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Faculty of Environmental and Life Sciences

The Benefits of Children's Gratitude: Identifying Mediators and Designing a New Measure

by

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<u>Abstract</u>

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School-based gratitude interventions show evidence of enhancing student well-being but there is limited research suggesting how gratitude increases well-being. There is also the need for a suitable tool to measure children's gratitude and evaluate the impact of gratitude interventions. The researcher sought to address these literature gaps. A systematic literature review was used to address the question 'which variables mediate the association between young people's gratitude and well-being?'. Stronger evidence was found for cognitive and social resources as mediators, compared to mediators related to affect. A lack of experimental and longitudinal studies in the current evidence base was identified, highlighting avenues for future research.

In an empirical study, the researcher designed and screened a new questionnaire of children's gratitude, the Questionnaire of Appreciation in Youth (QUAY). Items were developed using the literature to identify a comprehensive definition of gratitude and its key features, and through discussion with the research supervisors who have extensive experience of studying gratitude. The initial items were screened in a focus group with three children aged eight to nine. Exploratory factor analysis was then conducted with responses from 107 children aged eight to 10. This led to the development of an 11-item scale with good reliability and convergent validity with an existing measure of gratitude, the GQ-6. A three-factor structure was retained, with subscales addressing gratitude, appreciation, and sense of privilege. Limitations include the lack of a more diverse sample, the absence of reverse-scored items, positive skew in responses, and the need to establish discriminant validity. Implications include new insights into the structure of children's gratitude, providing a working tool which could be further developed in order to measure children's gratitude more effectively.

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Research Thesis: Declaration of Authorship

Print name: Sophie Olivia Smith

Title of thesis: The Benefits of Children's Gratitude: Identifying Mediators and Designing a New Measure

I declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;

Signature: Date: 03.10.2021

Acknowledgements

Definitions and Abbreviations

χ^2 .... Chi Squared statistic

|R| .... Determinant

a (path) .... Path from predictor to mediator variable

ab .... Indirect effect

AI .... Appreciation Inventory

AIC .... Akaike Information Criterion

b (path) .... Path from mediator to outcome variable

b .... Beta (unstandardised coefficient)

B&B .... Broaden and Build theory

BCa .... Bias Corrected and Accelerated bootstrap

BCI .... Bootstrap Standard Confidence Interval

BPN .... Basic Psychological Needs theory

c .... Total effect

c' .... Direct effect

CFI .... Comparative Fit Index

CI .... Confidence Interval

CoR .... Conservation of Resources theory

Covid-19 .... Coronavirus Disease 2019

CS .... Cross-Sectional

Ctrl .... Control

df .... Degrees of Freedom

DNR .... Did Not Report

EBSCO .... Elton B. Stephens Company

EFA .... Exploratory Factor Analysis

EP .... Educational Psychologist

ERGO .... Ethics and Research Governance Online

Definitions and Abbreviations

ERIC ....Education Research Information Centre

EXP ....Experimental

F ....F-Test statistic

F = ...Females

GAC ....Gratitude Adjective Checklist

GFI.......................................Goodness-of-Fit Index

GQ-5...................................Gratitude Questionnaire Five Item Version

GQ-6...................................Gratitude Questionnaire Six Item Form

GRAT ....Gratitude, Resentment and Appreciation Test

IFI ....Incremental Fit Index

IUG ....Inventory of Undergraduates' Gratitude

KMO ....Kaiser-Meyer-Olkin test

LS ....Life Satisfaction

LT ....Longitudinal

M = ...Males

M...Mean

MANOVA ....Multiple Analysis of Variance

MAT ....Moral Affect Theory

max. ....Maximum

MF.......................................Model Fit

min.......................................Minimum

N ....Number (of cases)

NNFI ....Non-Normed Fit Index

OBS ....Observational

p...Probability (statistical significance)

PAF......................................Principal Axis Factoring

PRISMA................................Preferred Reporting Items for Systematic Reviews

QUAY...................................Questionnaire of Appreciation in Youth

r .... Pearson's correlation

R² .... R-Squared statistic

REG .... Regression

RMSEA .... Root-Mean-Square Error of Approximation

SB-χ² .... Satorra-Bentler Chi Square statistic

SD .... Standard Deviation

SDT .... Self-Determination Theory

SE .... Standard Error

SEM .... Structural Equation Modelling

SPRT .... Social and Psychological Resources theory

SRMR .... Standardised Root-Mean-Square Residual

t .... T-test statistic

T1 .... Time 1 (pre-test)

T2 .... Time 2

T3 .... Time 3

T4 .... Time 4

T5 .... Time 5 (post-test)

T6 .... Time 6 (follow up)

TLI .... Tucker-Lewis Index

US .... United States

USA .... United States of America

WEIRD .... Western, Educated, Industrialised, Rich and Democratic

z .... Z statistic (for Sobel test)

α .... Cronbach's alpha coefficient

β .... Beta (standardised coefficient)

ηp² .... Partial-Eta Squared statistic

Chapter 1 Introduction

1.1 Overview

This thesis is comprised of two papers, which each address relatively under-explored areas of the research into children's gratitude and its relation to well-being. The papers have been written with the aim of submitting for possible publication in peer reviewed journals. The systematic literature review in Chapter 2 is written with a view to approaching the Journal of Happiness Studies (Springer) and the empirical paper in Chapter 3 is written with the Journal of Positive Psychology (Routledge) in mind. See Appendix A for details of these journals. It is acknowledged that where the papers here exceed the word counts specified by the journals, this is to ensure that necessary detail is included which is required for the contribution of this work to the thesis. Therefore, following amendments made post-viva, these word counts will need to be reduced. This rest of this introduction will outline the context and rationale for the work, including how the two papers link together. It will go on to describe some of the ethical and methodological issues relevant to the research.

1.2 Positive Psychology

The field of positive psychology was developed with the goal of actively promoting well-being and flourishing, moving away from the traditional deficit model which focuses only on treating 'ill-being' (Seligman, 2019). Positive psychology involves the study of positive subjective experience as well as the qualities and virtues possessed by individuals and groups (Seligman & Csikszentmihalyi, 2000). Accordingly, positive psychology interventions are those designed to increase positive thoughts, feelings and behaviours (Sin & Lyubomirsky, 2009). Through positive education, schools are considered well-placed to support young people's social and emotional well-being, by teaching the skills, values and activities believed to foster well-being and other positive outcomes (Chodkiewicz & Boyle, 2017; Seligman et al., 2009).

1.3 Gratitude Interventions

Gratitude is one of 24 virtues which have been identified in positive psychology as the most frequently recognised and valued traits across many different cultures (Peterson & Seligman, 2004). In their original classification, Peterson and Seligman define gratitude as "a sense of thankfulness and joy in response to receiving a gift, whether the gift be a tangible benefit from a specific other or a moment of peaceful bliss evoked by natural beauty" (2004, p. 554). To date,

several interventions have been developed with the aim of promoting gratitude, including those which require participants to keep a daily or weekly gratitude journal to record things they are grateful for, write letters expressing gratitude to another person, and draw pictures or create mental images of things they are grateful for (Cregg & Cheavens, 2020; Dickens, 2017). More recently, technology has been employed so that participants can record their gratitude virtually via mobile applications, a development particularly aimed at adolescents (Bono et al., 2020).

There is an emerging body of research supporting the effectiveness of gratitude interventions for promoting the well-being of children and young people. For example, Froh et al. (2008) found that young adolescents who recorded five things they were grateful for each day for two weeks reported greater gratitude, optimism, and school satisfaction, and reduced negative affect, relative to a control group who recorded their daily hassles. However, the experimental effects of such interventions do seem to depend on the type of control group they are compared with. Recent meta-analyses have indicated that while they are typically found to be more successful than inactive control groups or alternative activity conditions (such as recording hassles), gratitude interventions are not often more effective when compared with psychologically active control groups performing other positive activities, such as completing acts of kindness or using signature strengths (Davis et al., 2016). The outcome variables measured also appear to make a difference. For example, Dickens (2017) found that gratitude interventions were more effective than other positive activities at increasing well-being, but not a range of other outcomes including happiness, life satisfaction, grateful mood, positive affect and self-esteem.

There is also evidence for the moderating effect of different variables on the relationship between gratitude interventions and positive outcomes. For example, Rash et al. (2011) found that trait gratitude moderated the effect of a gratitude intervention on adults' increased life satisfaction, whereby those initially lower in trait gratitude benefited more from the intervention. Diebel et al. (2016) found that gender moderated the impact of a gratitude diary intervention on children's levels of gratitude, with the intervention showing a greater effect for boys. Additionally, Froh, Kashdan, et al. (2009) found that young people who completed a gratitude intervention and were initially lower in positive affect showed greater increases in gratitude and positive affect than those who started the intervention feeling more positive. Although positive psychology interventions such as gratitude have typically been promoted as a universal approach to increasing positive outcomes, these results suggest that there may be greater benefits for those with lower well-being. This raises a question as to whether positive psychology interventions are best suited to universal or targeted delivery (Etherington & Costello, 2019).

1.4 Mechanisms

While several moderators have been explored, mediating variables of the relationship between gratitude and well-being have been highlighted as a topic meriting further analysis (Alkozei et al., 2018; Dickens, 2017; Wood et al., 2010). If we can understand the mechanisms by which gratitude can lead to well-being, we may be able to understand what makes its effects similar or different to other positive experiences, and design interventions which more closely target the 'active ingredients' of gratitude. A multitude of hypotheses have been proposed regarding the mechanisms by which gratitude may enhance positive outcomes, including that it may boost positive affect, help individuals to build resources which facilitate coping, increase positive attentional, interpretation and memory biases, and/or foster greater prosocial behaviour and social support (Algoe, 2012; Alkozei et al., 2018; Emmons & Mishra, 2011; McCullough et al., 2001; Watkins, 2014; Wood et al., 2010). As noted by several authors, our understanding of children's gratitude is particularly limited (Froh et al., 2007; Hussong et al., 2019; Nguyen & Gordon, 2020). If we are to harness the promising benefits of gratitude for young people's well-being, we need greater specificity in our understanding of how and why it appears to be effective.

1.5 Measuring Gratitude

One of the barriers to this understanding is that there is not currently a suitable measure of children's gratitude for use in this research. A valid measure is needed so that the impact of intervention on children's gratitude can be assessed. Furthermore, if interventions are more effective for children initially lower in gratitude, it would be useful to have a method for identifying these children. It would also be helpful for exploring children's trait gratitude in relation to positive outcomes and potential mediating variables. There are a range of questionnaire measures in use at present, including the Gratitude Questionnaire Six-Item Form (GQ-6; McCullough et al., 2002), the Appreciation Inventory (AI; Adler & Fagley, 2005), the Inventory of Undergraduates' Gratitude (IUG; Lin & Yeh, 2011), the Gratitude, Appreciation, and Resentment Test (GRAT; Watkins et al., 2003) and the Gratitude Adjective Checklist (GAC; McCullough et al., 2002). Although these measures have been validated for use with young people, they have some limitations. These include ceiling effects (Gabana et al., 2020; Moieni et al., 2018; Schache et al., 2020), language which is confusing for children (Froh, Fan, et al., 2011), and a failure to encompass all aspects of gratitude recognised in the literature (Hussong et al., 2019). Therefore, there is scope for a new measure which is more accessible, sensitive, and comprehensive.

