inter-personal processes, and function as health-promoting or health-damaging constructs in diverse relations with EI. EI was found to be regularly and positively associated with adaptive humour styles (self-enhancing and affiliative humour) and negatively associated in some studies with maladaptive humour

styles (self-defeating and aggressive humour). Trait EI showed more consistent relationships with humour styles than ability EI. However, there was only one included study which tested ability EI, thus this result should be viewed with caution. The partial meta-analysis indicated that all relationships between the TEIQue and the HSQ were significant, although these results might be due to the large sample size. It seems that trait EI, especially when measured by TEIQue, showed the most consistent correlations with humour styles. These results corresponded with the assumptions of the AMM, that is, higher EI is associated with more adaptive coping strategies and greater social competence, which in turn may relate to better psychological well-being. EI is considered as a crucial set of emotional competencies for determining individuals' ways of dealing with emotions and coping with stress, which guides thoughts and actions, motivates or directs behaviours, and may drive others' behaviours through emotional expressions to achieve desirable personal goals (Izard, 2002; Goldenberg, Matheson and Mantler, 2006). The qualitative and quantitative findings from the systematic review add to the literature regarding the link between EI and coping, and the link between EI and social interactions, and suggests subsequent positive associations with psychological well-being, that is, humour may be a process by which EI links to adaptive life outcomes.

The quantitative study in Stage 2 provided empirical evidence about the relationship between trait EI and humour styles. In line with previous studies (Greven *et al.*, 2008; Vernon *et al.*, 2009) outlined in the systematic review, trait

EI and its subscales were positively correlated with all adaptive humour styles; and negatively correlated with all maladaptive humour styles, except for the correlations between aggressive humour and Well-being, and with Sociability. Aggressive humour showed the weakest relationship with humour styles, which is also consistent with previous studies (Vernon *et al.*, 2009; Wang *et al.*, 2019). In addition, extra partial effect size calculations, drawn from three studies (within two articles) in the systematic review in Stage 1 (Greven *et al.*, 2008; Vernon *et al.*, 2009), added quantitative evidence for the correlations between the TEIQue and the HSQ. All correlations between them were found to be significant, although the magnitude was small. These quantitative findings supported previous published studies regarding associations between trait EI and humour styles. Specifically, self-enhancing humour, usually regarded as an emotion regulation or coping mechanism (Martin *et al.*, 1993, 2003), showed the strongest correlations with all trait EI factors and Global EI, which is in line with previous findings that higher scores on trait measures (self-report measures) of EI are more likely to be positively associated with adaptive copings (Bastian, Burns and Nettelbeck, 2005; MacCann *et al.*, 2011). These are reflected the EI - coping link within the AMM.

8.4.2 How do humour styles mediate the relationship between trait EI and psychological well-being?

The mixed methods study provided empirical evidence for the AMM, and provided a more nuanced and comprehensive understanding of the mediation relationship.

The quantitative component tested the trait EI - humour styles - psychological well-being relationship and improved on some of the limitations identified in previous studies, by studying hedonic well-being, eudaimonic well-being, and distress, separately, and deliberately focusing on the population of university students. The positive relationship between trait EI and positive affect was found to be partially mediated by self-enhancing humour; self-defeating humour partially mediated the negative relationship between trait EI and negative affect. High trait EI seemed to facilitate an increase in engaging in self-enhancing humour and a decrease in self-defeating humour, which in turn improved participants' affective well-being. Self-directed humour was more likely to serve as a mechanism through which trait EI benefited affective well-being. In line with the results of Stage 1 systematic review that self-enhancing humour consistently correlated with EI, as an adaptive coping strategy, self-enhancing humour partially explained the trait EI - positive affect relationship. This result supports the hypothesised AMM. Meanwhile, as a maladaptive self-directed humour style, self-defeating humour partially explained the trait EI - negative affect relationship. These two results suggest that the mechanisms underlying the processes between trait EI and positive emotions, and trait EI and distressing emotions, are different. High trait EI individuals are more likely to use adaptive responses to benefit from surroundings and social networks and enhance well-being, and avoid maladaptive responses to reduce negative emotions. These results pointed to the particular processes through which trait EI link to well-being and distress. The quantitative study also found no mediating effect of humour styles between trait EI and life

satisfaction, and eudaimonic well-being. That is, even though both EI and humour styles related to cognitive aspects of well-being, self-directed humour styles might only be one of the processes between trait EI and affective well-being in the current study, which supported the AMM. Previous findings regarding the relationship between EI, humour styles and psychological well-being are mixed. Links with life satisfaction were found in two studies but used the EIS measures (Wang *et al.*, 2019; Huang and Lee, 2019).

A self-defeating humour style partially explained the link between trait EI and anxiety, and depression. Having a measure of high trait EI was associated with decreased use of self-defeating humour, which in turn was linked to a measure of reduced anxiety and depression. People engaging in self-defeating humour tend to ingratiate themselves with others by making fun of their own weaknesses, avoiding facing problems and managing disturbing emotions. Although self-defeating humour was found to be good for psychological well-being in some studies (Ruch and Heintz, 2017; Heintz and Ruch, 2018), it was found to be detrimental in the current study. Affiliative humour, as an adaptive and other-directed humour, partially mediated the link between EI and anxiety. Affiliative humour is associated with interpersonal rewards such as richer social networks, better relationship satisfaction, and less interpersonal conflicts. These adaptive social outcomes were hypothesised as mediating factors in the EI - distress relationship. Affiliative humour could enhance the negative relation between EI and anxiety. The current findings in terms of distress enriched the evidence for

the AMM explaining adaptation to disturbing emotions.

The results of the quantitative study provided supportive evidence for the AMM by investigating the relationship between EI and well-being and EI and distress separately, and adding evidence for treating humour as a specific means of adaptive coping and social competence. The processes underlying the trait EI and psychological well-being relationship were different from the trait EI - distress relationship. Emotionally intelligent individuals were more likely to use adaptive pro-social humour (self-enhancing and affiliative humour) thus relating to better well-being, whereas they avoided using maladaptive humour (self-defeating humour) to deal with disturbing emotions. In addition, these processes currently found in the EI - emotional well-being (including affective well-being and distress) relationship, were not found in the EI - cognitive well-being (including life satisfaction and eudaimonic well-being) relationship. The conclusion is that humour styles could be one of a number of mechanisms by which EI relates to psychological well-being.

8.4.3 What are student perceptions regarding the role of humour in psychological well-being in real life?

A sequential qualitative study provided insight into the role of humour in psychological well-being among home and international students with diverse EI levels in a university context, and detected unconscious humour behaviours. Three

main themes were identified, including *meaning of psychological well-being*, *functions of humour*, and *self-managing psychological well-being*. University students discussed the direct impacts of internal factors (e.g., independence) and external factors (e.g., social context) on their daily psychological well-being. Personal perspectives were captured as an important influencer on the psychological well-being of participants with contradictory views. This suggested that flexible and optimistic outlooks could benefit psychological well-being, which was a feature of high EI individuals. And positive perspectives can also be viewed as one of the functions of self-enhancing humour. This finding might be an example of how emotionally intelligent people manage their psychological well-being through flexible perspectives on their surroundings, which supports the AMM.

University students discussed several ways of self-managing their psychological well-being, which were identified into two main categories, managing it alone (intrapersonal approach), and managing it with others (interpersonal approach). Those who used the intrapersonal approach were more likely to digest problems alone and move attention away from stressors, rather than address problems and stressors. However, students suggested that this way of coping had only short-term effects. Students who were willing to address stressors tended to adopt an interpersonal approach using social supports and social networks. Methodical strategies, a combination of intra- and inter-personal processes, were captured as an effective solution. These intra- and inter-personal solutions and their combination can be considered as ways university students self-manage their

psychological well-being in daily life.

It is worth noticing that no students spontaneously talked about humour (e.g., jokes, witty, comedy, or punchlines) being used as a strategy for managing psychological well-being or improving relationships, until they were asked to give examples of using humour. This might suggest that, humour was not a commonly used means of managing psychological well-being among university students; for another, humour was more likely to function as an unconscious response to circumstances in daily life. In addition, a student gave a vivid story about how she unconsciously used humour to cope with stress in a presentation, and didn't realise the unconscious use of humour until reminded in the interview. Similar to the non-humour ways mentioned above, two ways of intentionally using humour were identified when asked, one was improving communication (interpersonal approach; e.g., lubricant in interactions), and the other was regulating their own emotions (intrapersonal approach; e.g., humorous outlooks). Specifically, self-deprecating use of humour was reported as a helpful strategy to adjust emotions in some negative situations, suggesting maladaptive humour was not always detrimental to psychological well-being. Hence, humour was found to be a not very commonly used means by which university students managed their psychological well-being. In contrast to the general ways of coping, it seems that humour is more likely to be used unconsciously in real life. This is consistent with a daily diary study that found that 70% humour behaviours arise spontaneously during social communications (Martin and Kuiper, 1999). My findings from the qualitative study

provided a more comprehensive understanding of humour behaviours in real life than the quantitative study alone.

Culture and context were found to be important influencers on humour and psychological well-being among university students, especially for international students. Views on humour suggested that humour might be differently used across different contexts and different people, and could be beneficial or detrimental to psychological well-being. For example, a Chinese student, scoring over average on EI, reported that he would use humour with caution in his interactions with local students, although he thought he frequently used humour with Chinese students to improve relationships, and scored high on scales of adaptive humour. This example might imply that scores obtained from the HSQ may not necessarily be translated into behaviours in real life. It depends on the context. Humour, as a coping strategy and lubricant for social interaction, tends to be used with constraint in some contexts. Thus, the situational characteristic of humour requires students to have better emotional skills of understanding, management, and communication, and good knowledge of culture and context, which may facilitate the appropriate use of humour to adjust their emotions and cultivate and maintain relationships with others. Interventions enhancing the understanding of different cultures and contexts and improving emotional skills could benefit students, especially international students, in adapting to their surroundings.

8.4.4 Refined mediation model of EI - psychological well-being relationship

The current research indicated that, the processes underlying the relationship between EI and well-being might be different from the relationship between EI and distress. And the EI - adaptive humour association was stronger than the EI - maladaptive humour association. These findings may imply that the process regarding well-being is different from the process in terms of distress, that is, some mediators may explain the EI - well-being link but not the EI - distress link. For example, self-enhancing humour, as the style most closely related to EI, mediated the link between trait EI and positive affect, but not links regarding negative affect, depression, and anxiety. In addition, self-defeating humour explained all links regarding distress, but did not explain links in terms of well-being. The hypothesised AMM, therefore, might be divided into two sub-models, one focuses on psychological well-being, the other has psychological distress as an outcome variable. For the “well-being model”, high EI might play a protective role for good health and well-being. By contrast, very low EI in the “distress model” might be an important vulnerability factor for a series of psychological problems.

The causal direction between EI and psychological well-being is unclear in general. Further longitudinal research is needed to determine whether EI is a cause or an outcome of psychological well-being. This research suggests that the EI - humour - well-being relationship is possibly different from the EI - humour -distress relationship. And the directions of these two models may also be different from

each other. For example, low EI represented deficiency of emotional ability and lack of confidence to effectively manage emotions and stressors, suggesting low EI is more likely to be a factor in the development of mental health issues, rather than a cause. The direction of relationship in the distress model may be opposite to the well-being model. Further research is needed to test different directions and different potential mediators. Models specifically for mental illness and EI may be hypothesised in the future.

8.5 Psychological well-being among university students

The mixed methods study integrating quantitative and qualitative findings provided evidence of well-being and distress among university students and gained insight into their perceptions regarding psychological well-being. Findings of the quantitative study indicated that the prevalence risks of depression and anxiety in the current study were 37.9% and 23.7%, respectively. These results are comparable to what we know already about prevalence in the university population, that is, about one-third of university students have ongoing mental health problems worldwide (Ibrahim *et al.*, 2013; Auerbach *et al.*, 2018), but were lower than results from a USA sample where 32% of emerging adults felt depressed and 56% felt anxious (Arnett and Schwab, 2012). For findings about well-being, the present participants experienced less positive affect and more negative affect than the general population, but still lie within the normal range (Watson, Clark and Tellegen, 1988). The mean score of life satisfaction

represented an average score for life satisfaction (see Understanding Scores on the Satisfaction with Life Scale, Diener, 2006).