1.6   Aims and Rationale

The suggestion that gratitude interventions may be more effective for those initially lower in gratitude needs some unpicking: it is possible that this arises as a result of current measures lacking sensitivity in detecting changes in gratitude for those with initially higher levels. A measure with a broader scope may allow us to identify whether gratitude interventions have the potential to extend the sophistication of children's gratitude beyond that which is captured by measures like the GQ-6. Furthermore, a multi-factorial measure could enable us to identify whether different aspects of gratitude are associated with different mechanisms explaining its relationship to well-being. Therefore, the issue of measurement and the issue of mechanisms go hand in hand when seeking to increase the specificity of our understanding of children's gratitude.

Consequently, in this thesis, the goal was to shed light on both interrelated questions. A systematic review was conducted with the aim of identifying variables that have been found to mediate the relationship between children's gratitude and their well-being in the extant literature. The empirical paper details the design and validation of a new self-report questionnaire measure of children's gratitude, which is intended to be more sensitive and comprehensive than existing questionnaire measures, as well as more accessible for children. It is hoped that together, these elements will contribute to a more nuanced and detailed understanding of children's gratitude, which will inform the design and evaluation of gratitude interventions in the future.

1.7   Cultural Sensitivity

There are some notable features of the methodology which are important to emphasise here, the first of which is the intention to maintain a reflective approach to the impact of context and culture on this research. As Merçon-Vargas et al. (2018) acknowledge, much of the gratitude research to date has been conducted using participants from "Western, Educated, Industrialised, Rich and Democratic (WEIRD) societies" (p.7), and we cannot assume that these findings can be generalised to individuals in other societies, who may have different values and cultural norms. Therefore, research conducted in any country was included for consideration in the systematic review, so that potential culturally specific effects could be identified and acknowledged. This has important implications for the application of this work to the design of interventions, since there is evidence that culture has an impact on the emotions participants experience in relation to gratitude interventions (Layous et al., 2013). Furthermore, cultural awareness is imperative in the design of questionnaire measures. As highlighted by Song et al. (2015), content, language and samples used to pilot and validate measures all matter when developing questionnaire measures of psychological constructs. Therefore, in the empirical paper, the aim was to be transparent and

reflective about potential cultural bias in the measure, acknowledging the limitations in terms of its generalisability to contexts beyond the pilot sample.

1.8   Consequential Validity

It is also important to be clear from the outset about the intended use of the questionnaire measure. Conceptualising and measuring gratitude as a positive quality implies the presence of an inverse, negatively valanced state of 'ingratitude' (Hussong et al., 2019). As Curren and Kotzee (2014) warn, we should exercise caution when seeking to measure constructs which could be considered 'virtues' in our students. They highlight that the aim of such measurement should be primarily to evaluate education programs, and not to make judgements about the 'virtuousness' of individual students. Additionally, there are power dynamics involved in encouraging individuals to express gratitude. For instance, there is some evidence suggesting that expressing gratitude to individuals from higher status groups can discourage members of lower-power groups from advocating for themselves (Ksenofontov & Becker, 2020). Therefore, the social implications of the questionnaire need to be considered. Providing a clear statement about the intended purpose and interpretation of the final measure was one step taken with the goal of increasing consequential validity.

1.9   Methodological Considerations

There are two aspects of the method which were intended to facilitate an ethical approach. One is the definition of gratitude that was used. Since Peterson and Seligman (2004) defined gratitude in their handbook of character strengths, there has been much inconsistency in the literature about whether the psychological construct of gratitude should refer only to expressing thanks to a benefactor, or a wider appreciation of any positive aspect of life (Rusk et al., 2015). By utilising the latter, broader definition of gratitude, the aim was to reduce the focus on gratitude as a virtue or moral obligation, instead conceptualising it as a psychological tool, with which individuals can exercise autonomy and intrinsic motivation in how they use and express it. Secondly, a robust process was used to design the questionnaire, following the steps recommended by Carpenter (2018) and Clark and Watson (2019) for creating objective psychological measures with sufficient construct validity. Consequently, the process of creating the questionnaire involved drawing upon a qualitative synthesis of relevant existing measures of gratitude, as well as theoretical definitions of gratitude (Rusk et al., 2015). The measure was also piloted with children to assess the accessibility and meaning they made of the language used in

each item. This contributed to an iterative process whereby the measure was refined in response to feedback, as well as in the exploratory factor analysis (EFA) that followed.

1.10   Ontology and Epistemology

This body of work was underpinned by a critical realist framework. Critical realism assumes that three domains of reality exist: the *empirical*, the *actual* and the *real* (McEvoy et al., 2006). McEvoy et al. explain how the *empirical* domain comprises what can be experienced or observed, the *actual* domain refers to what actually exists whether it is observable or not, and the *real* domain constitutes the mechanisms which can generate actual phenomena. A critical realist account asserts that whilst we may not be able to directly access the full extent of reality, we can generate theories about the causal mechanisms that may be driving it, and gain some level of empirical feedback on these from what we observe in the world (Sayer, 2004). These theories can vary in the extent to which they capture the truth, and this can be influenced by the suitability of the research methods we use, as well as our existing beliefs and theories about those phenomena (Fletcher, 2017).

Consistent with the tenets of critical realism, this thesis was based on the assumption that gratitude and psychological well-being are phenomena that exist and can be measured with varying accuracy and as influenced by the interpretations of the researcher. Across the two papers, the aim of the body of work was to understand in more depth the causal mechanisms underpinning the association between gratitude and well-being (through the systematic literature review) and to identify a possible theoretical structure concerning the factors that explain individual differences in children's experience of gratitude (via EFA in the empirical paper). The use of a qualitative element (a focus group) to explore children's interpretations of the language used in the questionnaire items is an example of how critical realism shaped the methodology. This is because it was informed by a belief that the language used in the measure could influence the ability of the questionnaire items and therefore the resulting theory to accurately access and describe the structure of children's gratitude.

Consistent with this mixed-methods approach, a strength of critical realism is that it allows flexibility in the methodological approach used and the reasoning associated with this. As Eastwood et al. (2014) highlight, theory building involves deductive, abductive, retroductive and inductive reasoning. Critical realism supports this because it provides a framework where quantitative and qualitative methods are both seen as useful for generating and testing theories. As Reio and Shuck (2015) recognise, although the function of EFA is to test hypotheses quantitatively, there are some more subjective and inductive elements of the methodology. For

instance, EFA can be used to generate possible factor structures when there are no pre-existing hypotheses about what those structures might be, highlighting the role of inductive reasoning. Additionally, EFA can lack well-defined statistical criteria for evaluating the solutions it generates. Therefore, decisions made by the researcher such as how many factors to extract are subjective and are likely to be influenced by their existing knowledge and theories about the structure of gratitude. As a trainee educational psychologist (EP), the researcher believed this approach fits well with the role of the EP, which also involves adopting qualitative and quantitative and constructionist and reductionist stances in different aspects of the role (Sedgwick, 2019).

This thesis was also informed by the work on theories of knowledge for literature reviews by Schryen et al. (2015), who highlight that ontology can be an overlooked aspect of literature reviews. They offer a framework where reviews can be described as generating different types of knowledge and having different functions depending on how they represent and transform these types of knowledge. They assert that knowledge can be *tacit* (personal and unpublished) or *explicit* (available to others) and can exist as *domain knowledge* (content knowledge relevant to a particular field) or *domain metaknowledge* (arising from critical appraisal of domain knowledge). Considering the functions outlined by Schryen et al. (*synthesis*, *adoption of a new perspective*, *theory building*, *theory testing*, *identification of research gaps* and *provision of a research agenda*), the function of the literature review here is primarily to synthesise explicit domain knowledge, using a process of *combination.* This led to the identification of research gaps, thereby explicating the researcher's tacit domain metaknowledge regarding the area of gratitude research via a process of *externalisation*.

1.11   Covid-19

A final point of note is that this research took place in the context of the global Covid-19 pandemic. While the systematic literature review drew upon research conducted prior to this crisis, the validation of the questionnaire included children who were living with national restrictions in place. There were some challenges associated with this. First, it was more difficult to recruit participants because schools were under a good deal of pressure and were not accepting non-essential visitors. Second, local authority and university guidelines on conducting person-facing research were changing frequently. Third, the impact of the pandemic on children's psychological well-being was unfolding in real time and naturally there was a lag in how quickly research into those impacts was being conducted and published. Therefore, it was not easy to evaluate the extent to which children's responses to the questionnaire may have been influenced by the context they were living in and the associated psychological consequences. Another significant result of the pandemic was that many families encountered adverse financial

circumstances. This is likely to have influenced both their ability to access the technology required to engage with online research and their capacity to commit the time and cognitive resources required to take part (Lourenco & Tasimi, 2020). As Lourenco and Tasimi acknowledge, these factors will impact the diversity of research samples and therefore the ability to generalise from data collected during the pandemic.

However, the context did provide an interesting backdrop for research into gratitude specifically. At a time when many individuals and communities were experiencing novel and wide-ranging challenges, emotional well-being became a more prominent topic of discussion. Gratitude interventions are time and cost effective, are oriented towards noticing small, good things, and show some promising benefits for well-being. Therefore, research designed to inform their design and evaluation may be well-placed as we move through this global health crisis. This is not without a cautionary message about the potential misplacement of good intentions in asking people living in a difficult context to 'notice the good things' when they are dealing with significant challenges. These ethical considerations are likely to form important next steps for the gratitude literature as a whole.

Chapter 2   Systematic Literature Review

2.1   Title

Which Variables Mediate the Association Between Gratitude and Well-being Outcomes in Children and Young People?

2.2   Abstract

Young people higher in trait gratitude report greater well-being. Gratitude interventions also show promise for promoting children's well-being. Currently, the mechanisms by which gratitude influences well-being are poorly understood. The literature proposes multiple theoretical mechanisms, including increased positive affect, and development of social or cognitive resources. It is helpful to understand how gratitude enhances well-being, so that effective interventions can be designed which target these mechanisms. Therefore, there is a need to identify the variables which explain the gratitude- well-being association in children. In August 2020, a systematic search was conducted using three electronic databases: PsychINFO, ERIC and Web of Science. The search used the key words: gratitude, grateful* or thankful* and mediat* or mechanism*. A total of 915 papers were identified. Eighteen met the criteria for inclusion in the review. There was stronger support for mediators relating to resource building, compared with positive affect. There was evidence for the explanatory power of social and cognitive resources, as well as interpersonal and intrapersonal gratitude. There was a lack of longitudinal and experimental studies. However, the findings from the observational, cross-sectional studies were consistent with previous research. The findings suggest that gratitude interventions could usefully be designed to target both social and cognitive resources, and to elicit both interpersonal and intrapersonal gratitude. They highlight the need for future gratitude intervention studies to explore mediating variables.

Key words: gratitude, well-being, children, young people, mechanisms, interventions

2.3   Introduction

The emotional well-being of young people continues to be of relevance to researchers because there is increasing demand for mental health services in the UK (Pitchforth et al., 2019). Teachers in schools have been identified as key players in promoting young people's social and emotional well-being (Dewhirst et al., 2014). They are considered well placed to deliver well-being

interventions, particularly at a group level (Shoshani & Steinmetz, 2014). Positive psychology interventions, which involve promoting individuals' character strengths, skills and virtues as vehicles for enhancing their well-being, have shown promising results in schools when delivered effectively (Binfet, 2015; Durlak & Weissberg, 2011; Peterson & Seligman, 2004; Seligman et al., 2009; Taylor et al., 2017).