Demographic differences were obtained. As expected from the literature, female students had lower well-being and suffered more distress than male students. However, undergraduate students experienced the highest levels of depression and anxiety, and by contrast, postgraduate research students (PhD) experienced lowest distress. Findings regarding education levels were different from previous studies which indicated that PhD students were at higher risk of having psychological distress or disorder, especially depression, than highly educated individuals in the general population and higher education students (Levecque *et al.*, 2017). In addition, unexpectedly that there was no significant difference between home and international students, regarding both depression and anxiety prevalence.

The results from the qualitative study might help us interpret the quantitative results. Many factors that impact on psychological well-being were obtained from among university students, including academic pressure, financial pressure, self-development, relationships with other students, relationships with important others (e.g., supervisors), cultural differences, physical health, weather, and future uncertainty. Some factors that are commonly found amongst university students during emerging adulthood (Arnett, Žukauskienė and Sugimura, 2014). For example, undergraduate students reported exams as a main stressor,

international students worried about the barriers caused by cultural differences, and graduating students mentioned uncertainty about the future. In addition, international students described that they often benefited from social support from friends in their home country via internet. This might be one of the reasons for international students having a comparable level of distress with home students. And seeking social support by relying on social media was a common feature among emerging adults (Arnett, Žukauskienė and Sugimura, 2014). This result also might be due to the reported adequate support for international students provided by the University, suggesting the importance of student support policies in universities. Furthermore, emerging adulthood is a period of exploring self-identity, developing independence, and establishing stable relationships. Most undergraduate students who were in the early stage of emerging adulthood were more likely to experience more uncertainty, instability, and feeling in-between, than mature students such as post graduate research students. Thus, postgraduate research students may suffer less distress than undergraduate students. Additionally, there was a large overlap between international students and postgraduate students, which might explain the relatively higher psychological well-being among these two groups than expected. It is worth noting that a postgraduate research student scored high on EI, adaptive humour, eudaimonic well-being and distress at the same time. This suggested that a particular temporary stressor, such as difficulties in doing research, might overwhelm students' habitual behaviours in coping with stress in the short-term, but was less likely to impact on their purpose in life. This example implies that

the presence of well-being does not equal the absence of distress.

8.6 Strengths and limitations

The strengths and limitations of each phase of studies in the thesis have been discussed in their respective chapters. The consideration in this section will focus on the thesis, consisting of the systematic review and the mixed methods study, as a whole.

Overall, the thesis aimed to understand the mechanisms involved in achieving desirable psychological well-being for university students with different EI levels and humour behaviours. To understand the relationship between EI, humour, and psychological well-being among university students, involves not only the examination of the mediation relationship, but also the investigation of relationships between each of the two constructs, and how these links relate to real life.

A strength of the thesis is that the integration of findings from the three phases provided evidence of the link between EI and humour styles, and empirical evidence of, and refined the theoretical mediation model for, the EI - psychological well-being relationship. The three-phase study enriched the understanding of the mediating relationship from theoretical, statistical, and lived experience views. The systematic review (phase 1) investigated the existing

evidence of the relationship between EI and humour styles, underpinned the mixed methods study on the subsequent associations with psychological well-being, and indicated that trait EI assessed by TEIQue should be included in the mixed methods study.

The mixed methods study (phase 2 and phase 3) explored the role of humour styles in the relationship between trait EI and psychological well-being among university students and their perceptions regarding the role of humour in psychological well-being. The integration of quantitative and qualitative designs can balance universality and diversity (Maxwell and Mittapalli, 2010). The quantitative design is more likely to produce systematic evidence and general results, and not about particular phenomena and contexts. By contrast, the qualitative method tends to provide nuanced information and be complementary and supplementary to a quantitative study. The quantitative component of the mixed methods study provided statistical evidence for the possible mechanism underlying the mediation relationship in general among university students. However, the situational and unconscious characteristics of humour were neglected due to the nature of the quantitative design. It was unclear how university students with different EI levels use humour to manage their psychological well-being in real life. The sequential qualitative study gained insight into the role of humour in psychological well-being among home and international students, and was supplementary to the findings of the quantitative study by identifying unconscious humour and humour behaviours among students in a multicultural context in the university. Social

interaction and adaptive coping were captured as common ways students self-managed their psychological well-being, and suggested conscious humour might not be frequently used in daily life. Hence, the integration of three study designs provided a nuanced and comprehensive understanding of the mediation relationship between EI, humour, and psychological well-being among university students.

Another strength is the focus of psychological well-being among a particular population i.e. university students. The integration of quantitative and qualitative findings reported the current situation of well-being and distress among university students, and corresponding impactors and possible reasons. This design enabled the study of different facets of psychological well-being among university students and captured a deeper understanding of this topic. The findings of the qualitative study help to explain the unexpected quantitative results, such as the explanation of the unexpected better psychological well-being among postgraduate research and international students. In addition, psychological well-being was studied as well-being and distress separately and differences between the “well-being model” and the “distress model” were detected. The role of humour styles also differed in the EI - well-being link and in the EI - distress link. These findings could help to improve the AMM, and contribute to the development of new models such as an individual model specifically focusing on distress and disorder.

There are limitations to this thesis. First, comparison of the mediation relationship

between home and international students was not conducted due to the following practical constraint. The final sample consisted of 179 international students and 357 home students. The number of home students is more than 50% larger in size than the number of international students. This large difference tends to lead to bias in the results of the statistical tests of multiple-group analysis. Second, the causal relationships between EI, humour, and psychological well-being remain unclear. To what extent low EI and maladaptive humour are associated with vulnerability factors for poor well-being and mental distress, and whether low EI and maladaptive humour contribute to mental distress, or are outcomes of mental distress, are not clear. Likewise, protective mechanisms associated with adaptive humour also can be an outcome of positive emotions. Thirdly, this was a cross-sectional rather than a longitudinal study because international postgraduate students are aiming to graduate within one academic year. Data were collected at the start of semester 2 teaching in order to allow international students to adapt to life and study in Scotland, about three months after enrolment. A longitudinal design usually requires at least three time points, which would make it difficult or impossible to give most international students a third assessment. The fourth limitation is that students in only one University were studied. For example, some universities may not have many students from diverse cultural backgrounds. Finally, the thesis explored only one of several possible mediators, that is, humour styles. The effects of other mediators or moderators, such as social support, remain unclear.

8.7 Future directions

When considering further research, the causal status of EI and psychological well-being requires substantial longitudinal studies, to determine whether EI is a cause or an outcome of psychological well-being, especially the association between EI and distress. Similarly, the causal status of EI and humour, and of humour and psychological well-being need to be investigated, particularly the causal association regarding maladaptive humour. In addition, the differences detected between the mediation relationships about well-being and about distress in this research suggested that the causal status of well-being might differ from that of distress. For example, inadequate emotional competence and detrimental use of humour might be consequences of mental disorders, by contrast, well-being and positive emotions are more likely to be the fruit of better emotional competence and effective use of prosocial humour. A mixed-methods design involving a longitudinal study may provide a more in-depth understanding of these relationships. Clarifying these causal associations may benefit the development of tailored interventions particularly for enhancing well-being or reducing distress, improve the understanding of these constructs in positive psychology, and refine the AMM separately focusing on distress or well-being.

Secondly, more attention could be drawn to research about maladaptive humour styles. Self-defeating humour was found to be detrimental to psychological well-being in the quantitative study, however, it was found to be sometimes beneficial

for psychological well-being in the qualitative interviews. As discussed in Chapter 3, maladaptive humour styles are not always detrimental to health, and simple correlations between each humour style and health indices might be misleading. Further research could study the combinations of humour styles and to explore whether combinations may play a role in the mediation model. Inconsistent relationships between EI and aggressive humour were found in the systematic review, suggesting EI measures and their sub-scales may not be able to appropriately separate affective and cognitive empathy. Further studies could investigate more about how EI components involve affective and cognitive empathy thus enhancing the understanding of both constructs and improving EI measures. Meanwhile, further research may explore how aggressive humour involves reactive or proactive aggression and so enhances the knowledge of aggressive behaviours.

Thirdly, humour behaviours were found to be unconscious and context-sensitive in the qualitative interviews, further research could extend the current study by exploring conscious and unconscious humour in other contexts. For example, a mixed methods study containing semi-structured interviews or focus groups could be conducted among professionals in the context of the workplace such as teachers in school, or in the context of Eastern culture.

In the fourth place, the role of potential moderating factors such as students' gender and origins (e.g., home and international students), and other mediating

factors such as specific coping and social competence, needs more exploration, and future work should systematically investigate these factors. Further research could also explore the mediation relationship between specific EI components, humour styles/humour combinations, and indicators of health and well-being.

Finally, the scope of the research sample needs to be extended. For example, future research could be conducted in clinical settings to determine whether processes between EI and psychological well-being are different between people with established mental illness diagnoses. Different age groups in the general population should be studied.

In terms of the practical implications of this research, future directions can be considered in two ways. Firstly, tailored interventions or training programmes could be developed that include understanding of using humour. Due to the mediation relationship between EI, humour, and psychological well-being, interventions or training aiming to improve EI may include coaching about the use of humour as part of the methods used by a therapist, consequently improving psychological well-being, and addressing the specific needs of a particular population. For example, interventions could be designed to fit the features of emerging adults, for example, facilitating the use of self-enhancing humour may enhance EI, and reducing the use of self-defeating humour may relieve the anxiety caused by uncertainty during emerging adulthood. Interventions incorporating humour, especially adaptive humour, may be more effective than directly

improving EI or psychological well-being. Considering the different mediating relationships regarding well-being and distress, specific interventions can be designed particularly to enhance well-being or reduce distress. For example, fostering the use of self-enhancing humour may be more effective in improving well-being rather than reducing distress, whereas minimising the use of self-defeating humour may be a better way of relieving distress.

Humour-centred interventions or training could be designed to foster appropriate use of humour in different contexts in order to address the particular needs of people with different humour styles. Given that the maladaptive effect of self-defeating humour was found to be reduced when it was used in combination with other humour styles (Fox, Hunter and Jones, 2016), and self-defeating humour was found to be helpful in the present qualitative study, interventions could be designed to help enhance the combined use of humour to reduce the negative effect of maladaptive humour. Although findings of changing unconscious mental processes and states are mixed (Devine *et al.*, 2012; Kelly *et al.*, 2014; Noon, 2018; Bastick, 2021), raising awareness of using humour as an adaptive strategy in daily life can be applied among university students.

Secondly, this research provides insight into the psychological adaptation of university students in a university with cultural diversity. Cultural differences were captured as a barrier to social interaction between students from different backgrounds, especially for international students, and impacted on students'

psychological well-being. These findings may guide activities and policies regarding cultural integration in universities. For instance, organising multicultural workshops and events to provide both home and international students with opportunities for cultural exchange, to reduce cultural barriers in social interactions, and advance the social network between international students and home students. Additionally, universities or student organisations could arrange activities that explore and use humour. For example, a participant in the interview suggested that stand-up comedy, inviting students from various cultural backgrounds may facilitate culture exchange and enrich social networks in a relaxed and happy atmosphere using humour as a strategy. This could facilitate students gaining cross-cultural humour skills for use in future social interactions.

8.8 Conclusion

This thesis provides evidence for the mechanisms involved in achieving desirable psychological well-being for university students with different EI levels and humour behaviours. The mediation relationship between EI, humour, and psychological well-being among university students was examined. A systematic review with a partial meta-analysis, combining with a mixed methods study consisting of a quantitative study and a sequential qualitative study, was conducted and provided a nuanced understanding of this mediation relationship.

The possible explanations of the association between ability/trait EI and humour styles suggested by the systematic review, supported the associations between EI and adaptive and socially desirable humour behaviours, as well as the negative relationship with maladaptive behaviours. Trait EI was found to have a stronger relationship with humour styles than ability EI. Humour styles, containing adaptive and maladaptive functions and intra- and inter-personal processes, were found to partially mediate the relationship between trait EI and affective well-being (positive and negative affects) and distress (anxiety and depression) among university students, separately. Quantitative findings supported the hypotheses of the AMM that intra- and inter-personal processes might be mechanisms by which EI relates to psychological well-being. The sequential qualitative study gained insight into the role of humour in self-managing psychological well-being among home and international students with diverse EI levels in a university context, and revealed humour is more likely to function unconsciously in real life. Adaptive coping, social interaction, and their combination were captured as common means by which university students manage their psychological well-being, suggesting humour might not be a frequently used strategy in real life. These qualitative findings added examples from real life to support the AMM that coping strategies and social competence are related to psychological well-being. Furthermore, findings suggested that the AMM might be refined into two sub-models, one for EI and well-being, the other for EI and distress.