One of these virtues, which has gained increasing research attention for its links to well-being, is gratitude (Gulliford et al., 2013; Wood et al., 2010). Gratitude represents a positive experience of thankfulness which can be felt towards another person for something they have done, or as a more general appreciation towards positive aspects of life such as beauty in nature (Emmons et al., 2019; McCullough et al., 2001; Merçon-Vargas et al., 2018; Peterson & Seligman, 2004; Sansone, Randy & Sansone, Lori, 2010; Wood, Maltby, et al., 2008; Wood et al., 2010). Self-reported gratitude in these two areas is highly-correlated, suggesting that together they may represent a single, higher order personality trait (Wood, Maltby, et al., 2008). Consistent with Rosenberg's (1998) framework for organising affective processes, gratitude can be viewed as a state as well as a trait. Trait gratitude is viewed as a predisposition to grateful responding which is stable over time, whereas state gratitude is thought to consist of shorter term experiences such as moods and emotions (Emmons et al., 2019). Parents' descriptions of their children's gratitude suggest that young people's appreciation can also be experienced as a trait, emotion and mood, and can be felt towards another person or as simple appreciation for something in life (Halberstadt et al., 2016). To date, gratitude has typically been measured by self-report questionnaires. One of the most frequently cited measures is the Gratitude Questionnaire Six Item Form (GQ-6; McCullough et al., 2002). The GQ-6 treats gratitude as unifactorial, and focuses on the frequency, scope and content of individuals' grateful affect (Wood et al., 2010). Although originally developed for adults, it has been found to show a very similar factor structure in children aged 10 to 19 years in the US (Froh, Fan, et al., 2011).

Correlational data suggests that trait gratitude is positively associated with well-being. For instance, Watkins et al. (2003) found that students' and adults' scores on a measure of trait gratitude were positively associated with measures of positive affect and life satisfaction, and negatively associated with depression. Similarly, Wood, Joseph, et al. (2008) found that gratitude measured by the GQ-6 could explain 20 percent of the individual differences in adults' satisfaction with life, and an additional nine percent of variance in life satisfaction when controlling for the Big Five personality traits. These findings appear to arise in individuals in different countries. For example, for adults in both Japan and the United States, gratitude was found to have significant positive correlations with satisfaction with life, relationships, work and health, and to uniquely predict life and relationship satisfaction when controlling for demographics, neuroticism,

extraversion, and the other measures of satisfaction (Robustelli & Whisman, 2018). Furthermore, Taiwanese undergraduate students' gratitude uniquely contributed to measures of their life satisfaction and positive affect, over and above demographic variables and the Big Five personality traits (Lin, 2014). These relationships have also been found in adolescent samples (e.g. Froh, Yurkewicz, et al., 2009) and in children (e.g. Tian et al., 2015). Some initial evidence suggests that domain specific gratitude towards living beings (e.g. friends, family, teachers and pets) is associated with self-reported well-being in children as young as five years old (Nguyen & Gordon, 2020).

In addition to correlational studies on trait gratitude, several researchers have attempted to induce gratitude through intervention, and to assess the impact on well-being. These interventions have typically involved asking participants to keep a diary of things they are grateful for, or to count their blessings each day (Dickens, 2017). For example, Froh et al. (2008) asked early adolescents to record five things they were grateful for, every day for two weeks. Compared with young people who recorded daily hassles and those in an inactive control group, the gratitude intervention group reported greater gratitude, optimism, and life satisfaction, and decreased negative affect. There was also an association with school life satisfaction, which persisted to a follow-up three months later. Kerr et al. (2015) found that, in a clinical sample of outpatients awaiting follow-up treatment, keeping a daily gratitude diary for a fortnight cultivated gratitude, increased daily life satisfaction, sense of connectedness and optimism, and reduced anxiety. Several reviews and meta-analyses have highlighted the promising potential of gratitude interventions for increasing well-being (e.g. Cregg & Cheavens, 2020; Davis et al., 2016; Dickens, 2017; Renshaw & Olinger Steeves, 2016; Wood et al., 2010). Therefore, promoting gratitude may be of value to schools in supporting the emotional and mental health of young people.

When designing interventions, it is helpful to understand the mechanisms by which they may enhance positive outcomes (Van Stralen et al., 2011). As Lee et al. (2015) recognise, exploring mediators between an intervention and its outcomes can help us to understand why it is or is not effective. Furthermore, analysing potential mediators between a trait and a positive outcome can give rise to potential new target variables for intervention, as well as provide evidence for or against existing theoretical frameworks (Lee et al., 2015). Both types of research are useful in the context of gratitude interventions. If we can identify their more and less effective components, and identify new areas to target through them, we may be able to increase the efficacy of gratitude practices for enhancing children's well-being (Van Stralen et al., 2011).

At present, there is a relatively limited evidence base to suggest how trait or intervention-elicited gratitude may contribute to well-being (Davis et al., 2016; Emmons & Mishra, 2011). As

acknowledged by Wood et al. (2010), the mechanisms by which trait and intervention-elicited gratitude operate may be different, and it is not a given that gratitude interventions promote well-being through increased gratitude. There may be other mechanisms at play, and it is only through establishing statistical mediation that these can be reliably identified (Wood et al., 2010). As noted by Nguyen and Gordon (2020), our understanding of gratitude is especially limited when it comes to children and young people. There may be differences in the way gratitude operates for them, compared with adults. Children's understanding of and propensity for gratitude is thought to develop throughout childhood (de Lucca Freitas et al., 2011; Layous & Lyubomirsky, 2014), which is one factor that may affect their levels of trait gratitude and their engagement with gratitude interventions at different points in time. Furthermore, children live and learn in different contexts to adults, and there may be some benefits of gratitude that are particularly relevant to them. For example, a gratitude diary intervention for seven to 11 year olds was found to increase their sense of school belonging (Diebel et al., 2016), a variable associated with well-being (Baumeister & Leary, 1995; Jose et al., 2012). Therefore, further exploration of these mechanisms is required if we are to design more effective interventions to promote positive outcomes in schools.

The extant literature provides numerous theoretical perspectives to suggest why gratitude may enhance well-being. For instance, Emmons and Mishra (2011) present ten different hypotheses to explain the gratitude-well-being relationship, each of them with some degree of empirical support. These include the fact that gratitude may help to: facilitate coping with stress, reduce negative emotions associated with social comparison, reduce materialism, improve self-esteem, enhance access to positive memories, build social resources, motivate moral behaviour, encourage spiritual mindedness, facilitate goal attainment, and promote physical health. Similarly, Watkins et al. (2003) suggest that gratitude may promote happiness by: enhancing the experience, encoding and retrieval of positive events, facilitating coping with negative events, increasing social support, or by buffering the effects of depression. Therefore, there is value in seeking to increase the specificity of our understanding.

The most straightforward explanation proposed is that gratitude is a positive emotion that is pleasant to experience, and may therefore increase well-being simply by increasing positive affect (Wood et al., 2010). However, this is unlikely to be the case. As Wood et al. (2010) acknowledge, associations between trait gratitude and well-being have been found even when controlling for positive affect (Wood et al., 2009; Wood, Joseph, et al., 2008). Therefore, researchers believe that gratitude may have a more specific function, whereby the emotional experience of gratitude broadens the range of thoughts and actions individuals engage with, which serves to build social, cognitive and psychological resources which in turn support well-

being (Alkozei et al., 2018; Wood et al., 2010). The function of positive emotions in creating these positive upward spirals is accounted for by Fredrickson's broaden and build theory (2001; 2004), which is well-supported by empirical evidence (Garland et al., 2010).

Drawing upon the broaden and build principles, Alkozei et al. (2018) propose two causal routes by which gratitude may facilitate the acquisition of social and cognitive resources which support coping, offering further specificity to this proposed mechanism. In their cognitive framework, they posit that grateful thinking (i.e. an active appraisal of the benefits and positive aspects present in one's life) contributes to increased attention to the positive aspects of life and more positive interpretations of life events. They suggest that these positive attentional and interpretation biases in the present may lead to positive memory bias when events are recalled in future. These thinking styles are thought to be associated with increased psychological subjective well-being. Furthermore, they are also theorised to be reflected in neural and physiological changes, which can foster improved physical health.

In their psycho-social framework, Alkozei et al. (2018) suggest that noticing others' good deeds may motivate individuals to consider ways of repaying the benefactor. They assert that expressing gratitude in this way may foster increased prosocial behaviour and social support, which interact to increase relationship quality. This, in turn, could lead to increased physical health and psychological subjective well-being. This account is consistent with McCullough et al.'s (2001) moral affect theory, which posits that gratitude helps individuals to recognise when they have benefited from the moral actions of another, motivates them to behave pro-socially towards others, and reinforces prosocial actions to increase moral behaviour in the future. These functions are thought to strengthen interpersonal relationships, which enhance well-being. Alkozei et al. (2018) suggest that gratitude may increase well-being through either or both pathways, or via an interaction between the two.

Some research has provided initial support for the social and cognitive hypotheses, both individually and in combination. For example, Lin (2016) found evidence for a multiple mediation model whereby social support and coping style were parallel mediators of the relationship between 18 to 22 year olds' trait gratitude and well-being. Similarly, Kong et al. (2020) found that adolescents' trait gratitude was related to their subjective well-being via resilience and social support, both individually and as parallel mediators. However, these findings are not always consistent. For instance, Wood et al. (2007b) found that 18 to 22 year olds' coping style did not mediate the relationship between gratitude and happiness, and only certain thinking styles mediated the link between gratitude and life-satisfaction. Additionally, Froh, Yurkewicz, et al. (2009) found no evidence that prosocial behaviour, social support, gratitude in response to aid,

affect or physical symptoms mediated the relationship between children's trait gratitude and their life satisfaction or positive affect.

There are several possible reasons for these discrepancies, including differences in the countries the studies took place in, the tools used to measure gratitude, and how the authors have conceptualised and measured well-being. Furthermore, the existing theoretical explanations are not specific to children, and do not often state whether they are referring to trait or intervention-elicited gratitude, which may not function through the same mechanisms (Wood et al., 2010). It can also be unclear whether interventions are targeting interpersonal or intrapersonal gratitude, or a combination of both. This highlights the need to synthesise and evaluate the current research, to shed light on the most promising mechanisms that a successful children's gratitude intervention might target (Alkozei et al., 2018; Davis et al., 2016; Emmons & Mishra, 2011). Literature searching has suggested that there is not yet a review available which explores the mediators between children's gratitude and positive outcomes.

Therefore, the aim of the current work was to draw together the empirical evidence for potential mediating factors in the relationship between gratitude (both state and trait) and positive outcomes such as well-being and life satisfaction in children and young people. This review had two aims: to assess the evidence for existing theories regarding the mechanisms by which gratitude seems to promote well-being, and to identify variables which might be most beneficially targeted to improve the efficacy of gratitude interventions for increasing young people's well-being. The research question was 'which variables mediate the association between young people's gratitude and well-being?'. It was hoped that this would provide clarity around whether gratitude interventions should target children's cognitive styles, social behaviour and relationships, a combination of the two, or perhaps something else entirely.

2.4   Methodology

2.4.1   Search Strategy

In August 2020, a systematic search of three electronic databases was conducted. These were PsychINFO via EBSCO, Education Research Information Centre (ERIC) and Web of Science via Web of Knowledge. In line with the research question, the search was for articles including references to gratitude and a mediator, using the exact terms: [(gratitude OR grateful* OR thankful*) AND (mediat* OR mechanism*)]. See Appendix B for the full strategy. Two additional papers were found incidentally during the search. Duplicates of papers returned by multiple databases were removed. The titles and abstracts of the articles were screened against the

exclusion criteria. A research assistant acted as a second rater. At this stage, articles excluded by both raters were removed. Full texts of the remaining articles were assessed for eligibility, and those meeting at least one of the exclusion criteria were excluded, with reasons recorded (see Appendix C). Two thirds of the articles were screened by the second rater. Disagreements were resolved through discussion. A hand-search of the reference lists of the included studies was conducted to identify additional articles relevant to the review, however no further articles were identified.