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Appendices

Appendix 1: Ethic approval letter

Appendix 2: Participant information



PARTICIPANT INFORMATION SHEET

1. Study title

The effect of humour on the relationship between emotional intelligence and psychological well-being

2. Invitation paragraph

You are being invited to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. If you decide to take part in this study, you can keep a copy of this Participant Information Sheet and the consent form now via online survey.

3. What is the purpose of the study?

The purposes of this study are to explore the psychological well-being and the prevalence of mental health problems in university students and to investigate the effect of humor on the relationship between emotional intelligence and mental well-being/health. The current study started on October 2018 and is expected to be completed by end of September 2021.

4. Why have I been invited to participate?

You have been invited to take part in this study because you are a current student at

University of Glasgow.

5. Do I have to take part?

No, it is up to you to decide whether or not to take part. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part, you are still free to withdraw at any time and without giving a reason. A decision not to participate will not affect your grades in any way.

6. What will happen to me if I take part?

All current students in College of Medical, Veterinary & Life Sciences and in College of Social Sciences, will be invited to take part in this study. This study consists of two parts, questionnaire, and interview. You can choose to only complete the questionnaire or both the questionnaire and the interview. It will take 20 minutes to complete the questionnaire online. If you volunteer to participate in a follow up interview (face-to-face or skype), it will take you an additional 20 minutes. A recording will be made of the interview. The process of disclosing personal or distressing information to the research team might be upsetting. We recommend the website, [Helping Distressed Students: A Guide for University Staff](https://www.gla.ac.uk/myglasgow/staff/helpingdistressedstudents/) (<https://www.gla.ac.uk/myglasgow/staff/helpingdistressedstudents/>) if you feel distressed.

Your data will be given a code so that it does not directly identify you. Your data will be kept for a maximum of 10 years from the end of the study. Any data remaining at that time will be deleted. If you agree, your data may also be used for future research. For example, research related to the study to improve scientific understanding. Should this occur, you won't be contacted. We will always ask for approval for this research from an independent ethics committee or independent review board. You can choose not to allow these optional analyses and still be in this study.

7. What do I have to do?

Please complete these questionnaires on your own and in quiet conditions. There are no right or wrong answers. Work quickly, and don't think too long about the exact meaning of the statements. Try to answer as accurately as possible.

8. What are the possible disadvantages and risks of taking part?

The process of disclosing personal or distressing information in questionnaires might be upsetting. We recommend the website, [Helping Distressed Students: A Guide for University Staff](https://www.gla.ac.uk/myglasgow/staff/helpingdistressedstudents/) (<https://www.gla.ac.uk/myglasgow/staff/helpingdistressedstudents/>) if you feel distressed.

9. What are the possible benefits of taking part?

You will receive no direct benefit from taking part in this study. The information that is collected during this study will give us a better understanding of psychological conditions in university students and the effect of social interpersonal factors on well-being and this may help students in the future.

10. Will my taking part in this study be kept confidential?

All information which is collected about you, or responses that you provide, during the course of the research will be kept strictly confidential. You will be identified by an ID number, and any information about you will have your name and address removed so that you cannot be recognised from it. Please note that assurances on confidentiality will be strictly adhered to unless evidence of serious harm, or risk of serious harm, is uncovered. In such cases, the University may be obliged to contact relevant statutory bodies/agencies.

Any data in paper form will be stored in locked cabinets in rooms with restricted access at the University of Glasgow. All data in electronic format will be stored on secure password-protected computers. No one outside of the research team or appropriate governance staff will be able to find out your name, or any other information which could identify you.

11. What will happen to my data?

We may be collecting and storing identifiable information from you in order to undertake this study. This means that the University is responsible for looking after your information and using it properly. We may keep identifiable information about you (for 10 years after the study has finished) and will not pass this information to a third party without your express permission.

Your rights to access, change or move the information we store may be limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, we will keep the information about you that we have already obtained. To safeguard your rights, we will use the minimum personally-identifiable information possible. You can find out more about how we use your information from section 15.

Researchers from the University of Glasgow collect, store and process all personal information in accordance with the General Data Protection Regulation. All study data will be held in accordance with The General Data Protection Regulation.

The data will be stored in archiving facilities in line with the University of Glasgow retention policy of up to 10 years. After this period, further retention may be agreed or your data will be securely destroyed in accordance with the relevant standard procedures.

Your identifiable information might be shared with people who check that the study is done properly and, if you agree, in coded form with other organisations or universities to carry out research to improve scientific understanding. Your data will form part of the study result that will be published in expert journals, presentations, student dissertations/theses (if applicable) and on the internet for other researchers to use. Your name will not appear in any publication.

12. What will happen to the results of the research study?

The results of the research will be used to fulfil the requirement of a PhD at University of Glasgow. Also, the research team plans to present them in conferences and publish them in academic journals. The results are likely to be published in relevant academic journals by the end of 2021. Anonymized answers from interview may be directly quoted in resulting publications or reports.

13. Who is organising and funding the research?

This is a self-funded research.

14. Who has reviewed the study?

The project has been reviewed by the College of Medical, Veterinary & Life Sciences Ethics Committee.

15. Contact for Further Information

Rong Xing

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General Practice and Primary Care,

Institute of Health and Wellbeing,

University of Glasgow,

1, Horselethill Road,

Glasgow,

G12 9LX

Many thanks for your time and interest.

Appendix 3: Consent forms for survey and interview



Centre Number:

Project Number:

Participant Identification Number for this trial:

Title of Project: The effect of humour on the relationship between emotional intelligence and psychological well-being

Name of Researcher(s): Rong Xing

CONSENT FORM FOR SURVEY

Please
initial box

I confirm that I have read and understood the Participant Information Sheet version 1.1 dated 31/07/2018.

I have had the opportunity to think about the information and ask questions, and understand the answers I have been given.

I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my legal rights being affected.

I confirm that I agree to the way my data will be collected and processed and that data will be stored for up to 10 years in University archiving facilities in accordance with relevant Data Protection policies and regulations.

I understand that all data and information I provide will be kept confidential and will be seen only by study researchers and regulators whose job it is to check the work of researchers.

I agree that my name, contact details and data described in the information sheet will be kept for the purposes of this research project.

I understand that if I withdraw from the study, my data collected up to that point will be retained and used for the remainder of the study.

I agree to take part in the study.

I agree that the information I provide will be archived in Enlighten: Research Data, the University of Glasgow's institutional data repository, and available to share for future research project in a completely anonymous format.



Centre Number:

Project Number:

Participant Identification Number for this trial:

Title of Project: The effect of humour on the relationship between emotional intelligence and psychological well-being

Name of Researcher(s): Rong Xing

CONSENT FORM FOR INTERVIEW

Please
initial box

I agree to my interview being audio-recorded.

I understand that the recorded interview will be transcribed word by word and the transcription stored for up to 10 years in University archiving facilities in accordance with Data Protection policies and regulations.

I understand that my information and things that I say in an interview may be quoted in reports and articles that are published about the study, but my name or anything else that could tell people who I am will not be revealed.

I agree for the data I provide to be anonymously archived in the UK data archive or other approved archiving facilities, and that other researchers can have access to this data only if they have scientific and ethical approval, and agree to preserve the confidentiality of this information as set out in this form.

I agree that should significant concerns regarding my mental or physical health arise during my participation in the study that a member of an appropriate clinical team will be immediately informed.

I understand that any criminal acts which come to light as a result of my participation in this study may have to be reported appropriately to the relevant authorities by the research team.

I agree that the information I provide will be archived in Enlighten: Research Data, the University of Glasgow's institutional data repository, and available to share for future research project in a completely anonymous format.

Name of participant	Date	Signature
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Name of Person taking consent (if different from researcher)	Date	Signature
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Rong Xing Researcher	Date	Signature
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(1 copy for participant; 1 copy for researcher)

Appendix 4: Cover letter for survey

Dear Participant,

I am a PhD student in General Practice and Primary Care, Institute of Health and Wellbeing. I am conducting a study to explore how humor and emotional intelligence influence people's psychological well-being. The survey is completely anonymous and will take approximately 20 minutes to complete. **To take part please click on the link below:**

<https://glasgow-research.onlinesurveys.ac.uk/ei-hs-wb1>

Survey respondents will have the chance to win £100 voucher! If you want to be informed about your personal result and take part in an interview about the strategies of humor and emotional intelligence, enter your email address before submitting.

More information can be found in the attachment. If you have any questions or concerns about participating in this study, you may contact me at r.xing.1@research.gla.ac.uk

Thank you for your assistance with this research.

Yours Sincerely,

Rong Xing

Doctoral student

General Practice and Primary Care, Institute of Health and Wellbeing

College of Medical, Veterinary & Life Sciences

University of Glasgow

Appendix 5: Invitation for interview

Dear Participant,

I hope this email finds you well. You kindly took part in an online survey last year about how humour and emotional intelligence influence people's psychological well-being. You had let us know you would be willing to be approached to take part in a follow up interview. After your interview and if you would like, I can access and give you a summary of your online survey results, but I would only do this if you want. Also in appreciation of the additional time you have given up to take part in the interview I have a small gift.

If you opt to take part, the interview will take no more than 30 minutes. I am trying to get insights into your views on humour and emotional intelligence. There are no right or wrong answers to this - I am keen to gain a wide variety of experiences. Your responses to the questions will be kept confidential.

I would like to do your interview via Skype. Could you please provide me with your preferred times according to the time slot in attachment?

If you have any questions or concerns about participating in this study, you may contact me at r.xing.1@research.gla.ac.uk

Thank you and I look forward to hearing from you.

Yours Sincerely,

Rong Xing

Doctoral student

General Practice and Primary Care, Institute of Health and Wellbeing

College of Medical, Veterinary & Life Sciences

University of Glasgow

Appendix 6: Questionnaires for survey

By ticking the tick box below, I confirm that:


- I confirm that I have read and understood the Participant Information Sheet version 1.1 dated 31/07/2018.
- I have had the opportunity to think about the information and ask questions, and understand the answers I have been given.
- I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my legal rights being affected.
- I confirm that I agree to the way my data will be collected and processed and that data will be stored for up to 10 years in University archiving facilities in accordance with relevant Data Protection policies and regulations.
- I understand that all data and information I provide will be kept confidential and will be seen only by study researchers and regulators whose job it is to check the work of researchers.
- I agree that my name, contact details and data described in the information sheet will be kept for the purposes of this research project.
- I understand that if I withdraw from the study, my data collected up to that point will be retained and used for the remainder of the study.
- I understand that if I express interest in taking part in the study interview I can be contacted by the researcher.
- I agree that the information I provide will be archived in Enlighten: Research Data, the University of Glasgow's institutional data repository, and available to share for future research project in a completely anonymous format.

Please tick this box to confirm that you have read the participant information sheet and above statement and are happy to take part in this study.

About you

Please note that in this section you are occasionally asked to ✎ write in your answer.

<p>What is your gender?</p> <p><input type="checkbox"/> MALE</p> <p><input type="checkbox"/> FEMALE</p> <p><input type="checkbox"/> Other</p> <p>Please specify ✎</p>	<p>What is your year of birth?</p> <p>✎</p>	<p>Was your upbringing mainly in</p> <p><input type="checkbox"/> Large City <input type="checkbox"/> Town</p> <p><input type="checkbox"/> Village <input type="checkbox"/> Other</p>
<p>What is your natural hand for writing?</p> <p><input type="checkbox"/> RIGHT <input type="checkbox"/> LEFT</p>	<p>Your birth order? (e.g. 1st, 2nd child)</p> <p><input type="checkbox"/> 1st <input type="checkbox"/> 2nd <input type="checkbox"/> 3rd</p> <p><input type="checkbox"/> 4th <input type="checkbox"/> 5th <input type="checkbox"/> 6th</p>	<p>Your marital status?</p> <p><input type="checkbox"/> Single</p> <p><input type="checkbox"/> Living together</p> <p><input type="checkbox"/> Married, no children in education</p> <p><input type="checkbox"/> Married with children in education</p> <p><input type="checkbox"/> Divorced/ Separated</p> <p><input type="checkbox"/> Widowed</p> <p><input type="checkbox"/> Other</p>
<p>Is English your native language?</p> <p><input type="checkbox"/> YES <input type="checkbox"/> NO</p>	<p>Your current education?</p> <p><input type="checkbox"/> BA/BSc or similar</p> <p><input type="checkbox"/> MA/MSc or similar</p> <p><input type="checkbox"/> MBA</p> <p><input type="checkbox"/> PhD</p> <p><input type="checkbox"/> Other</p> <p>Year of study?</p> <p>✎</p>	<p>What subject are you studying?</p> <p>✎</p>
<p>Are you an international student (non-UK/EU)?</p> <p><input type="checkbox"/> YES <input type="checkbox"/> NO</p> <p>Your nationality?</p> <p>✎</p>	<p>How would you describe yourself ethnically?</p> <p><input type="checkbox"/> White - UK heritage</p> <p><input type="checkbox"/> White - other</p> <p><input type="checkbox"/> Pakistani</p> <p><input type="checkbox"/> Bangladeshi</p> <p><input type="checkbox"/> Indian</p>	<p>Which religion would you say you most closely identify now?</p> <p><input type="checkbox"/> Christian - Protestant</p> <p><input type="checkbox"/> Christian - Catholic</p> <p><input type="checkbox"/> Christian - Other</p> <p><input type="checkbox"/> Muslim</p> <p><input type="checkbox"/> Hindu</p> <p><input type="checkbox"/> Jewish</p>

	<input type="checkbox"/> Black - African heritage <input type="checkbox"/> Black - Caribbean heritage <input type="checkbox"/> Chinese <input type="checkbox"/> Other	<input type="checkbox"/> Buddhist <input type="checkbox"/> Other belief system <input type="checkbox"/> None at all
Have you joined any student organization, sports team or student union? <input type="checkbox"/> NO <input type="checkbox"/> YES Please specify 		

The Positive and Negative Affect Schedule

This scale consists of a number of words that describe different feelings and emotions. Read each item and then list the number from the scale below next to each word. **Indicate to what extent you feel this way right now, that is, at the present moment OR indicate the extent you have felt this way over the past week.**

1	2	3	4	5
Very Slightly	A Little	Moderately	Quite a Bit	Extremely
or Not at All				
_____		1. Interested	_____	11. Irritable
_____		2. Distressed	_____	12. Alert
_____		3. Excited	_____	13. Ashamed
_____		4. Upset	_____	14. Inspired
_____		5. Strong	_____	15. Nervous
_____		6. Guilty	_____	16. Determined
_____		7. Scared	_____	17. Attentive
_____		8. Hostile	_____	18. Jittery
_____		9. Enthusiastic	_____	19. Active
_____		10. Proud	_____	20. Afraid

Satisfaction with life scale

Below are five statements that you may agree or disagree with. Using the 1 - 7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding.

- 7 - Strongly agree
- 6 - Agree
- 5 - Slightly agree
- 4 - Neither agree nor disagree
- 3 - Slightly disagree
- 2 - Disagree
- 1 - Strongly disagree

___ In most ways my life is close to my ideal.

___ The conditions of my life are excellent.

___ I am satisfied with my life.

___ So far I have gotten the important things I want in life.

___ If I could live my life over, I would change almost nothing.

Nine-symptom Checklist

Over the last 2 weeks , how often have you been bothered by any of the following problems?	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

If you checked off **any** problems, how **difficult** have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Seven-symptom Checklist

Over the last 2 weeks , how often have you been bothered by any of the following problems?	Not at all	Several days	More than half the days	Nearly every day
1. Feeling nervous, anxious or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it is hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3

If you checked off **any** problems, how **difficult** have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Scales of Psychological Well-Being

The following set of questions deals with how you feel about yourself and your life. Please remember that there are no right or wrong answers.

Circle the number that best describes your present agreement or disagreement with each statement.	Strongly	Disagree	Disagree	Agree	Agree	Strongly
	Disagree	Somewha t	Slightly	Slightly	Somewha t	Agree
1. I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people.	1	2	3	4	5	6
2. In general, I feel I am in charge of the situation in which I live.	1	2	3	4	5	6
3. I am not interested in activities that will expand my horizons.	1	2	3	4	5	6
4. Most people see me as loving and affectionate.	1	2	3	4	5	6
5. I live life one day at a time and don't really think about the future.	1	2	3	4	5	6
6. When I look at the story of my life, I am pleased with how things have turned out.	1	2	3	4	5	6
7. My decisions are not usually influenced by what everyone else is doing.	1	2	3	4	5	6
8. The demands of everyday life often get me down.	1	2	3	4	5	6

Circle the number that best describes your present agreement or disagreement with each statement.	Strongly	Disagree	Disagree	Agree	Agree	Strongly
	Disagree	Somewha t	Slightly	Slightly	Somewha t	Agree
9. I think it is important to have new experiences that challenge how you think about yourself and the world.	1	2	3	4	5	6
10. Maintaining close relationships has been difficult and frustrating for me.	1	2	3	4	5	6
11. I have a sense of direction and purpose in life.	1	2	3	4	5	6
12. In general, I feel confident and positive about myself.	1	2	3	4	5	6
13. I tend to worry about what other people think of me.	1	2	3	4	5	6
14. I do not fit very well with the people and the community around me.	1	2	3	4	5	6
15. When I think about it, I haven't really improved much as a person over the years.	1	2	3	4	5	6
16. I often feel lonely because I have few close friends with whom to share my concerns.	1	2	3	4	5	6
17. My daily activities often seem trivial and unimportant to me.	1	2	3	4	5	6
18. I feel like many of the people I know have gotten more out of life than I have.	1	2	3	4	5	6

Circle the number that best describes your present agreement or disagreement with each statement.	Strongly	Disagree	Disagree	Agree	Agree	Strongly
	Disagree	Somewha t	Slightly	Slightly	Somewha t	Agree
19. I tend to be influenced by people with strong opinions.	1	2	3	4	5	6
20. I am quite good at managing the many responsibilities of my daily life.	1	2	3	4	5	6
21. I have a sense that I have developed a lot as a person over time.	1	2	3	4	5	6
22. I enjoy personal and mutual conversations with family members or friends.	1	2	3	4	5	6
23. I don't have a good sense of what it is I'm trying to accomplish in life.	1	2	3	4	5	6
24. I like most aspects of my personality.	1	2	3	4	5	6
25. I have confidence in my opinions, even if they are contrary to the general consensus.	1	2	3	4	5	6
26. I often feel overwhelmed by my responsibilities.	1	2	3	4	5	6
27. I do not enjoy being in new situations that require me to change my old familiar ways of doing things.	1	2	3	4	5	6
28. People would describe me as a giving person, willing to share my time with others.	1	2	3	4	5	6

Circle the number that best describes your present agreement or disagreement with each statement.	Strongly	Disagree	Disagree	Agree	Agree	Strongly
	Disagree	Somewha t	Slightly	Slightly	Somewha t	Agree
29. I enjoy making plans for the future and working to make them a reality.	1	2	3	4	5	6
30. In many ways, I feel disappointed about my achievements in life.	1	2	3	4	5	6
31. It's difficult for me to voice my own opinions on controversial matters.	1	2	3	4	5	6
32. I have difficulty arranging my life in a way that is satisfying to me.	1	2	3	4	5	6
33. For me, life has been a continuous process of learning, changing, and growth.	1	2	3	4	5	6
34. I have not experienced many warm and trusting relationships with others.	1	2	3	4	5	6
35. Some people wander aimlessly through life, but I am not one of them.	1	2	3	4	5	6
36. My attitude about myself is probably not as positive as most people feel about themselves.	1	2	3	4	5	6
37. I judge myself by what I think is important, not by the values of what others think is important.	1	2	3	4	5	6
38. I have been able to build a home and a lifestyle for myself that is much to my liking.	1	2	3	4	5	6

Circle the number that best describes your present agreement or disagreement with each statement.	Strongly	Disagree	Disagree	Agree	Agree	Strongly
	Disagree	Somewha t	Slightly	Slightly	Somewha t	Agree
39. I gave up trying to make big improvements or changes in my life a long time ago.	1	2	3	4	5	6
40. I know that I can trust my friends, and they know they can trust me.	1	2	3	4	5	6
41. I sometimes feel as if I've done all there is to do in life.	1	2	3	4	5	6
42. When I compare myself to friends and acquaintances, it makes me feel good about who I am.	1	2	3	4	5	6

Humour Styles Questionnaire

People experience and express humour in many different ways. Below is a list of statements describing different ways in which humour might be experienced. Please read each statement carefully, and indicate the degree to which you agree or disagree with it. Please respond as honestly and objectively as you can. There are no right or wrong answers.

	Totally Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Totally Agree
	1	2	3	4	5	6	7
1. I usually don't laugh or joke around much with other people.	1	2	3	4	5	6	7
2. If I am feeling depressed, I can usually cheer myself up with humor.	1	2	3	4	5	6	7
3. If someone makes a mistake, I will often tease them about it.	1	2	3	4	5	6	7
4. I let people laugh at me or make fun at my expense more than I should.	1	2	3	4	5	6	7
5. I don't have to work very hard at making other people laugh -- I seem to be a naturally humorous person.	1	2	3	4	5	6	7
6. Even when I'm by myself, I'm often amused by the absurdities of life.	1	2	3	4	5	6	7
7. People are never offended or hurt by my sense of humor.	1	2	3	4	5	6	7
8. I will often get carried away in putting myself down if it makes my family or friends laugh.	1	2	3	4	5	6	7
9. I rarely make other people laugh by telling funny stories about myself.	1	2	3	4	5	6	7
10. If I am feeling upset or unhappy I usually try to think of something funny about the situation to make myself feel better.	1	2	3	4	5	6	7

	Totally Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Totally Agree
	1	2	3	4	5	6	7
11. When telling jokes or saying funny things, I am usually not very concerned about how other people are taking it.	1	2	3	4	5	6	7
12. I often try to make people like or accept me more by saying something funny about my own weaknesses, blunders, or faults.	1	2	3	4	5	6	7
13. I laugh and joke a lot with my friends.	1	2	3	4	5	6	7
14. My humorous outlook on life keeps me from getting overly upset or depressed about things.	1	2	3	4	5	6	7
15. I do not like it when people use humor as a way of criticizing or putting someone down.	1	2	3	4	5	6	7
16. I don't often say funny things to put myself down.	1	2	3	4	5	6	7
17. I usually don't like to tell jokes or amuse people.	1	2	3	4	5	6	7
18. If I'm by myself and I'm feeling unhappy, I make an effort to think of something funny to cheer myself up.	1	2	3	4	5	6	7
19. Sometimes I think of something that is so funny that I can't stop myself from saying it, even if it is not appropriate for the situation.	1	2	3	4	5	6	7
20. I often go overboard in putting myself down when I am making jokes or trying to be funny.	1	2	3	4	5	6	7

Totally Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Totally Agree			
1	2	3	4	5	6	7			
21. I enjoy making people laugh.			1	2	3	4	5	6	7
22. If I am feeling sad or upset, I usually lose my sense of humor.			1	2	3	4	5	6	7
23. I never participate in laughing at others even if all my friends are doing it.			1	2	3	4	5	6	7
24. When I am with friends or family, I often seem to be the one that other people make fun of or joke about.			1	2	3	4	5	6	7
25. I don't often joke around with my friends.			1	2	3	4	5	6	7
26. It is my experience that thinking about some amusing aspect of a situation is often a very effective way of coping with problems.			1	2	3	4	5	6	7
27. If I don't like someone, I often use humor or teasing to put them down.			1	2	3	4	5	6	7
28. If I am having problems or feeling unhappy, I often cover it up by joking around, so that even my closest friends don't know how I really feel.			1	2	3	4	5	6	7
29. I usually can't think of witty things to say when I'm with other people.			1	2	3	4	5	6	7
30. I don't need to be with other people to feel amused -- I can usually find things to laugh about even when I'm by myself.			1	2	3	4	5	6	7
31. Even if something is really funny to me, I will not laugh or joke about it if someone will be offended.			1	2	3	4	5	6	7
32. Letting others laugh at me is my way of			1	2	3	4	5	6	7

Totally Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Totally Agree
1	2	3	4	5	6	7
keeping my friends and family in good spirits.						

Trait Emotional Intelligence Questionnaire

Please answer each statement below by putting a circle around the number that best reflects your degree of agreement or disagreement with that statement. Do not think too long about the exact meaning of the statements. Work quickly and try to answer as accurately as possible. There are no right or wrong answers.