2.4.2   Selection Criteria

Articles were included on the basis that they related directly to the research question. They were assessed against the exclusion criteria shown in Table 1.

Table 1: *Inclusion and Exclusion Criteria*

Study feature	Inclusion criteria	Exclusion criteria
Article type	Full-text access	No full-text access
	Full text is published or available in English	Full text is not published or available in English
	Article is of any age	
	Article is published and peer reviewed or unpublished	Paper is a thesis and a published paper is available which uses the same data
	Study is conducted in any country	
Topic	Article clearly states it is about trait or state gratitude, operationalised as an intervention or psychological construct, distinct from other intervention elements or study variables	Article is not about gratitude (e.g. it is about a related concept such as awe)
		Gratitude is not measured as a single variable, or is part of a multi-faceted intervention
		Article is about business/ selling/ customers/ consumers
Methodology	Article is an empirical paper using original, quantitative data	Article is not an empirical paper using original, quantitative data e.g. it is a review article or opinion piece
	Study includes a quantitative analysis of at least one variable mediating the relationship between gratitude and well-being/ life-satisfaction	Study does not include a quantitative analysis of at least one mediating variable in the relationship between a gratitude predictor variable and a well-being/ life satisfaction outcome
	Article includes an intervention study or a cross-sectional or longitudinal observational study	

Study feature	Inclusion criteria	Exclusion criteria
		Study uses one person's gratitude to another person as a predictor of that other person's well-being/ life satisfaction outcome
Participants	Study includes at least one sample of participants who are all aged 25 and under Participants are of any nationality, ethnicity and first language Participants are of any sex and gender identity Participants are from any population e.g. students, employees	Study does not include a distinct group of participants who are all aged 25 years and under, or the age range is not stated (unless implied by the setting, e.g. secondary school students)

2.5   Results

2.5.1   Search Results

Eighteen articles were included. During the review process, a published version (Armenta et al., 2020) of one of the included studies (originally a thesis; Armenta, 2018) became available. The more recent version was used in the review. The review process is outlined in the PRISMA diagram in Figure 1.

Figure 1: *PRISMA Diagram of the Review Process*
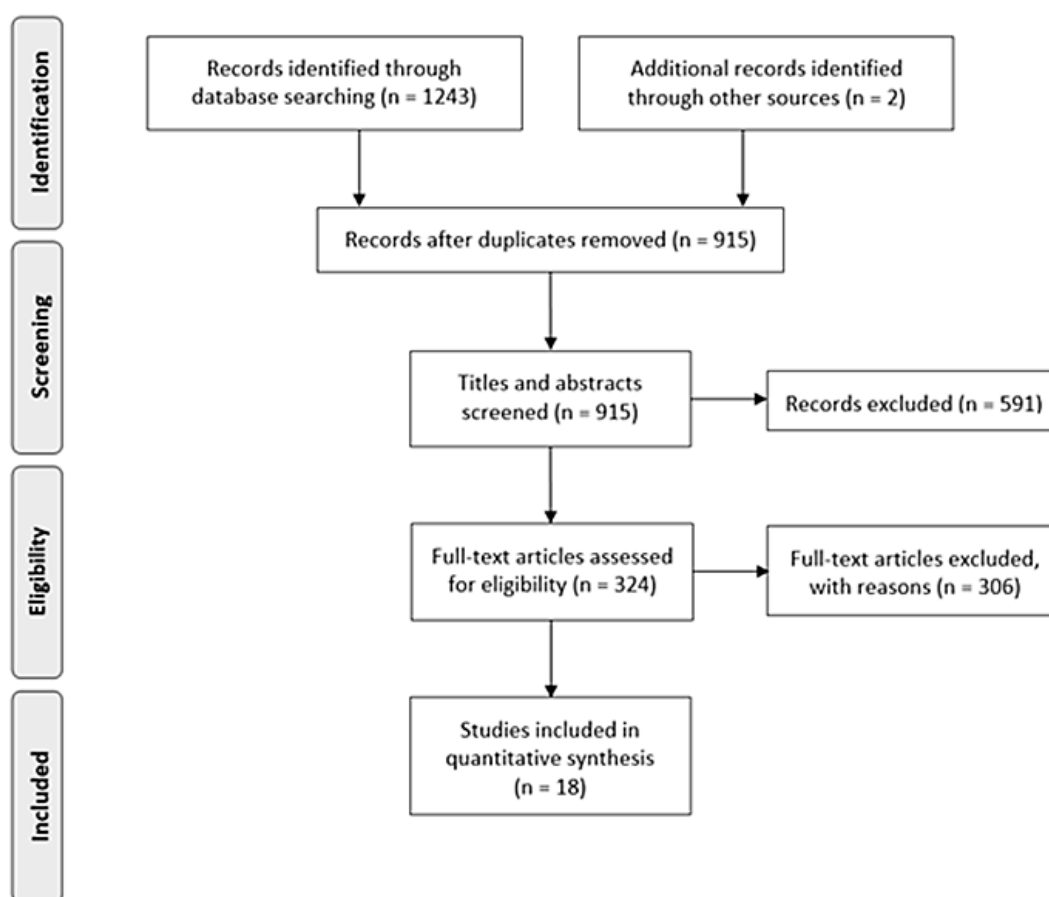
2.5.2   Data Extraction

Two data extraction tables were compiled based on the information needed to summarise the characteristics of the studies (Appendix D), and to answer the research question (Appendix E). The information extracted comprised: the number, age, gender, and ethnicity of participants, the country and setting where the study took place, the design of the study, the measurement tools used, the theoretical framework cited, the methods of analysis and significance testing used and the statistics for any mediation effects that were explored and reported.

2.6   Characteristics of Studies

2.6.1   Publication Details

Of the 18 included studies, all were published and peer reviewed. All studies were published between 2007 and 2020, with 13 being published in 2015 or after.

2.6.2   Theoretical Frameworks

A total of 12 studies cited broaden and build theory (Fredrickson, 2001) to explain why gratitude may enhance well-being via the mediators they investigated. Typically, this rationale was discussed in relation to mediators which could be considered measures of social or psychological resources, including social support, prosocial behaviour, resilience, coping style, and self-esteem. Five studies framed their predictions in the context of self-determination theory (Ryan & Deci, 2000). Studies recruiting this theory investigated autonomy, competence, and relatedness as mediators, as well as measures of overall psychological need satisfaction, meaning in life, and materialism. Three studies drew upon moral affect theory (McCullough et al., 2001). Mediators investigated in these studies included social support, interpersonal relationship disturbance, prosocial behaviour, and gratitude in response to aid. A further three studies utilised Hobfoll's work on resource models (Hobfoll, 1989, 2002). The studies which drew upon this theory investigated mediators such as perceived sports team cohesion, social support, meaning in life, and emotional difficulties.

2.6.3   Setting

All the studies were conducted in education settings. Seven took place in China, three in the United States of America, three in Taiwan, and one each in Singapore, the Philippines, Peru, South Korea and the United Kingdom.

2.6.4   Participants

Across the 18 studies, all participants were between eight and 25 years old. One study was conducted solely with children (ages 10 to 12). Four studies included children and younger adolescents, six samples comprised just adolescents, and seven involved a range of adolescents and young adults.

2.6.5   Design and Analysis

Only one study used an intervention to elicit gratitude and was conducted longitudinally over three months. The other 17 studies utilised observational, cross-sectional designs, using trait gratitude as a predictor variable. All studies used regression to assess mediation effects. Of these, four used Baron and Kenny's (1986) approach and three used Preacher and Hayes' method (Hayes, 2013; Preacher & Hayes, 2008). A further 11 studies used structural equation modelling (SEM). All SEM studies used a statistical test to assess model fit to the data. Additionally, eight

SEM studies used bootstrapped confidence intervals to assess the significance of the mediation effect, and one used an indirect effect test in MPlus5 (Muthén, & Muthén, 2007).

2.6.6   Measurement of Gratitude

In 16 of the studies, a version of the GQ-6 (Mccullough et al., 2002) was used to measure gratitude, including translated versions and one adapted for use with young people. One study used the Gratitude Adjective Checklist (GAC; McCullough et al., 2002) and one used the Inventory of Undergraduates' Gratitude (IUG; Lin & Yeh, 2011).

2.6.7   Outcome Variables

Consistent with the selection criteria of the review, the included studies each measured an outcome variable related to hedonic or eudemonic well-being. While termed slightly differently across studies, the outcomes broadly represented subjective well-being, positive affect, happiness, or life satisfaction, with some of these being school specific (e.g. positive affect in school). Depending on the measurement tool used, some measures of subjective well-being included distinct scales tapping into life satisfaction, as well as positive and negative affect. Overall, 14 studies used satisfaction with life, school, or team as an outcome variable, five used (subjective) well-being or school well-being, and three looked at positive affect (in school) or happiness.

2.7   Quality Assessment

The quality of each study was assessed using a checklist developed by Mansell et al. (2013) and adapted by Lee et al. (2015). See Appendix F for the full checklist. The checklist was designed primarily to assess the quality of observational mediation analysis studies, which made up all but one of the included studies. It consisted of seven questions which could be answered with 'yes' or 'no'. Quantitative quality scores were not used to exclude papers below a certain threshold, but to provide a summary and comparison of the methodological strengths and weaknesses of the studies included in the review. The included articles were quality assessed by two raters (the researcher and research assistant). Disagreements were resolved through discussion between the two raters, leading to the judgements shown in Table 2.

Table 2: *Quality Assessment Checklist*

Study*	Theory cited	Psychometric characteristics reported	Power calculation	Appropriate analysis	Mediator precedes outcome	Predictor precedes mediator	Confounders controlled
Armenta (2020)	1	0	0	1	1	1	1
Caleon (2019)	1	1	0	1	0	0	0
Chen (2013)	1	1	0	1	0	0	0
Chen (2015)	1	1	0	1	0	0	0
Datu (2015)	1	1	0	1	0	0	0
Froh (2009)	1	1	0	1	0	0	1
Jiang (2016)	1	1	0	1	0	0	0
Kong (2020)	1	1	0	1	0	0	0
Lin (2016)	1	1	0	1	0	0	0
Oriol (2020)	1	1	0	1	0	0	0
Sun (2014)	1	1	0	1	0	0	0
Tian (2015)	1	1	0	1	0	0	1
Tian, Pi (2016)	1	1	0	1	0	0	0
Tian, Chu (2016)	1	1	0	1	0	0	0
Tsang (2014)	1	1	0	1	0	0	0

Study*	Theory cited	Psychometric characteristics reported	Power calculation	Appropriate analysis	Mediator precedes outcome	Predictor precedes mediator	Confounders controlled
Wood (2007)	1	0	0	1	0	0	0
You (2018)	1	1	0	1	0	0	0
Zhou (2019)	1	1	0	1	0	0	1

Note. 1 = yes, 0 = no.

*By author first name only (excluding when a paper has same first author as another).