	1	2	3	4	5	6	7
Completely Disagree							Completely Agree
1. Expressing my emotions with words is not a problem	1	2	3	4	5	6	7
2. I often find it difficult to see things from another person's viewpoint.	1	2	3	4	5	6	7
3. On the whole, I'm a highly motivated person.	1	2	3	4	5	6	7
4. I usually find it difficult to regulate my emotions.	1	2	3	4	5	6	7
5. I generally don't find life enjoyable.	1	2	3	4	5	6	7
6. I can deal effectively with people.	1	2	3	4	5	6	7
7. I tend to change my mind frequently.	1	2	3	4	5	6	7
8. Many times, I can't figure out what emotion I'm feeling.	1	2	3	4	5	6	7
9. I feel that I have a number of good qualities.	1	2	3	4	5	6	7
10. I often find it difficult to stand up for my rights.	1	2	3	4	5	6	7
11. I'm usually able to influence the way other people	1	2	3	4	5	6	7

	1.....	2.....	3.....	4.....	5.....	6.....	7	
	Completely Disagree				Completely Agree			
feel.								
12. On the whole, I have a gloomy perspective on most things.	1	2	3	4	5	6	7	
13. Those close to me often complain that I don't treat them right.	1	2	3	4	5	6	7	
14. I often find it difficult to adjust my life according to the circumstances.	1	2	3	4	5	6	7	
15. On the whole, I'm able to deal with stress.	1	2	3	4	5	6	7	
16. I often find it difficult to show my affection to those close to me.	1	2	3	4	5	6	7	
17. I'm normally able to "get into someone's shoes" and experience their emotions.	1	2	3	4	5	6	7	
18. I normally find it difficult to keep myself motivated.	1	2	3	4	5	6	7	
19. I'm usually able to find ways to control my emotions when I want to.	1	2	3	4	5	6	7	
20. On the whole, I'm pleased with my life.	1	2	3	4	5	6	7	
21. I would describe myself as a good negotiator.	1	2	3	4	5	6	7	
22. I tend to get involved in things I later wish I could get out of.	1	2	3	4	5	6	7	
23. I often pause and think about my feelings.	1	2	3	4	5	6	7	
24. I believe I'm full of personal strengths.	1	2	3	4	5	6	7	
25. I tend to "back down" even if I know I'm right.	1	2	3	4	5	6	7	
26. I don't seem to have any power at all over other people's feelings.	1	2	3	4	5	6	7	
27. I generally believe that things will work out fine in my life.	1	2	3	4	5	6	7	

	1.....	2.....	3.....	4.....	5.....	6.....	7
	Completely Disagree				Completely Agree		
28. I find it difficult to bond well even with those close to me.	1	2	3	4	5	6	7
29. Generally, I'm able to adapt to new environments.	1	2	3	4	5	6	7
30. Others admire me for being relaxed.	1	2	3	4	5	6	7

If you want to be informed about the results of this research and take part in an interview, enter your email before submitting. Thank you!

Appendix 7: Topic guide for semi-structured interviews

Date and time of interview

Introduction

- Thank the participant for agreeing to be interviewed for the study.

“Thank you for agreeing to help with this research. I am a PhD student from General Practice and Primary Care. The aim of the research is to explore students’ psychological well-being and their views on emotional intelligence and humour. We are speaking to students who have participated in the survey last semester.”
- Recap participant information sheet, allow participants to ask questions.

“Everything that you say will be confidential. It’s possible that some quotes from this interview might be used in publications, but if that happens then they will be anonymous, that is they won’t identify you by name. Is there anything you want to ask me about at this point?”

“The style of the interview will be open ended so you may find some of the questions quite broad. There aren’t any right or wrong answers. I’m interested in what you think and feel. If at any time you want to stop the interview, or have a break, please feel free to let me know. I will be recording the interview, to capture exactly what has been said.”

“If no question, please sign the consent form, one for you and one for me.”

Interviewee background

- How are you finding studying at the university of Glasgow?
- How do you feel about the experience of living and studying in Glasgow (from a cultural point of view)?
- Could you tell me more about the social aspects of being a student here?
- What is the best/hardest thing about being a student?

Topics to be covered

Well-being

- What do you think we mean when we say mental well-being?

- What sort of things influence your mental well-being?
- Have you heard of emotional intelligence before, what does that mean to you?

Emotional intelligence

- Have you had the experience of encountering bad days that influenced your emotions?
- I'm interested to hear how you tend to react to negative emotions being directed at you from others?

Humour

- Could you tell me the most common way you use humour in daily life?
- Do you ever use humour to help you feel good about yourself or situations?
- Do you use different kinds of humour with different people?
- Language and culture generally play a big role in humour. Do you have any experience of using humour with friends have different cultural backgrounds?
- What's your favorite joke?

Conclusion

- Ask if there is anything else the participant would like to mention
“Are there aspects of what we have already talked about that you would like to say more about or things you would like to mention which haven't been covered?”
- Close the interview, thank the participant for their participation
“Thank you for your time.”

Appendix 8: Full search strategy for systematic review

Database: MEDLINE (Ovid)

Date: From 1946 to July Week 3 2022 (24/07/2022)

- 1 humo?r.tw.
- 2 emotional intelligence/
- 3 "wit and humor as topic"/
- 4 (emotional intelligence or emotional competence or emotional self-efficacy).tw.
- 5 (humo?r styles or humo?r styles questionnaire or HSQ).tw.
- 6 1 or 3 or 5
- 7 2 or 4
- 8 6 and 7

Database: PsychINFO (EBSCOhost)

Date: 24/07/2022

- S1 TI humor OR AB humor
- S2 DE "Humor" OR DE "Cartoons (Humor)" OR DE "Jokes" OR DE "Cartoons (Humor)"
- S3 DE "Emotional Intelligence"
- S4 TI ('emotional intelligence' or 'emotional competence or emotional self-efficacy) OR AB ('emotional intelligence' or 'emotional competence or emotional self-efficacy)
- S5 TI (humor styles or humor styles questionnaire or HSQ) OR AB (humor styles or humor styles questionnaire or HSQ)
- S6 S1 OR S2 OR S5
- S7 S3 OR S4
- S8 S6 AND S7

Database: Psychology and Behavioral Sciences Collection (EBSCOhost)

Date: 24/07/2022

- S1 TI humor OR AB humor
- S2 DE "Humor" OR DE "Cartoons (Humor)" OR DE "Jokes" OR DE "Cartoons (Humor)"
- S3 DE "Emotional Intelligence"
- S4 TI ('emotional intelligence' or 'emotional competence or emotional self-

efficacy) OR AB (emotional intelligence' or 'emotional competence or emotional self-efficacy)

S5 TI (humor styles or humor styles questionnaire or HSQ) OR AB (humor styles or humor styles questionnaire or HSQ)

S6 S1 OR S2 OR S5

S7 S3 OR S4

S8 S6 AND S7

Database: Web of science - all databases (Clarivate)

Date: 24/07/2022

1 TS=humor

2 TI=(humor styles OR humor styles OR humor styles questionnaire OR HSQ) OR AB=(humor styles OR humor styles OR humor styles questionnaire OR HSQ)

3 TS=emotional intelligence

4 TI=(emotional intelligence OR emotional competence OR emotional self-efficacy) OR AB=(emotional intelligence OR emotional competence OR emotional self-efficacy)

5 #2 OR #1

6 #4 OR #3

7 #6 AND #5

Database: PubMed

Date: 24/07/2022

1 Search: ((((((humor[Title/Abstract]) OR (humor styles[Title/Abstract])) OR (humor styles questionnaire[Title/Abstract])) OR (HSQ[Title/Abstract])) OR (wit[Title/Abstract])) OR (jokes[Title/Abstract])) OR (cartoons[Title/Abstract])

2 Search: (((emotional intelligence[MeSH Terms]) OR (emotional intelligence[Title/Abstract])) OR (emotional competence[Title/Abstract])) OR (emotional self-efficacy[Title/Abstract])

3 Search: #1 AND #2

Appendix 9: Data extraction form for systematic review

General information	Researcher performing data extraction:
	Date of data extraction:
	Author(s):
	Journal citation:
	Setting:
	Country:
Study characteristics	Aims of study:
	Study design:
	Inclusion criteria:
	Exclusion criteria:
	Recruitment procedures:
	Theoretical basis described:
	Pilot conducted:
	Ethics:
Participant characteristics	Age:
	Gender:
	Ethnicity:
	Pre-specification of subgroups:
	Disease or problem:
	Number of participants enrolled:
	Number of participants included in analysis:
	Number of withdrawals:
	Number of exclusions:
	Number lost to follow-up:
	Other:
Intervention	Who performed intervention:
	Description of intervention:
	Type of intervention:
Outcome data	Primary outcome:
	Secondary outcomes:
	Adverse events recorded:

	Statistical techniques used if any:
	Type of analysis:
Additional outcomes	Additional relevant outcomes:
	Adverse events:
Results	
Reported strengths and limitations	Strengths:
	Limitations:
Reporter conclusions	
Reviewer's comments	
Quality score	
Source of funding	

Appendix 10: Appraisal of Cross-sectional Studies Tool

	Question	Yes (2)	Don't know (1)	No (0)
Introduction				
1	Were the aims/objectives of the study clear?			
2	Was the theoretical basis adequately explained?			
Methods				
3	Was the study design appropriate for the stated aim(s)?			
4	Was the sample size justified?			
5	Was the target/reference population clearly defined? (Is it clear who the research was about?)			
6	Was the sample frame taken from an appropriate population base so that it closely represented the target/reference population under investigation?			
7	Was the selection process likely to select subjects/participants that were representative of the target/reference population under investigation?			
8	Were measures undertaken to address and categorise non-responders?			
9	Were the risk factor and outcome variables measured appropriate to the aims of the study?			
10	Were the risk factor and outcome variables measured correctly using instruments/measurements that had been trialled, piloted or published previously?			
11	Is it clear what was used to determine statistical significance and/or precision estimates? (e.g. p-values, confidence intervals)			
12	Were the methods (including statistical methods) sufficiently described to enable them to be repeated?			
Results				
13	Were the basic data adequately described?			
14*	Does the response rate raise concerns about non-response bias?			
15	If appropriate, was information about non-responders described?			
16	Were the results internally consistent?			
17	Were the results presented for all the analyses described in the methods?			
Discussion				
18	Were the authors' discussions and conclusions justified by the results?			
19	Could there be confounding factors that have been accounted for?			
20	Were the limitations of the study discussed?			
Other				
21	Were there any funding sources or conflicts of interest that may affect the authors' interpretation of the results?			
22	Was ethical approval or consent of participants attained?			

Appendix 11: Example of detailed data extraction form - OGURLU

General information	Researcher performing data extraction: Rong Xing
	Date of data extraction: 1-9-2020
	Author(s): Üzeyir Ogurlu
	Journal citation: International Online Journal of Educational Sciences, 2015, 7 (2), 15-25
	Setting: College students in Faculty of Education in Kocaeli University
	Country: Turkey
Study characteristics	Aims of study: To investigate the relationships between humour styles and emotional intelligence and cognitive intelligence among university students.
	Study design: Cross-sectional survey
	Inclusion criteria: Senior students studying in Faculty of Education in Kocaeli University
	Exclusion criteria: None given
	Recruitment procedures: Survey sent to students and completed on a voluntary basis by students. Think that completing study was used as implied consent.
	Theoretical basis described: Emotionally and socially positive outcomes of humour are closely related to emotional awareness and regulation of

	emotion, which are central components of emotional intelligence.
	Pilot conducted: Not given
	Ethics: Not given
Participant characteristics	Age: From 18 to 24
	Gender: 205 women and 114 men
	Ethnicity: Not given
	Pre-specification of subgroups: None (mentioned that educational level, social status, gender and age should be examined in future studies)
	Disease or problem: N/A
	Number of participants surveyed: Not given
	Number of participants included in analysis: 319
	Number of withdrawals: N/A
	Number of exclusions: N/A
	Number lost to follow-up: N/A
	Other: N/A
Intervention	Who performed intervention: N/A
	Description of intervention: N/A
	Type of intervention:

	N/A
Outcome data	Primary outcome: 1. To what extent are HSQ, EI, and cognitive intelligence interrelated among university students? 2. To what extent does EI and cognitive intelligence predict HSQ among university students?
	Secondary outcomes: N/A
	Adverse events recorded: N/A
	Statistical techniques used if any: Pearson's correlation and linear regression.
	Type of analysis: Descriptive
Additional outcomes	Additional relevant outcomes: N/A
	Adverse events: N/A
Results	Overall EI was positively correlated with cognitive intelligence and self-enhancing humour but not to aggressive humour and self-defeating humour
Reported strengths and limitations	Strengths: Not given
	Limitations: Convenience sampling from a single faculty might lead to reduced generalizability of the findings. Confounding factors such as education level, social status, gender, and age were not investigated in the current study. Data were collected using self-reported measure, which might lead to socially desirable answers.
Reporter conclusions	EI was positively correlated with adaptive humour styles but was not significantly correlated with maladaptive humour. Cognitive intelligence did not affect humour

	styles.
Reviewer's comments	Don't have a denominator i.e. how many students were sent the survey so don't know response rate and so responders may be biased
Quality score	28/44
Source of funding	Not given