Overall, the 18 studies were relatively homogenous in terms of their methodological strengths and limitations. All included studies cited at least one theoretical framework as a rationale for the mediators they explored. This is a methodological strength because it can help to ensure that the analysis is hypothesis driven, and may reduce the likelihood of researchers reporting significant results based on exploratory post-hoc analyses (Loder et al., 2010). All but two studies reported the psychometric properties of the mediator and outcome variables they measured. In all cases, this primarily involved reporting the Cronbach's alpha coefficients of the measurement tools used (Cronbach, 1951). In the included studies, this helped to make a judgement about the reliability of the measures used, which has bearing on their validity (Tavakol & Dennick, 2011). None of the 18 studies reported a power calculation, which made it more difficult to ascertain whether the sample sizes were sufficient to detect mediation effects. However, as VanderWeele (2020) notes, there is a need for power analysis methods which are easy to use and consistent with the developments in the statistical methods used for mediation analysis. All the included studies used a recognised approach to evaluating mediation effects with some form of significance test.

The sole experimental study in this review was the only one to establish whether changes in the predictor variable and changes in the mediating variable preceded changes in the mediator and outcome variable, respectively. Therefore, it was the only study which could legitimately make comment on a potential causal pathway from gratitude to well-being outcomes. Four studies considered the impact of confounding variables, controlling for life satisfaction at Time 1 (Armenta et al., 2020), positive affect (Froh, Yurkewicz, et al., 2009), gender (Tian et al., 2015) and trauma severity (Zhou et al., 2019).

2.8   Study Findings

2.8.1   Gratitude and Well-being

All 17 observational studies found positive, significant relationships between trait gratitude and the well-being outcomes they measured. In the intervention study (Armenta et al., 2020), life satisfaction decreased over the course of the study, but was significantly greater in the condition where students expressed gratitude, relative to the control group who recorded daily hassles. This was the case at post-test and follow-up.

2.8.2   Mediators

The included studies can be grouped based on the types of mediators they explored. The findings will be discussed under these headings. See Appendix G for definitions of the various mediators explored, as provided by the authors of the relevant studies.

2.8.3   Affect and Emotions

Four studies investigated whether increases in general positive affect, reductions in negative affect, or presence of other specific emotions would play a mediating role in the relationship between gratitude and life satisfaction. In an online intervention study, Armenta et al. (2020) asked students aged 13 to 18 to write gratitude letters once a week for four weeks to someone who had helped them with their health or academic work or done something kind for them. Before writing letters in weeks one and three, they read hypothetical testimonials from peers who described how writing gratitude letters made them feel more humbled, connected, elevated, or indebted. At weeks one and three, students were also asked to write about the costs and intentions of the actions of the person they were grateful to. At week two they wrote about feeling connected and indebted, and at week four they wrote about feeling elevated and humbled. A control group listed their daily activities and completed similar writing activities about being organised. All participants were instructed to spend 30 minutes each week engaging in actions to improve themselves in the domain of their condition (i.e. health, academic work, or kindness) and to write about what they had done to achieve this each week.

A manipulation check confirmed that participants in the three gratitude conditions were significantly more grateful than those in the control condition. Unexpectedly, participants who expressed gratitude reported greater negative affect across weeks one to four, relative to the control group. Interestingly, this predicted relatively greater life satisfaction at post-test, though all conditions showed declines in average life satisfaction throughout the study. The indirect

effect of negative affect was significant at post-test but not at the follow-up three months later. Those in the gratitude conditions also reported relatively greater feelings of indebtedness and elevation, which were significant mediators of the relationship between gratitude and life satisfaction at post-test and follow-up, when controlling for life satisfaction in week one. However, expressing gratitude did not lead to greater humility.

Armenta et al. (2020) suggests that humility did not increase because the gratitude intervention was not strong enough to elicit this emotion in the sample of adolescents, who are at an age where there are more self-focused. No explanation is given in the paper for the finding that participants in the gratitude condition felt more negative across the study. However, the author suggests these participants still showed increased life satisfaction at the end of the study because they were trying to improve themselves. Therefore, experiencing some negative affect was not necessarily a barrier to feeling more satisfied (C. Armenta, personal communication, January 8, 2021). We might wonder whether the relatively greater negative affect arose because the gratitude tasks were more effortful than the control tasks in some way. We also know that those in the gratitude condition felt more indebted across the study. This could have contributed to their negative affect if it was associated with feelings of guilt or 'ungratefulness' for not repaying the kind acts they were acknowledging had been done for them. A criticism of this study is that it is not possible to separate out the effects of writing a gratitude letter, striving to improve oneself, reading other students' testimonials, and writing about the emotional experiences associated with expressing gratitude. Students in the control condition did not write about these emotional experiences, which might explain why those in the gratitude conditions reported relatively greater feelings of elevation, connectedness, and indebtedness. However, the experimental, longitudinal nature is helpful in allowing us to infer some causality between gratitude, emotions, and well-being.

Tian, Chu, et al. (2016) conducted an observational study looking at mediators in the relationship between the trait gratitude and school satisfaction of nine to 13 year olds. They constructed a chain mediation model from trait gratitude to school satisfaction, through prosocial behaviour and positive affect in school. There was a significant indirect effect of trait gratitude on school satisfaction through this pathway, with a standardised effect size of 0.11. Individually, prosocial behaviour had a greater effect (0.21) than positive affect in school (0.07). The same model was constructed, this time replacing increased positive affect in school with reduced negative affect in school. There was a smaller but still significant indirect effect through this path (0.03). The individual effect size of prosocial behaviour was 0.30, and for reduced negative affect was 0.05. Therefore, increased positive affect in school and reduced negative affect in school both mediated the relationship between trait gratitude and school satisfaction, individually and in a

path including prosocial behaviour. In both models, the effect of affect was smaller than that of prosocial behaviour.

You et al. (2018) investigated whether reduced levels of emotional difficulties (e.g. *I worry when I am at school*) mediated the relationship between greater gratitude and greater life satisfaction for 10 to 12 year old students. Structural equation modelling with bootstrapped confidence intervals revealed that fewer emotional difficulties mediated this relationship for male and female students. Although females experienced greater emotional difficulties than males, there was no significant difference between the size of the indirect effect for each group. Conversely, Froh, Yurkewicz, et al. (2009) found no support for mediational effects of any variables between gratitude and life satisfaction or positive affect in 11 to 13 year olds via their proposed mediators, which included general positive and negative affect and gratitude in response to aid, although gratitude was significantly related to positive affect, gratitude in response to aid, and life satisfaction. This study utilised a smaller sample size ($n = 154$), compared with the 324 students included by Tian, Chu, et al. (2016) and the 877 by You et al. (2018), and also had issues with missing data. However, because none of the included studies included a power calculation, it is not possible to identify whether this had an impact on the results. Furthermore, Froh, Yurkewicz, et al. (2009) did not specify any hypotheses regarding these mediational models before the analysis took place, and did not report which specific models were investigated, or any statistics in relation to these analyses. Therefore, the inferences that can be made from these findings are limited.

Overall, one study found that positive affect was a mediator. Two studies found that reduced negative affect or emotional difficulties were mediators. One study found no significant indirect effects of positive or negative affect. Finally, one study found, unexpectedly, that increased negative affect mediated the effect of a gratitude intervention on increased life satisfaction.

2.8.4   Cognitive Resources

Two studies found support for certain coping styles as mediators. Wood et al. (2007b) assessed the potential mediating effects of coping styles in the relationship between trait gratitude, happiness and life-satisfaction in a sample of 18 to 22 year olds. They found that self-blame mediated the relationship between gratitude and life-satisfaction, but not happiness. Greater gratitude was associated with reduced self-blame, which predicted greater life-satisfaction. The other coping styles measured (positive reinterpretation and growth, and behavioural disengagement) were not significant mediators of either relationship, and the

statistics for these negative findings were not reported. Lin (2016) assessed the fit of a parallel mediation model predicting greater well-being from gratitude, through positive coping style (comprised of active emotion-focused and problem-focused coping) and social support, also in 18 to 22 year olds. Positive coping style had a significant, positive indirect effect, both individually, and alongside including social support.

A potential limitation of Lin's (2016) study is that the measures used were all designed by the author (Lin & Yeh, 2011; Lin, 2011). Although the psychometric properties of these scales were reported and showed satisfactory internal consistency, the selection of self-created scales may be a source of bias because the measures may have been designed in a way that makes them more sensitive to the constructs and relationships the author set out to establish. Overall, there is some evidence that coping styles mediate the relationship. However, researchers have conceptualised coping styles in a variety of ways. Therefore, findings about which specific coping styles are mediators have not been consistent.

Two studies looked at meaning in life and its effect on life satisfaction. Datu and Mateo (2015) found that presence of, but not search for meaning in life mediated the relationship between gratitude and life satisfaction in 17 to 21 year olds. Oriol et al. (2020) used the same tool to measure meaning in life but did not investigate the two scales separately. In a serial multiple mediation model, where gratitude was predicted from optimism, they found a significant indirect effect of meaning in life between gratitude and life satisfaction in 14 year old students. One study investigated materialism, which is defined as the value individuals attach to possessions in the pursuit of happiness (Jiang et al., 2016). Jiang et al. found that materialism mediated the relationship between gratitude and school well-being in 18 to 23 year old college students. Students who were more grateful were less likely to have materialistic orientations, which was associated with greater school well-being.

Zhou et al. (2019) examined the cognitive resources of hope and self-esteem (alongside social support) in a model predicting life satisfaction from gratitude. Participants were 13 to 20 year olds who had survived an earthquake two and a half years previously. When trauma severity was controlled for, support was found for mediational paths from gratitude to life satisfaction through hope ($\beta = .047$), social support via self-esteem ($\beta = .013$), self-esteem via hope ($\beta = .016$), and social support to hope via self-esteem ($\beta = .017$). Therefore, there is some evidence that certain beliefs about oneself and the world mediate the relationship between trait gratitude and well-being outcomes. Again, due to the variability in specific mediators explored, it is difficult to make a judgement about the consistency of the results.

2.8.5   Social Resources

Seven studies included social support as a mediator, which can be considered a social resource. Two studies found evidence for social support as a single mediator, one for subjective well-being of 14 to 16 year olds (Kong et al., 2020) and one for life satisfaction in 10 to 12 year olds (You et al., 2018). It also functioned as a parallel mediator between gratitude and well-being in two studies involving older adolescents, alongside resilience (Kong et al., 2020) and coping style (Lin, 2016). Chen (2013) looked specifically at adolescent athletes and found support for a model whereby perceived coach and teammate support were parallel mediators of the relationship between trait gratitude and team satisfaction, with team satisfaction predicting life satisfaction. Sun et al. (2014) found that interpersonal relationship disturbance and perceived social support were parallel mediators in the relationship between gratitude and school well-being, with an additional path from interpersonal relationship disturbance to perceived social support, also in older adolescents and young adults (aged 18 to 23 years). In a model comprising social support, self-esteem and hope as mediators between gratitude and life satisfaction, social support had a significant indirect effect, but only via hope and self-esteem (Zhou et al., 2019). Only Froh, Yurkewicz, et al. (2009) found no evidence for social support as a mediator between gratitude and positive outcomes.

Three included studies explored prosocial behaviour as a mediator. One of which was the study by Froh, Yurkewicz, et al. (2009), who, as already mentioned, found none of their identified variables, including prosocial behaviour, to mediate between gratitude and positive affect or life satisfaction. Tian et al. (2015) found that girls reported greater prosocial behaviour and school satisfaction than boys, and thus controlled for gender in their analyses. Here, prosocial behaviour mediated the relationship between gratitude and school satisfaction, and gratitude and positive affect in school. Tian, Chu, et al. (2016) found that prosocial behaviour mediated the relationship between gratitude and school satisfaction in two separate chain mediating paths, one alongside positive affect in school, and one alongside negative affect in school. With the exception of Froh, Yurkewicz, et al. (2009), all studies exploring social resources found that increased social support or prosocial behaviour mediated the relationship between gratitude and well-being outcomes, either as single mediators or as part of pathways with other variables.

2.8.6   Need Satisfaction

Informed by self-determination theory (Ryan & Deci, 2000), two included studies considered psychological need satisfaction specifically. A further four addressed variables that could be considered similar constructs to relatedness, such as connectedness. Tian, Pi, et al.

(2016) found that, in their multiple mediation model, there were significant paths from gratitude to subjective well-being through competence and relatedness satisfaction individually, and through relatedness and autonomy, and competence and autonomy together. Tsang et al. (2014) found that, in a model predicting life satisfaction from optimism, there was a significant mediation path from gratitude (predicted by optimism), through need satisfaction, to life satisfaction. Therefore, there is some initial evidence that certain types of psychological need satisfaction may play a mediating role between gratitude and well-being.

The similar constructs of connectedness and perceived team cohesion were each found to individually mediate the relationship between gratitude and life satisfaction (Armenta et al., 2020; Chen et al., 2015). In the Armenta et al. intervention study, this effect persisted at the three-month follow up. Relatedness with key social partners was found to mediate the relationship between gratitude and school life satisfaction in early adolescents, both individually and in sequence before school resilience (Caleon et al., 2019). Finally, reduced interpersonal relationship disturbance was found to significantly mediate between gratitude and school well-being, individually and in a model with perceived social support in young adults (Sun et al., 2014). Here, there was a path from relationship disturbance to perceived social support, suggesting that more grateful individuals experienced fewer relationship problems, which was associated with an increased sense of being supported, which in turn was related to greater school well-being. Overall, all four of these studies found evidence for relatedness or a comparable construct as a mediator.

2.8.7 Resilience

There was support from two studies for the explanatory role of resilience, both individually and in multiple mediation models alongside social variables. Kong et al. (2020) found that resilience functioned as a single mediator in the relationship between gratitude and subjective well-being (comprised of life-satisfaction, positive and negative affect measures) in a large sample (N = 1445) of Chinese adolescents. It also served as a parallel mediator alongside social support. In this model, there was no significant difference in the size of the mediation effect between the two variables, suggesting that they explained a similar amount of the variance in the association between gratitude and subjective well-being in this study. In a sequential mediation analysis predicting school life satisfaction from gratitude, Caleon et al. (2019) found a significant indirect effect of school resilience, both independently, and following relatedness with social partners, in 13 to 16 year olds. Therefore, there was a small amount of evidence that greater trait gratitude was associated with greater resilience, which was associated with greater well-being and life satisfaction.

2.9   Discussion

The aim of this review was to identify mediating variables which might explain the relationship between children and young people's gratitude and well-being, in order to shed light on existing theories and suggest potential targets for intervention. The goal was to elucidate whether gratitude promotes positive outcomes through increasing social resources, cognitive resources, a combination of both or via other routes. The 18 included studies analysed a total of 28 potential mediators, in a variety of countries, settings and age groups.

There was limited evidence that children higher in trait gratitude reported greater positive and fewer negative emotions in school, and fewer emotional difficulties. These mediators were associated with greater satisfaction with life and with school in two studies. In Armenta's (2020) study, feelings of elevation and indebtedness also mediated the association between expressing gratitude through an intervention and relatively greater life satisfaction. Conversely, humility did not mediate this association. In this study, expressing gratitude actually led to relatively greater feelings of negative affect, which were then associated with relatively more life satisfaction (Armenta, 2020). It was unclear why the gratitude intervention was associated with greater negative affect, though it may have been related to the effortful nature of the task, or perhaps a feeling of guilt or regret after 'taking stock' and realising they had not expressed their gratitude to those who had helped them in the past.

There were mixed findings for the mediating effect of thinking styles in the relationship between trait gratitude and positive outcomes. In the included studies, being higher in trait gratitude was associated with being less likely to experience self-blame and hold materialistic views and more likely to engage in active and solution-focused coping strategies, identify greater meaning in life, hold a positive view of oneself, and have hope for the future. Some thinking styles such as positive reinterpretation and search for meaning in life did not mediate a relation between gratitude and well-being, and some mediated between gratitude and life satisfaction, but not happiness. In both studies looking at resilience as a mediator in adolescents, there were significant mediational paths through resilience individually, and alongside social variables (social support and relatedness).

Compared with other mediators in this review, relatively more studies investigated social support as a mediator, particularly in conjunction with other social and cognitive variables. The findings of these studies suggested that grateful people may experience greater well-being and satisfaction in their lives, including at school and in their sports teams. Some of this variance appeared to be explained by the fact that they perceived, and/or possessed more supportive social relationships in these settings. Where social support was included in a multiple mediation

model, the addition of a cognitive variable (e.g. coping style, hope, self-esteem) appeared to increase the amount of variance explained. Two studies highlighted prosocial behaviour as a mediator between gratitude and school satisfaction, and gratitude and positive affect in school. In one of these studies, prosocial behaviour was part of two mediating paths, alongside positive and negative affect in school.

The two studies which explored need satisfaction as a mediator also found positive results. One study found that competence and relatedness mediated the relationship between trait gratitude and subjective well-being individually, while autonomy only did so when in a chain with either competence or relatedness. More studies investigated mediators akin to relatedness. Reduced interpersonal relationship disturbance, relatedness with key social partners, connectedness and team cohesion were all significant mediators. Furthermore, in the intervention study, feelings of connectedness were relatively higher in the group who expressed gratitude, and this effect was still present three months later.

Many of the included studies acknowledged their cross-sectional, observational nature as a key limitation of the research (Caleon et al., 2019; Chen et al., 2015; Kong et al., 2020; Tian et al., 2015; Wood et al., 2007b) As Shrout and Bolger (2002, p. 439) highlight, observational, cross-sectional mediation analyses can provide "suggestive rather than definitive evidence" of the relationships between the identified variables, and cannot provide evidence of causality. Another commonly acknowledged limitation of the included studies was the use of self-report measures to examine the key variables, and the potential for this to result in socially desirable responses (Lin, 2016; Tian, Chu, et al., 2016; Tian, Pi, et al., 2016; You et al., 2018).

Furthermore, a substantial proportion of the research in this review was conducted in Asian countries such as China, Korea and Taiwan. As acknowledged by the authors of these studies, the culture in these countries is often defined as collectivist, meaning there is a greater focus on community, common goals and group working (Caleon et al., 2019; Chen et al., 2015). This could explain why social mediators were prioritised for exploration in the included studies, and why they were frequently associated with well-being in these populations. Finally, there is likely to be a degree of publication bias in the evidence base regarding gratitude and well-being, a common problem in psychological research, where positive findings are more likely to be reported (Cook & Therrien, 2017). Few studies found that their predicted mediators did not have an effect, and fewer still reported statistics for their negative findings. Therefore, the included studies may give a positively skewed picture of the true effect of various mediators, making it more difficult to make comparisons between the consistency of the evidence for different proposed mediators.

The limited support in the included studies for reduced negative and increased positive affect as individual mediators is consistent with previous research which has found that gratitude predicts well-being over and above positive affect (Wood, Joseph, et al., 2008; Wood et al., 2009, 2010). The findings add weight to the theory that gratitude may instead enhance well-being by supporting the development of resources (Alkozei et al., 2018; Wood et al., 2010). If gratitude builds resources which facilitate coping, we might expect it to be associated with resilience, which involves adapting to obstacles in life while maintaining well-being (Caleon et al., 2019; Chmitorz et al., 2018). This was the case in the two included studies which explored resilience as a mediator. Furthermore, reduced self-blame and increased active problem and emotion focused coping also mediated the effect of trait gratitude on life satisfaction in two of the included studies, again suggesting that young people higher in trait gratitude might have more effective tools for coping with problems in their lives, which may go some way to explaining their increased life satisfaction.

In their cognitive framework, Alkozei et al. (2018) propose that gratitude may be associated with positive attentional, interpretive and memory biases. The search did not identify any studies that explored memory biases as a mediator in children and young people. With respect to interpretive biases, positive reinterpretation as a mediator was one of the variables which was not supported by research, although it is important to note that only one study investigated it. However, the findings do add tentative support for an explanatory mechanism whereby gratitude may enhance children's well-being by increasing their attention to the positive aspects of themselves and the things they have. This is demonstrated by the presence of self-esteem and reduced self-blame as mediators in this review, which may reflect a more positive and compassionate appraisal of oneself. Although these studies only observed associations between these variables at one point in time, the findings fit with experimental work. For example, Shoshani and Steinmetz (2014) found that a positive psychology intervention involving writing gratitude letters and keeping a gratitude journal was associated with increased self-esteem and self-efficacy in 11 to 14 year olds, as well as reduced symptoms of anxiety, depression and general distress. Similarly, several studies have found that self-compassion may serve as a buffer against the development of mental health difficulties such as depression and anxiety in young people (Muris, 2016; Stolow et al., 2016; Wu et al., 2018).

Lower materialism was also found to be a mediator in this review. Although this was only in one study, it is consistent with a wider body of research suggesting that increased gratitude is associated with reduced materialism, and that lower materialism is associated with greater well-being (Chaplin et al., 2019; Froh, Emmons, et al., 2011; Lambert, Fincham, et al., 2009; Polak & McCullough, 2006). In an intervention study, Chaplin et al. (2019) found that keeping a gratitude journal led to significant reductions in adolescents' materialism, as well as increases in generosity.

Therefore, there is a possibility that gratitude and materialistic orientations might be malleable constructs that could be targeted by interventions as routes to increased well-being. The presence of meaning in life was also a mediator in two studies and was associated with increased life satisfaction. Like lower materialism, this could also be considered to reflect a focus on what one has rather than what one does not have. This positive appreciation is included in some measures of gratitude such as the AI (Adler & Fagley, 2005). When developing this measure, Adler and Fagley (2005) found that out of their eight subscales, the 'have focus' scale was most strongly linked to well-being (Polak & McCullough, 2006). Therefore, if a gratitude intervention was designed to promote positive cognitions, activities that encourage young people to notice the skills and qualities they possess and the non-material things they have which give them meaning may be useful avenues to target.

These non-material aspects of life which give it meaning could be considered intrinsic motivators. Self-determination theory (Ryan & Deci, 2000) states that intrinsic motivation arises from the satisfaction of three basic psychological needs: competence, relatedness and autonomy. Two studies in this review found that psychological need satisfaction mediated the link from trait gratitude to subjective well-being and life satisfaction. In the study which measured the three needs separately, competence and relatedness each explained variance individually and alongside autonomy. We can draw a parallel between the mediating role of competence and autonomy here, and gratitude's association with self-esteem and self-efficacy, because these constructs may all reflect young people's beliefs that they are capable of using their skills to facilitate a positive outcome. Feelings of mastery, agency and self-efficacy have frequently emerged in the literature as being key protective factors in the development of children's resilience (Masten & Barnes, 2018). Thus, gratitude may play a role in promoting coping by helping children to feel competent and efficacious. When taken with the finding that more grateful young people use more active coping styles which are associated with well-being, and are more resilient, it appears that gratitude may well foster cognitive resources which support coping and well-being, consistent with broaden and build theory (Fredrickson, 2001, 2004) and Alkozei's cognitive framework (Alkozei et al., 2018).