Appendix 12: Appraisal of Cross-sectional Studies - Ogurlu (28/44)

	Question	Yes (2)	Don't know (1)	No (0)
Introduction				
1	Were the aims/objectives of the study clear?	2		
2	Was the theoretical basis adequately explained?	2		
Methods				
3	Was the study design appropriate for the stated aim(s)?	2		
4	Was the sample size justified?		1	
5	Was the target/reference population clearly defined? (Is it clear who the research was about?)	2		
6	Was the sample frame taken from an appropriate population base so that it closely represented the target/reference population under investigation?			0
7	Was the selection process likely to select subjects/participants that were representative of the target/reference population under investigation?		1	
8	Were measures undertaken to address and categorise non-responders?			0
9	Were the risk factor and outcome variables measured appropriate to the aims of the study?	2		
10	Were the risk factor and outcome variables measured correctly using instruments/measurements that had been trialled, piloted or published previously?	2		
11	Is it clear what was used to determine statistical significance and/or precision estimates? (e.g. p-values, confidence intervals)	2		
12	Were the methods (including statistical methods) sufficiently described to enable them to be repeated?	2		
Results				
13	Were the basic data adequately described?	2		
14*	Does the response rate raise concerns about non-response bias?	0		
15	If appropriate, was information about non-responders described?			0
16	Were the results internally consistent?	2		
17	Were the results presented for all the analyses described in the methods?		1	
Discussion				
18	Were the authors' discussions and conclusions justified by the results?	2		
19	Could there be confounding factors that have been accounted for?			0
20	Were the limitations of the study discussed?		1	
Other				
21	Were there any funding sources or conflicts of interest that may affect the authors' interpretation of the results?		1	
22	Was ethical approval or consent of participants attained?		1	

Appendix 13: Pilot study for the quantitative study

In the pilot study for the quantitative study, participants were a convenience sample of students meeting the eligibility criteria who were known to the researcher (RX). The researcher (RX) explained the aim of the study to the volunteer participants and obtained signed consent from them. Participants completed 7 questionnaires including the positive and negative affect schedule (PANAS), satisfaction with life scale (SWLS), PHQ-9, GAD-7, humour styles questionnaires (HSQ), trait emotional intelligence questionnaires - short form (TEIQue-SF), and scale of psychological well-being by Ryff (SPWB), in that order. Feedback involving questionnaires were required.

Six students from China, Indonesia and India participated in the pilot study. Participants usually spent 20 to 30 mins in total completing the questionnaires. Feedback from the pilot participants concerned typesetting, questionnaire length, and the meaning of some items. They were: (1) "Some questions from HSQ and TEIQue were difficult to understand." (2) "It was easy. Had Short sentences. Easy to understand but I didn't know meaning of 1 word 'jittery' so couldn't answer." (3) "Scale is consistently used. At last few questions I was getting confused 0.01% in choosing correct no. But a good and was keeping me excited what next? What next?" (4) "It might be a little bit long for people whose suffering from a mental issue and they probably might not feel comfortable filling out so many questions related to their mental state? But again, it depends on who your targeted

participants are.” (5) “The last questionnaire was difficult to understand. But it might be because I was tired.” (6) “I thought it was fine, but you might want to make the fonts and style of each of the sections the same. Another thing is, there are sections that has a results section at the end where we add up our scores according to our answers. Is that supposed to be done by the participants or is it for the researcher to score?”

In response, I reset the typesetting of the questionnaires and made explanatory notes for some questions that were reported as difficult to understand. I also recommended the website, “Helping Distressed Students: A Guide for University Staff”, at the end of the whole questionnaire as a resource for participants who may become distressed.

Appendix 14: Results of discriminant validity for the Model-SWB

Table 1 Discriminant validity (Fornell-Larcker Criterion) for the measurement model (Model-SWB).

Constructs	HSAF	HSAG	HSSD	HSSE	LS	NA	PA	TEI
HSAF	.893							
HSAG	.214	.798						
HSSD	.218	.334	.871					
HSSE	.521	.164	.159	.874				
LS	.188	-.052	-.288	.303	.875			
NA	-.155	.136	.282	-.149	-.393	.904		
PA	.170	.055	-.167	.342	.395	-.132	.906	
TEI	.394	-.127	-.331	.494	.649	-.427	.482	.782

Note: HSAF = affiliative humour; HSSE = self-enhancing humour; HSAG = aggressive humour; HSSD = self-defeating humour; PA = positive affect; NA = negative affect; LS = life satisfaction; TEI = trait emotional intelligence.

Table 2 Discriminant validity (Heterotrait-Monotrait Ratio (HTMT)) for the measurement model (Model-SWB).

Constructs	HSAF	HSAG	HSSD	HSSE	LS	NA	PA	TEI
HSAF								
HSAG	.292							
HSSD	.276	.399						
HSSE	.607	.203	.197					
LS	.216	.082	.321	.354				
NA	.171	.131	.308	.169	.447			
PA	.192	.074	.174	.389	.451	.145		
TEI	.475	.197	.370	.586	.757	.496	.559	

Note: HSAF = affiliative humour; HSSE = self-enhancing humour; HSAG = aggressive humour; HSSD = self-defeating humour; PA = positive affect; NA = negative affect; LS = life satisfaction; TEI = trait emotional intelligence.

Appendix 15: Results of model evaluation of the Model-PWB

Table 1 Indicators of the measurement model (Model-PWB). Results of indicator loadings, internal consistency reliability, and convergent validity.

Constructs	Items	Outer loading	α	rho_A	CR	AVE
Trait EI	Emotionality	.746	.787	.811	.862	.612
	Self-control	.749				
	Sociability	.746				
	Well-being	.880				
Affiliative humour	AF1	.899	.874	.878	.922	.799
	AF2	.885				
	AF3	.897				
Self-enhancing humour	SE1	.871	.847	.856	.907	.765
	SE2	.885				
	SE3	.867				
Aggressive humour	AG1	.731	.753	1.226	.841	.643
	AG2	.950				
	AG3	.702				
Self-defeating humour	SD1	.872	.846	.912	.905	.760

	SD2	.916				
	SD3	.825				
Psychological well-being	PWB1	.941	.894	.902	.934	.825
	PWB2	.913				
	PWB3	.870				

Note: AF = affiliative humour; SE = self-enhancing humour; AG = aggressive humour; SD = self-defeating humour; PWB = psychological well-being; CR = composite reliability; AVE = average variance extracted; α = Cronbach's Alpha.

Table 2 Discriminant validity (Fornell-Larcker Criterion) for Model-PWB.

Constructs	HSAF	HSAG	HSSD	HSSE	PWB	TEI
HSAF	.894					
HSAG	.192	.802				
HSSD	.224	.286	.872			
HSSE	.522	.129	.158	.874		
PWB	.383	-.135	-.363	.467	.908	
TEI	.399	-.133	-.324	.491	.886	.782

Note: HSAF = affiliative humour; HSSE = self-enhancing humour; HSAG = aggressive humour; HSSD = self-defeating humour; PA = positive affect; NA = negative affect; LS = life satisfaction; TEI = trait emotional intelligence.

Table 3 Discriminant validity (cross-loadings) for Model-PWB.

	HSAF	HSAG	HSSD	HSSE	PWB	TEI
AF1	.899	.155	.228	.497	.357	.359
AF2	.885	.177	.144	.424	.360	.378
AF3	.897	.184	.232	.481	.305	.329
AG1	.263	.731	.403	.237	-.053	-.065
AG2	.114	.950	.213	.067	-.158	-.154
AG3	.205	.702	.155	.098	-.056	-.043
PWB1	.348	-.148	-.357	.468	.941	.839
PWB2	.407	-.140	-.306	.463	.913	.843
PWB3	.281	-.075	-.328	.330	.870	.723
SD1	.201	.218	.872	.202	-.231	-.210
SD2	.129	.228	.916	.125	-.393	-.359
SD3	.288	.310	.825	.104	-.286	-.239
SE1	.426	.076	.144	.871	.365	.374
SE2	.439	.103	.106	.885	.452	.475
SE3	.503	.156	.168	.867	.398	.428
EM	.343	-.277	-.171	.278	.608	.746
SC	.131	-.091	-.339	.379	.637	.749
SO	.392	.044	-.148	.370	.640	.746
WB	.371	-.103	-.335	.483	.851	.880

Note: HSAF = affiliative humour (factor); HSSE = self-enhancing humour (factor); HSAG = aggressive humour (factor); HSSD = self-defeating humour (factor); AF = affiliative humour (item); SE = self-enhancing humour (item); AG = aggressive

humour (item); SD = self-defeating humour (item); PWB = psychological well-being; EM = emotionality; SC = self-control; SO = sociability; WB = well-being; TEI = trait emotional intelligence.

Table 4 Indicators of structured model (Model-PWB). Results of variance inflation factor, coefficient of determination, effect size, Q^2 value, and standardized root mean square residual.

Constructs	R^2	f^2	Q^2	VIF	SRMR
HSAF	.159	.014	.125	1.602	.078
HSAG	.018	.001	.007	1.140	
HSSD	.105	.061	.073	1.467	
HSSE	.241	.016	.179	1.710	
PWB	.799		.652		
TEI		1.575		1.912	

Note: HSAF = affiliative humour; HSSE = self-enhancing humour; HSAG = aggressive humour; HSSD = self-defeating humour; PA = positive affect; NA = negative affect; LS = life satisfaction; TEI = trait emotional intelligence; VIF = variance inflation factor; SRMR = standardized root mean square residual.

Appendix 16: Results of discriminant validity for the Model-MD

Table 1 Discriminant validity (Fornell-Larcker Criterion) for Model-MD.

Constructs	GAD	HSAF	HSAG	HSSD	HSSE	PHQ	TEI
GAD	.904						
HSAF	-.085	.894					
HSAG	.040	.202	.794				
HSSD	.298	.224	.322	.873			
HSSE	-.222	.521	.151	.158	.873		
PHQ	.723	-.105	.082	.426	-.238	.894	
TEI	-.549	.383	-.132	-.334	.497	-.609	.781

Note: HSAF = affiliative humour; HSSE = self-enhancing humour; HSAG = aggressive humour; HSSD = self-defeating humour; GAD = generalized anxiety disorder - 7; PHQ = patient health questionnaire - 9; TEI = trait emotional intelligence.

Table 2 Discriminant validity (Heterotrait-Monotrait Ratio (HTMT)) for Model-MD.

Constructs	GAD	HSAF	HSAG	HSSD	HSSE	PHQ	TEI
GAD							
HSAF	.097						
HSAG	.051	.292					
HSSD	.330	.276	.399				
HSSE	.240	.607	.203	.197			
PHQ	.819	.114	.091	.476	.260		
TEI	.623	.475	.197	.370	.586	.690	

Note: HSAF = affiliative humour; HSSE = self-enhancing humour; HSAG = aggressive humour; HSSD = self-defeating humour; GAD = generalized anxiety disorder - 7; PHQ = patient health questionnaire - 9; TEI = trait emotional intelligence.