Findings from the studies in this review suggest that trait gratitude may be also associated with feelings of relatedness and of being supported socially. Although gratitude elicited through intervention may not function through the same mechanisms, the single intervention study in this review also found connectedness to be a significant mechanism which persisted to a follow-up three months later. This finding is consistent with previous experimental research highlighting the effectiveness of a gratitude diary intervention for children's sense of school belonging (Diebel et al., 2016). It is well-established that relationships and sense of belonging are significant predictors

of emotional well-being, and this is often regarded as particularly important for children and adolescents in schools (Allen et al., 2018; Baumeister & Leary, 1995; Goodenow & Grady, 1993; Masten & Barnes, 2018; Osterman, 2000; Van Ryzin et al., 2009). These results also fit with several theoretical perspectives, suggesting that gratitude may help to build social resources (Alkozei et al., 2018; Fredrickson, 2004; McCullough et al., 2001) and to increase the quality of social relationships (Algoe, 2012). In many of the studies, social resources featured as mediators alongside variables such as resilience and coping. Therefore, it is a possibility that perceived and/or actual social support is a resource that benefits children's well-being by supporting their resilience and ability to cope with life's challenges.

We might wonder whether gratitude simply helps children to recognise the social support they do have, or if it helps them build more, as implied by broaden and build theory (Fredrickson, 2001, 2004) and Alkozei et al.'s (2018) social framework. This review found two studies supporting the view that children's prosocial behaviour may explain some of the link from gratitude to well-being. This suggests that more grateful children do something active which promotes their well-being. Exisiting research has found support for the notion that gratitude fosters prosocial behaviour, both longitudinally as a trait, and when elicited through intervention (Bartlett & DeSteno, 2006; Froh et al., 2010; Grant & Gino, 2010; Yost-Dubrow & Dunham, 2018). We also know that children who show more prosocial behaviour are viewed more positively by their peers (Layous et al., 2012; Pakaslahti et al., 2002; Slaughter et al., 2002; Warden & Mackinnon, 2003), and that peer acceptance is associated with children's social adjustment and achievement in school (Johnson et al., 2000; Ladd et al., 1997). Taken together, these findings suggest that there is value in children expressing and repaying gratitude through their behaviour, as well as experiencing it as simple appreciation for the positives in life.

Overall, the findings of this review highlight the potential of gratitude to foster both cognitive and social resources which support well-being. As Alkozei et al. (2018) acknowledge, these social and cognitive pathways are not necessarily distinct, and likely interact, as highlighted by the studies in this review which identified chain and parallel mediation pathways. The findings also lend support to the view of psychologists who recognise the wide-ranging benefits of gratitude (e.g. Emmons & Mishra, 2011; Watkins et al., 2003; Wood et al., 2010). Though there may be mutliple mechanisms, a commonality is that they appear to faciliate well-being through promoting coping and resilience, rather than simple positive affect. Although most of the studies identified here utilised methods which do not allow us to infer causality, their findings are consistent with other work which has adopted experimental and longitudinal approaches, which helps to bridge the findings to the context of gratitude interventions.

This review is novel in its systematic identification and synthesis of the current literature available assessing mediators in the relationship between children's gratitude and well-being. There are also some limitations of the current work, which must be acknowledged. Firstly, it did not include a systematic search of the grey literature on this topic, due to time constraints. Although it can be labour intensive, grey literature searching offers a number of benefits including increasing the scope of the research included in the review, and reducing the risk of publication bias (Mahood et al., 2014). Therefore, the addition of such a search may have increased the amount and diversity of papers available to draw upon, and in turn, the robustness of any conclusions. Furthermore, whilst the potential impact of publication bias on the findings is acknowledged, there was not an assessment of publication bias in this review. As a result, a clear judgment could not be made regarding the extent of any positive skew in the results of the included studies (Torgerson, 2006).

2.9.1 Implications and Future Directions

This review has implications which are relevant to academics and practitioners seeking to promote the well-being of children and young people. There has been some debate in the literature about the mechanisms by which children's gratitude might promote their well-being. These findings suggest that trait gratitude benefits well-being via multiple pathways relating to social and cognitive resource acquisition, and thereby coping and resilience. Furthermore, it appears that there are benefits of both simple appreciation and expressing gratitude to others. When considered in the context of previous research showing that gratitude interventions appear to induce changes in these mediating variables, these results offer some implications for the design of such interventions. For example, it may be useful to design interventions which help young people recognise the resources and coping strategies they have, both internally, and through the support of social partners. The findings suggest this may be more fruitful than attempting to use these interventions to increase children's positive affect.

In addition, the apparent benefits of targeting interpersonal and intrapersonal gratitude recognition and expression means that we might consider the potential to increase the effectiveness of interventions by designing them to incorporate both elements. This is something future research might usefully address, considering that multi-faceted gratitude interventions might also have drawbacks such as being confusing, overwhelming, or undermining the autonomy and intrinsic motivation for children to express the type of gratitude that feels most relevant for them (Layous & Lyubomirsky, 2014). Furthermore, the lack of experimental and longitudinal evidence in this review highlights the need for future intervention studies to explore potential mediating variables between gratitude conditions and associated well-being outcomes.

Chapter 3   Empirical Paper

3.1   Title

Development and Validation of The QUAY: A New Questionnaire Measure of Children's Gratitude

3.2   Abstract

A self-report measure of children's gratitude is needed to identify those who may benefit from gratitude interventions, and to evaluate their impact. Limitations of adapting existing measures include inaccessible language, ceiling effects, and limited scope. The aim of this study was to develop an accessible, sensitive, and comprehensive children's gratitude questionnaire. Twenty-seven items were written and refined in an iterative process, using a review of the gratitude literature, focus group feedback from children, and consultation with experts. Exploratory factor analysis with 107 children's responses led to the development of an 11-item measure with three subscales addressing gratitude, appreciation, and sense of privilege. The scales showed satisfactory to good reliability, and convergent validity with the GQ-6. Further research is needed to confirm the factor structure and discriminant validity. Nevertheless, this study provides initial evidence for the utility of a new measure, the Questionnaire of Appreciation in Youth (QUAY).

Key words: gratitude, appreciation, privilege, questionnaire, measurement, children, young people

3.3   Introduction

Gratitude can be defined as a feeling of thankfulness. It can be felt towards another person for a specific kind act, or as a more general sense of appreciation for a positive experience like enjoying beauty in nature (Peterson & Seligman, 2004). It can occur as both a stable trait and a state in the form of a mood or emotion (Emmons et al., 2019; Wood, Maltby, et al., 2008). In the literature, it is generally considered to comprise affective, behavioural and cognitive components (Halberstadt et al., 2016; Rusk et al., 2015). Grateful responses are understood to emerge in children as young as five years old (Hussong et al., 2019; Nelson et al., 2013) and to increase in sophistication over time (de Lucca Freitas et al., 2011). Individuals higher in trait gratitude are often found to experience greater well-being, and this seems to be the case for people of all ages (Chopik et al., 2019). Consequently, researchers have begun to explore whether gratitude can be increased via intervention, and whether this approach has efficacy for promoting positive social and emotional outcomes.

The evidence for the effectiveness of gratitude interventions for promoting well-being is generally promising, though questions remain as to the conditions under which they are most efficacious (Dickens, 2017; Froh, Kashdan, et al., 2009). A notable caveat is that, in some studies, they seem to be more effective for those initially lower in trait gratitude (Rash et al., 2011). Given the ongoing concern regarding the emotional well-being of young people, schools are a setting where gratitude interventions could be particularly beneficial (Bono et al., 2020; Renshaw & Olinger Steeves, 2016). Indeed, there is evidence that asking young people in schools to engage in practises such as keeping a gratitude diary and a writing gratitude letter has an impact on outcomes such as positive affect and sense of school belonging (Diebel et al., 2016; Froh, Kashdan, et al., 2009). However, evaluation of the effect of such interventions is currently limited by the tools available for measuring young people's gratitude.

One of the most frequently used measures of gratitude with children and young people is the Gratitude Questionnaire Six Item Form (GQ-6) designed by McCullough et al. (2002). This is often adapted for use in children and is reported to show similar psychometric properties in young people, compared with those seen in adults (Froh, Fan, et al., 2011). It comprises six items primarily addressing the intensity, density, frequency and span of grateful affect (Froh, Fan, et al., 2011; Hussong et al., 2019) with items such as '*I am grateful to a wide variety of people*'. Respondents indicate their agreement with each statement on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Other examples of questionnaire measures include the Appreciation Inventory (AI; Adler & Fagley, 2005) which comprises eight subscales measuring different aspects of gratitude and appreciation (*"have" focus, awe, ritual, present moment, self/social comparison, gratitudes, loss/adversity* and *interpersonal*) and the Gratitude, Appreciation, and Resentment Test (GRAT; Watkins et al., 2003) which is made up of three scales (*sense of abundance, simple appreciation* and *appreciation of others*). There is also the Gratitude Adjective Checklist (GAC; McCullough et al., 2002) which requires respondents to rate their experience of three adjectives (*grateful, thankful, appreciative*) over a given timeframe, and the Inventory of Undergraduates' Gratitude (IUG; Lin & Yeh, 2011) which has five factors (*thanks others, thanks God, cherish what you have, appreciate the hardship,* and *appreciate the moment*).

There are several reasons why the existing options for measuring children's gratitude are of limited utility for evaluating the impact of gratitude interventions. One of the most obvious is that using measures originally designed for adults means that much of the language is inaccessible, particularly for younger children. For example, although it is one of the most frequently used measures of gratitude in children, item six of the GQ-6, '*long amounts of time can go by before I feel grateful to something or someone*', has been identified by young people as being too abstract and difficult to understand, and is sometimes removed from the questionnaire

before use with children (Froh, Fan, et al., 2011). Another issue with the GQ-6 is the possibility of ceiling effects. Several researchers have suggested that this may have impacted the ability of their studies to detect changes in gratitude following a gratitude intervention, as participants' scores started close to the ceiling of the measure (e.g. Gabana et al., 2020; Moieni et al., 2018; Schache et al., 2020).

Another limitation is recognised by Lambert, Graham, et al. (2009) and Morgan et al. (2017), and is related to issues with the way that gratitude is defined and operationalised. For example, although Wood, Maltby, et al. (2008) find interpersonal and intrapersonal gratitude to be closely-related but distinct aspects of gratitude, this is not always clearly reflected in measurement tools. Morgan et al. (2017) describe how Watkins et al. (2003) define gratitude as being interpersonal in response to a favour, yet they include items in the GRAT that appear to tap into intrapersonal gratitude, such as an appreciation of nature. Similarly, gratitude is widely considered to comprise cognitive, affective, and behavioural elements (Hussong et al., 2020; Rusk et al., 2015). However, many measures do not include items capturing each of these elements (Hussong et al., 2019; Morgan et al., 2017). For example, the GQ-6 does not include items concerning behaviour or cognition (McCullough et al., 2002). As Clark and Watson (2019) emphasise, questionnaire measures of personality traits should be clear about the boundaries, structure and hierarchies of their target constructs if they are to have construct validity. Therefore, the initial item pool for such a tool should reflect themes identified through systematic analysis of relevant literature (Clark & Watson, 2019).