Appendix 17: Coding details for the qualitative study

Hierarchical name
Nodes\Qual\Actions to problem solve
Nodes\Qual\Actions to problem solve\Decision dependents on situation & depth of friendship
Nodes\Qual\Actions to problem solve\Tend not to solve problem
Nodes\Qual\Actions to problem solve\Tend not to solve problem\Blame self
Nodes\Qual\Actions to problem solve\Tend not to solve problem\Cry & self-comfort
Nodes\Qual\Actions to problem solve\Tend not to solve problem\Not sure
Nodes\Qual\Actions to problem solve\Tend not to solve problem\Reflect and walk away
Nodes\Qual\Actions to problem solve\Tend to solve problem
Nodes\Qual\Actions to problem solve\Tend to solve problem\Be calm down
Nodes\Qual\Actions to problem solve\Tend to solve problem\Only ruminate
Nodes\Qual\Actions to problem solve\Tend to solve problem\Reflect and solve
Nodes\Qual\Actions to problem solve\Tend to solve problem\Simply apologize
Nodes\Qual\Communication
Nodes\Qual\Communication\Reflect and solve
Nodes\Qual\Communication\Simply apologize
Nodes\Qual\Cultural differences
Nodes\Qual\Cultural differences\Differences in behaviour examples
Nodes\Qual\Cultural differences\Differences in behaviour examples\Care about personal feelings or not
Nodes\Qual\Cultural differences\Differences in behaviour examples\Career pathways
Nodes\Qual\Cultural differences\Differences in behaviour examples\Drinking age
Nodes\Qual\Cultural differences\Differences in behaviour examples\Leisure activities
Nodes\Qual\Cultural differences\Differences in behaviour examples\Religious
Nodes\Qual\Cultural differences\Differences in behaviour examples\Scottish, English,

American humour

Nodes\\Qual\\Cultural differences\\Differences in behaviour examples\\Use humour

Nodes\\Qual\\Cultural differences\\Does not feel cultural differences

Nodes\\Qual\\Cultural differences\\Negative impact

Nodes\\Qual\\Cultural differences\\Negative impact\\Barriers in communication & relationship

Nodes\\Qual\\Cultural differences\\Negative impact\\Find difficult to adjust in the lifestyles

Nodes\\Qual\\Cultural differences\\Views on cultural differences

Nodes\\Qual\\Cultural differences\\Views on cultural differences\\Can learn from cultural differences

Nodes\\Qual\\Cultural differences\\Views on cultural differences\\Cultural differences are common

Nodes\\Qual\\Cultural differences\\Views on cultural differences\\Cultural differences can also be a kind of humour

Nodes\\Qual\\Cultural differences\\Views on cultural differences\\Have open attitudes to and get involved in cultural differences

Nodes\\Qual\\Cultural differences\\Views on cultural differences\\Uncomfortable

Nodes\\Qual\\Cultural differences\\Views on cultural differences\\Understand and show respect

Nodes\\Qual\\Digest alone

Nodes\\Qual\\Digest alone\\Blame self

Nodes\\Qual\\Digest alone\\Cry & self-comfort

Nodes\\Qual\\Digest alone\\Only ruminate

Nodes\\Qual\\Digest alone\\Reflect and walk away

Nodes\\Qual\\Digest alone\\Reflect and walk away\\Be calm down

Nodes\\Qual\\Factors affecting mental well-being

Nodes\\Qual\\Factors affecting mental well-being\\Big environment

Nodes\\Qual\\Factors affecting mental well-being\\Everything

Nodes\\Qual\\Factors affecting mental well-being\\Relating to interaction with others

Nodes\\Qual\\Factors affecting mental well-being\\Relating to interaction with others\\Connection with others matter

Nodes\\Qual\\Factors affecting mental well-being\\Relating to interaction with others\\Connection with others matter\\Friends & family

Nodes\\Qual\\Factors affecting mental well-being\\Relating to interaction with others\\Connection with others matter\\Relationship with colleague

Nodes\\Qual\\Factors affecting mental well-being\\Relating to interaction with others\\Connection with others matter\\Relationship with supervisor

Nodes\\Qual\\Factors affecting mental well-being\\Relating to interaction with others\\Connection with others matter\\Romance relationship

Nodes\\Qual\\Factors affecting mental well-being\\Relating to interaction with others\\Connection with others matter\\Share similar experience with others

Nodes\\Qual\\Factors affecting mental well-being\\Relating to interaction with others\\Others' emotion

Nodes\\Qual\\Factors affecting mental well-being\\Relating to interaction with others\\Peer pressure

Nodes\\Qual\\Factors affecting mental well-being\\Relating to self

Nodes\\Qual\\Factors affecting mental well-being\\Relating to self\\Academic pressure

Nodes\\Qual\\Factors affecting mental well-being\\Relating to self\\Financial situation

Nodes\\Qual\\Factors affecting mental well-being\\Relating to self\\Helplessness

Nodes\\Qual\\Factors affecting mental well-being\\Relating to self\\Impact of COVID-19

Nodes\\Qual\\Factors affecting mental well-being\\Relating to self\\Language-emotions

Nodes\\Qual\\Factors affecting mental well-being\\Relating to self\\Lifestyle

Nodes\\Qual\\Factors affecting mental well-being\\Relating to self\\Lifestyle\\Alcohol & drugs

Nodes\\Qual\\Factors affecting mental well-being\\Relating to self\\Lifestyle\\Diet

Nodes\\Qual\\Factors affecting mental well-being\\Relating to self\\Lifestyle\\Exercise

Nodes\\Qual\\Factors affecting mental well-being\\Relating to self\\Lifestyle\\Lifestyle000

Nodes\\Qual\\Factors affecting mental well-being\\Relating to self\\Lifestyle\\Sleep

Nodes\\Qual\\Factors affecting mental well-being\\Relating to self\\Lifestyle\\Work-life balance

& regularly

Nodes\Qual\Factors affecting mental well-being\Relating to self\Loneliness000

Nodes\Qual\Factors affecting mental well-being\Relating to self\Physical health

Nodes\Qual\Factors affecting mental well-being\Relating to self\Plans can be achieved or not

Nodes\Qual\Factors affecting mental well-being\Relating to self\Procrastination

Nodes\Qual\Factors affecting mental well-being\Relating to self\Resilience is important to doing a PhD

Nodes\Qual\Factors affecting mental well-being\Relating to self\Self-

Nodes\Qual\Factors affecting mental well-being\Relating to self\Self-\Future directions-uncertainty

Nodes\Qual\Factors affecting mental well-being\Relating to self\Self-\Mind-set, pessimistic or optimism

Nodes\Qual\Factors affecting mental well-being\Relating to self\Self-\Self-deficiency

Nodes\Qual\Factors affecting mental well-being\Relating to self\Self-\Self-development

Nodes\Qual\Factors affecting mental well-being\Relating to self\Self-\Self-motivated

Nodes\Qual\Factors affecting mental well-being\Relating to self\Self-\Sense of control

Nodes\Qual\Factors affecting mental well-being\Relating to self\Weather-emotions

Nodes\Qual\Humour

Nodes\Qual\Humour styles

Nodes\Qual\Humour styles\Adaptive humour

Nodes\Qual\Humour styles\Maladaptive humour

Nodes\Qual\Humour\Common way in daily life

Nodes\Qual\Humour\Common way in daily life\To others

Nodes\Qual\Humour\Common way in daily life\To others\Defuse situation

Nodes\Qual\Humour\Common way in daily life\To others\Puns

Nodes\Qual\Humour\Common way in daily life\To others\Sarcasm

Nodes\Qual\Humour\Common way in daily life\To others\Self-deprecating

Nodes\\Qual\\Humour\\Common way in daily life\\To others\\Share funny things with other

Nodes\\Qual\\Humour\\Common way in daily life\\To others\\Tell jokes

Nodes\\Qual\\Humour\\Common way in daily life\\To others\\Witty

Nodes\\Qual\\Humour\\Common way in daily life\\To self

Nodes\\Qual\\Humour\\Common way in daily life\\To self\\Be optimistic

Nodes\\Qual\\Humour\\Common way in daily life\\To self\\Watch talk shows, comedy

Nodes\\Qual\\Humour\\Cultural differences in using humour

Nodes\\Qual\\Humour\\Cultural differences in using humour\\Easy to use humour with people having similar cultural background and language

Nodes\\Qual\\Humour\\Difficulties in using humour in common way

Nodes\\Qual\\Humour\\Difficulties in using humour in common way\\Anonymity makes it easy to tell jokes

Nodes\\Qual\\Humour\\Difficulties in using humour in common way\\Feel difficult to create it

Nodes\\Qual\\Humour\\Difficulties in using humour in common way\\Feel difficult to create it\\Repeat others' joke

Nodes\\Qual\\Humour\\Difficulties in using humour in common way\\Not everyone can use humour appropriately

Nodes\\Qual\\Humour\\Difficulties in using humour in common way\\The current social environment is flat

Nodes\\Qual\\Humour\\Improve well-being(aim)

Nodes\\Qual\\Humour\\Improve well-being(aim)\\Adjust relations

Nodes\\Qual\\Humour\\Improve well-being(aim)\\Adjust relations\\Humour as social lubricant

Nodes\\Qual\\Humour\\Improve well-being(aim)\\Adjust relations\\Improve relationship

Nodes\\Qual\\Humour\\Improve well-being(aim)\\Self-adjustment

Nodes\\Qual\\Humour\\Improve well-being(aim)\\Self-adjustment\\Humorous perspective

Nodes\\Qual\\Humour\\Improve well-being(aim)\\Self-adjustment\\Humour can improve mental wellbeing

Nodes\\Qual\\Humour\\Improve well-being(aim)\\Self-adjustment\\Recover from bad situation

Nodes\\Qual\\Humour\\Improve well-being(aim)\\Self-adjustment\\Relieve stress & nervous

Nodes\\Qual\\Humour\\Improve well-being(aim)\\Won't use humour to improve low mood

Nodes\\Qual\\Humour\\Views on humour

Nodes\\Qual\\Humour\\Views on humour\\Person specific

Nodes\\Qual\\Humour\\Views on humour\\Person specific\\Depend on user's personality

Nodes\\Qual\\Humour\\Views on humour\\Person specific\\Depend on user's personality\\Humour is not a good choice for socially anxious person in stressful situation

Nodes\\Qual\\Humour\\Views on humour\\Person specific\\Depend on who you're speaking to

Nodes\\Qual\\Humour\\Views on humour\\Person specific\\Depend on who you're speaking to\\Feel difficult to use humour with elder

Nodes\\Qual\\Humour\\Views on humour\\Person specific\\Depend on who you're speaking to\\Prefer to use humour with familiar persons

Nodes\\Qual\\Humour\\Views on humour\\Person specific\\Feel difficult to resonate with others

Nodes\\Qual\\Humour\\Views on humour\\Situation specific

Nodes\\Qual\\Humour\\Views on humour\\Situation specific\\Humour is unintentional

Nodes\\Qual\\Humour\\Views on humour\\Wide-ranging

Nodes\\Qual\\Life & study in Glasgow

Nodes\\Qual\\Life & study in Glasgow\\Life

Nodes\\Qual\\Life & study in Glasgow\\Life\\Advantages-life

Nodes\\Qual\\Life & study in Glasgow\\Life\\Advantages-life\\Diverse social environment & community

Nodes\\Qual\\Life & study in Glasgow\\Life\\Advantages-life\\Enjoy part-time work for students

Nodes\\Qual\\Life & study in Glasgow\\Life\\Advantages-life\\Enjoy the city

Nodes\\Qual\\Life & study in Glasgow\\Life\\Advantages-life\\Get involved with church

Nodes\\Qual\\Life & study in Glasgow\\Life\\Advantages-life\\Good reputation

Nodes\\Qual\\Life & study in Glasgow\\Life\\Advantages-life\\Gym

Nodes\\Qual\\Life & study in Glasgow\\Life\\Advantages-life\\People are very friendly

Nodes\\Qual\\Life & study in Glasgow\\Life\\Advantages-life\\Public transport

Nodes\\Qual\\Life & study in Glasgow\\Life\\Advantages-life\\Sense of belonging

Nodes\\Qual\\Life & study in Glasgow\\Life\\Advantages-life\\Student discount

Nodes\\Qual\\Life & study in Glasgow\\Life\\Advantages-life\\Very open environment in Glasgow

Nodes\\Qual\\Life & study in Glasgow\\Life\\Difficulties-life

Nodes\\Qual\\Life & study in Glasgow\\Life\\Difficulties-life\\Accent

Nodes\\Qual\\Life & study in Glasgow\\Life\\Difficulties-life\\Circle of friends is small

Nodes\\Qual\\Life & study in Glasgow\\Life\\Difficulties-life\\Feel pressure about the slogan

Nodes\\Qual\\Life & study in Glasgow\\Life\\Difficulties-life\\Financial pressure - balance study and part-time work

Nodes\\Qual\\Life & study in Glasgow\\Life\\Difficulties-life\\Find difficult to blend in with local people

Nodes\\Qual\\Life & study in Glasgow\\Life\\Difficulties-life\\Unpleasant experience in pursuing support

Nodes\\Qual\\Life & study in Glasgow\\Life\\Difficulties-life\\Weather-hardest thing

Nodes\\Qual\\Life & study in Glasgow\\Study

Nodes\\Qual\\Life & study in Glasgow\\Study\\Advantages-study

Nodes\\Qual\\Life & study in Glasgow\\Study\\Advantages-study\\A lot of opportunities & supports in academic

Nodes\\Qual\\Life & study in Glasgow\\Study\\Advantages-study\\Enjoy course & programme

Nodes\\Qual\\Life & study in Glasgow\\Study\\Advantages-study\\Enjoy course & programme\\Similar research interests

Nodes\\Qual\\Life & study in Glasgow\\Study\\Advantages-study\\Good opportunity to the people with children to study here

Nodes\\Qual\\Life & study in Glasgow\\Study\\Advantages-study\\Great library

Nodes\\Qual\\Life & study in Glasgow\\Study\\Advantages-study\\Strong University environment

Nodes\\Qual\\Life & study in Glasgow\\Study\\Advantages-study\\Supportive staff & teachers

Nodes\\Qual\\Life & study in Glasgow\\Study\\Advantages-study\\Supportive supervisors

Nodes\\Qual\\Life & study in Glasgow\\Study\\Difficulties-study

Nodes\\Qual\\Life & study in Glasgow\\Study\\Difficulties-study\\Challenge in the first year

Nodes\\Qual\\Life & study in Glasgow\\Study\\Difficulties-study\\Language barriers in academic study

Nodes\\Qual\\Life & study in Glasgow\\Study\\Difficulties-study\\Less staffs in the library

Nodes\\Qual\\Life & study in Glasgow\\Study\\Difficulties-study\\Not very flexible(other words)

Nodes\\Qual\\Life & study in Glasgow\\Study\\Difficulties-study\\Socialising in first language reduces new language fluency in English

Nodes\\Qual\\Life & study in Glasgow\\Study\\Difficulties-study\\Study by self

Nodes\\Qual\\Understanding of EI

Nodes\\Qual\\Understanding of EI\\Comprehensive understanding

Nodes\\Qual\\Understanding of EI\\Comprehensive understanding\\Managing emotions

Nodes\\Qual\\Understanding of EI\\Comprehensive understanding\\Perceiving & understanding emotions

Nodes\\Qual\\Understanding of EI\\EI is treating things reasonably

Nodes\\Qual\\Understanding of EI\\Good communicate skills

Nodes\\Qual\\Understanding of EI\\Never heard before

Nodes\\Qual\\Understanding of mental well-being

Nodes\\Qual\\Understanding of mental well-being\\Comprehensive understanding

Nodes\\Qual\\Understanding of mental well-being\\Comprehensive understanding\\Content

Nodes\\Qual\\Understanding of mental well-being\\Comprehensive understanding\\Control your emotions

Nodes\\Qual\\Understanding of mental well-being\\Comprehensive understanding\\Cope with surrounding

Nodes\\Qual\\Understanding of mental well-being\\Comprehensive understanding\\Function well on everyday basis

Nodes\\Qual\\Understanding of mental well-being\\Comprehensive understanding\\Get balance

Nodes\\Qual\\Understanding of mental well-being\\Comprehensive understanding\\Happiness & resilience

Nodes\\Qual\\Understanding of mental well-being\\Comprehensive understanding\\Mutual

understanding, weakness can be accepted

Nodes\\Qual\\Understanding of mental well-being\\Comprehensive understanding\\Myself is less stress

Nodes\\Qual\\Understanding of mental well-being\\Comprehensive understanding\\Personality & self-acceptance

Nodes\\Qual\\Understanding of mental well-being\\Comprehensive understanding\\State of mind

Nodes\\Qual\\Understanding of mental well-being\\Not sure

Nodes\\Qual\\Understanding of mental well-being\\The absence of negative emotions

Nodes\\Qual\\Ways to improve mental health

Nodes\\Qual\\Ways to improve mental health\\External support

Nodes\\Qual\\Ways to improve mental health\\External support\\Connected with others

Nodes\\Qual\\Ways to improve mental health\\External support\\Connected with others\\Hang out with friends

Nodes\\Qual\\Ways to improve mental health\\External support\\Connected with others\\Talk to sb. having similar experiences

Nodes\\Qual\\Ways to improve mental health\\External support\\Connected with others\\Talk with friends

Nodes\\Qual\\Ways to improve mental health\\External support\\Connected with others\\Talk with parents

Nodes\\Qual\\Ways to improve mental health\\External support\\Connected with others\\Talk with supervisors

Nodes\\Qual\\Ways to improve mental health\\External support\\Counselling-professional support

Nodes\\Qual\\Ways to improve mental health\\Feel confident in coping with negative emotions or situations

Nodes\\Qual\\Ways to improve mental health\\Feel confident in coping with negative emotions or situations\\Can communicate with colleagues well

Nodes\\Qual\\Ways to improve mental health\\Feel confident in coping with negative emotions or situations\\Can get used to bad weather

Nodes\\Qual\\Ways to improve mental health\\Feel confident in coping with negative emotions or situations\\Can get used to be alone

Nodes\\Qual\\Ways to improve mental health\\Feel confident in coping with negative emotions or situations\\Easy to get used to different cultures

Nodes\\Qual\\Ways to improve mental health\\Feel confident in coping with negative emotions or situations\\I'm a positive person

Nodes\\Qual\\Ways to improve mental health\\Not sure

Nodes\\Qual\\Ways to improve mental health\\Self- adjustment

Nodes\\Qual\\Ways to improve mental health\\Self- adjustment\\Cry

Nodes\\Qual\\Ways to improve mental health\\Self- adjustment\\Indoor & outdoor relax

Nodes\\Qual\\Ways to improve mental health\\Self- adjustment\\Indoor & outdoor relax\\Move attention away from stressors

Nodes\\Qual\\Ways to improve mental health\\Self- adjustment\\Look good side of things

Nodes\\Qual\\Ways to improve mental health\\Self- adjustment\\Look good side of things\\Translate anxiety into motivation

Nodes\\Qual\\Ways to improve mental health\\Self- adjustment\\Meditate & ruminate

Nodes\\Qual\\Ways to improve mental health\\Self- adjustment\\Self-encourage and keep going

Nodes\\Qual\\Ways to improve mental health\\Self- adjustment\\Stay alone

Appendix 18: Thematic map for the qualitative study

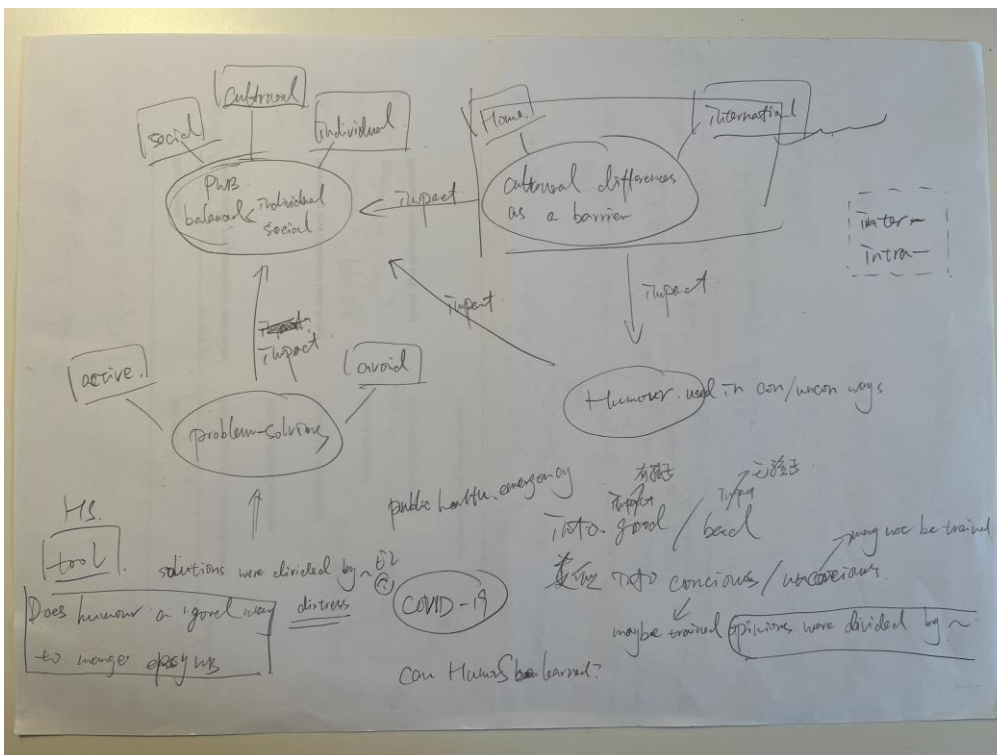


Figure 1. The initial mapping for the qualitative study

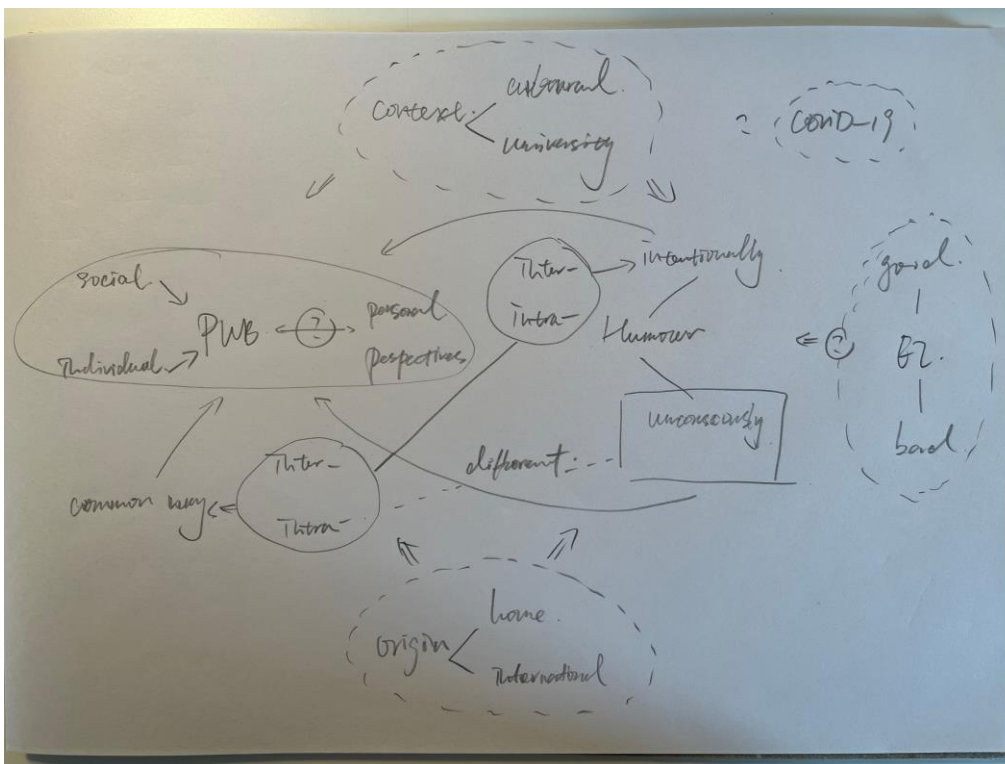


Figure 2. The refined thematic map for the qualitative study

Appendix 19: 15-point checklist for good reflexive thematic analysis

Table 1. The 15-point checklist for good reflexive thematic analysis (reproduced from Braun and Clarke, 2022)

No.	Process	Criteria
1	Transcription	The data have been transcribed to an appropriate level of detail; all transcripts have been checked against the original recordings for “accuracy”.
2	Coding and theme development	Each data item has been given thorough and repeated attention in the coding process.
3		The coding process has been thorough, inclusive and comprehensive; themes have not been developed from a few vivid examples (an anecdotal approach).
4		All relevant extracts for each theme have been collated.
5		Candidate themes have been checked against coded data and back to the original dataset.
6		Themes are internally coherent, consistent, and distinctive; each theme contains a well-defined central organising concept; any subthemes share the central organizing concept of the theme.
7		Analysis and interpretation - in the written report
8		Analysis and data match each other - the extracts evidence the analytic claims.
9		Analysis tells a convincing and well-organised story about the data and topic; analysis addresses the research question.
10		An appropriate balance between analytic narrative and

data extracts is n provided.

11	Overall	Enough time has been allocated to complete all phases of the analysis adequately, without rushing a phase, or giving it a once-over-lightly (including returning to earlier phases or redoing the analysis if need be).
12	Written report	The specific approach to thematic analysis, and the particulars of the approach, including theoretical positions and assumptions, are clearly explicated.
13		There is a good fit between what was claimed, and what was done - i.e. the described method and reported analysis are consistent.
14		The language and concepts used in the report are consistent with the ontological and epistemological positions of the analysis.
15		The researcher is positioned as active in the research process; themes do not just “emerge”.