This lack of multi-dimensionality may be particularly problematic when measuring gratitude in children, because it could contribute to a failure to capture some of the less-sophisticated expressions of the trait, which appear early in childhood when gratitude is still developing (Hussong et al., 2019). Building on work by Baumgarten-Tramer (1938), de Lucca Freitas et al. (2011) found that children's gratitude expressions develop over time. They move from ego-centric expressions which involve repaying a benefactor with something they themselves would like, towards expressions which are more social and emotional in nature. Therefore, a measure which does not address these behavioural expressions may be less sensitive towards differences in children's gratitude, both in terms of changes within individuals over time and individual differences within groups of children of a similar age. Furthermore, a comprehensive measure needs to capture the most sophisticated aspects of gratitude that children might report, to avoid ceiling effects. Language is particularly important here, as these more complex aspects need to be worded in such a way that children can recognise them and respond appropriately.

To combat some of these limitations, Hussong et al. (2019) have recently developed a battery of assessment tools for measuring children's gratitude, including a daily diary for parents, and scenario-based and behavioural tasks for the child. While comprehensive, it is more time and labour intensive than traditional measures, requiring involvement from a parent and a research assistant. Therefore, there remains a requirement for an easily accessible self-report tool for schools to use to measure the impact of gratitude interventions. This new tool should use child-friendly language, be sufficiently comprehensive to capture the multiple facets of gratitude and be sensitive to differences within and between individuals. The purpose of this research is to design, test and improve such a measure, through a series of iterative stages.

It is hoped that this new questionnaire measure will be of use to researchers seeking to evaluate the impact of gratitude interventions for children and young people, and to identify those with lower trait gratitude, who may benefit the most from intervention to improve their psychological well-being. The questionnaire will be developed with the aim of piloting it with children in school years 4 and 5, because these children are likely to be in the process of developing the trait of gratitude, and therefore at an age where their gratitude may be enhanced by an intervention (de Lucca Freitas et al., 2011). It will be designed primarily to measure trait gratitude, taking the view that a) the trait can include more momentary states such as moods and emotions, and b) the trait is malleable over time in response to intervention.

The aims of this paper are as follows:

- **Aim 1:** Develop a new child-report measure of gratitude which encompasses all facets of gratitude highlighted in the extant literature.
- **Aim 2:** Explore and improve the accessibility of the language and concepts in the questionnaire with feedback from the target population (children aged eight to 10).
- **Aim 3:** Assess the measure's factor structure, internal consistency, and convergent validity with an existing measure of gratitude, the GQ-6.

3.4   Method

3.4.1   Questionnaire Development

3.4.1.1   Item Writing

Following guidance from recent literature on questionnaire development (Carpenter, 2018; Clark & Watson, 2019), the researcher began by reviewing the extant literature in order to define gratitude as a construct. The work of Rusk et al. (2015), who conducted a thematic analysis of relevant literature on gratitude and appreciation was a key paper that was drawn upon. Rusk et

al. identified 32 theoretical components of gratitude, organised into five overarching domains of positive functioning: *attention and awareness*, *comprehension and coping*, *emotions, goals and habits*, and *relationships and virtues.* These appeared to fit well with more recent work highlighting that children's gratitude comprises awareness, thoughts, feelings and behaviour (Halberstadt et al., 2016; Hussong et al., 2019). It was also consistent with the broader conceptualisation of gratitude originally endorsed by Peterson & Seligman (2004), as something which could be felt in response to a gift from another person, or as a more general appreciation for a positive experience.

The questionnaire items were written in accordance with these theoretical aspects of gratitude, using Rusk et al.'s (2015) five areas as a framework. See Appendix H for a summary of how each concept in the literature was incorporated in the initial questionnaire. On the advice of Clark and Watson (2019), the initial item pool was designed to be over-inclusive, comprising 27 items. It was not necessarily expected that the factor structure of the measure would reflect these five domains, because there was a certain degree of semantic overlap between them. Furthermore, the number of items was likely insufficient to be distributed between five factors.

3.4.1.2   Response Options

The researcher opted to use a Likert scale response system, with five items ranging from 1 (*never*) to 5 (*always*). This decision was based on research indicating that increasing the number of response items increases scale reliability, but not once there are more than six choices (Simms et al., 2019). This study also found minimal differences in the psychometric quality of scales with an odd or even number of options, and minimal discrimination between four, five and six options (Simms et al., 2019). The researcher chose five choices with the aim of maximising reliability and minimising the complexity of the scale for children. Furthermore, it was decided that a frequency scale rather than a level of agreement scale would be used because it was felt that this would be more concrete for children and better suited to capturing the behavioural aspect of gratitude which is salient for children in the target age range (de Lucca Freitas et al., 2011). The new measure was named the Questionnaire of Appreciation in Youth [QUAY].

3.4.1.3   Questionnaire Refinement

To refine the initial items, they were shared with the two research supervisors, who have both worked on several research projects about children's gratitude. One was also a practicing educational psychologist (EP) with extensive experience in working with children in the target age range. The items were discussed collaboratively, and potentially ambiguous items were identified and reworded. Following this, the items were screened with a group of three children in Year 4 at

a local mainstream primary school. This process highlighted specific items where misconceptions arose. As a result, the items were refined further, again in collaboration with the supervisors. See Appendix I for details of how the items were refined over time.

3.4.1.4   Focus Group

Ethical approval for the focus group and subsequent questionnaire validation process was provided by the University Ethics Committee (Appendix J). Participants for the focus group were three children from a local primary school. Two were female and one was male, and all were aged eight to nine years. They were selected as part of a convenience sample comprising children who were in school during the partial school closures due to the Covid-19 pandemic, and whose parent or carer read the information sheet (Appendix K) and returned the consent form (Appendix L) before the focus group took place. The school was asked to participate because they were an existing contact of one of the research supervisors in their role as an EP. They were contacted by email. The headteacher read the school information sheet (Appendix M) and provided written consent for the school to participate (Appendix N). Following this, the school shared the parent/carer information sheet with six parents/carers of children in a Year 4 and asked them to sign and return the consent form if they were happy for their child to be involved. Parents/carers of three young people returned the form in time for the focus group and these comprised the final sample.

The focus group was held in January 2021 via video link. This was due to the university's risk assessment protocols for conducting field research during the Covid-19 lockdown. A member of teaching staff set up the video call and worked in the corner of the room while the focus group took place. At the start of the call, verbal assent was gained from the children, and they were reassured that they could leave at any time without consequence. The researcher asked them to explain what each questionnaire item meant to them, to give some examples of the concepts in action, and to explain how they would use the rating scale to record their responses. A semi-structured script was used to this end (Appendix O). To finish, the researcher gave a short verbal debrief to the children. A 'thank you' postcard was sent to the school for each child who took part.

The focus group lasted for approximately 45 minutes. The researcher read each item in order and asked for the children's reflections in line with the semi-structured script. The children appeared engaged throughout the focus group, so the researcher judged that it was not necessary to include a break. Furthermore, the researcher observed that the children appeared to enjoy the task. They presented as enthusiastic and seemed to take pride in identifying that they experienced and expressed gratitude for various aspects of their lives. These observations added

weight to the researcher's understanding of gratitude as something that can contribute to well-being, particularly when it appears to arise from an intrinsic motivation driven by an understanding of how gratitude can be beneficial. The children's reflections also fed into the re-wording of some of the items. Their responses highlighted items that they found more difficult to understand, either due to the language used, or a particular concept that did not seem to resonate with them so strongly. During the factor analysis that followed, the researcher was able to refer back to children's reflections on particular items in conjunction with the output of the statistical analysis, to help inform decisions about whether or not to exclude them.

3.4.2   Questionnaire Validation

3.4.2.1   Procedure

An online form was compiled using the Qualtrics platform. This comprised an information sheet (Appendix P), parent/carer consent and child assent statements and tick boxes (Appendix P), the GQ-6 questions (Appendix Q), the QUAY questions (Appendix R), and a debriefing statement (Appendix P). Parent/carer and child names were not collected. The questionnaire was circulated via two key routes. The first was via local primary schools. Senior leaders at 16 schools in the South East of England were contacted by email based on the researcher and one of the research supervisors' links with local schools formed through their roles as a trainee and qualified EP. Six schools agreed to circulate the Qualtrics link to all parents/carers of children in Years 4 and 5 at their schools via email. This route yielded relatively few responses ($n < 20$). As a result, the study was subsequently advertised on various online groups and forums for parents such as parenting Facebook groups, using wording and/or an image with text which signposted to the Qualtrics link (Appendix S). Again, the number of further responses was lower than anticipated ($n < 20$).

Therefore, in April 2021 it was decided that a £10 Amazon voucher would be offered as an incentive to the next 70 participants to complete the online form. This number was chosen due to budget constraints and the number of participants needed. At this point, the information sheet, study adverts and questionnaire completion page were updated to reflect the incentive, allowing participants to provide their email addresses in order to claim a voucher at the end of the form (on a separate screen to preserve the anonymisation of the preceding data). The study was readvertised on some further parenting sites, such as Mumsnet.com. The incentive had a significant impact on response rates, yielding 92 additional responses. Consequently, 92 vouchers were given out due to the exceptional level of demand and the speed at which these responses were received. At this point, the Qualtrics form and study advertisements were updated to reflect

the end of the offer and the cessation of data collection. All responses were collected between February and April 2021.

Once parent consent and child assent were given via the Qualtrics form, children were asked to provide their age, school year group and gender. This was followed by the GQ-6 instructions and questions, then the same for the QUAY. Parents/carers were asked to support their children to give their responses, by helping them to read the items if needed. They were instructed to let the children choose their responses independently.

3.4.2.2 Data Management

Responses were completely anonymous and no identifying information was collected. An exception to this was for participants who followed the link at the end of the form to a separate Qualtrics form where they could record their email address in order to claim an Amazon voucher. Email addresses were not linked to questionnaire responses and were deleted once all vouchers had been circulated. The Qualtrics data for questionnaire responses was saved on a secure password protected laptop in line with the University's data management guidelines.

3.4.2.3 Participants

Responses were received from 137 children. Responses were excluded if: an adult did not record their consent ($n = 8$), the child did not record their assent ($n = 7$), the child was not in the age range ($n = 15$), the concentration check question was answered incorrectly ($n = 1$; see *measures* section below), completion time was less than two minutes ($n = 12$), or if all items on the longer questionnaire (the QUAY) were answered identically ($n = 0$). The responses of participants who did not continue to the end of the form were automatically removed by Qualtrics after 24 hours, because it was specified that participants could stop before the end if they did not want their responses to be used. Useable responses were gained from 107 children, aged eight to 10 ($M_{age} = 8.93$, $SD = 0.68$). There were 67 male and 40 females.

3.4.2.4 Measures

3.4.2.4.1 QUAY (Smith, Woodcock & Brignell, 2021)

The survey version of the QUAY consisted of 27 items relating to all aspects of gratitude identified in the extant literature. Respondents indicated how often each statement was true for them on a scale from 1 (*never*) to 5 (*always*). Possible scores on this initial version ranged from 27 to 135. See Appendix R for the full questionnaire. Within the Qualtrics version of the QUAY, a concentration check question was added between items 16 and 17 (Question: *Just checking you're concentrating, what colour are bananas?* Answers: *Red, Yellow, Purple* or *Blue*).

3.4.2.4.2   Gratitude Questionnaire Six Item Form (GQ-6; Mccullough et al., 2002)

The GQ-6 consists of six items relating to grateful affect. Respondents indicate how much they agree with each statement using a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). The five-item children's version has been validated with 10 to 11 year olds, indicating good internal consistency (α= .81) (Froh, Fan, et al., 2011). Within a possible scoring range of five to 35, the mean score in Froh's sample was 30.44, with a standard deviation of 4.37 and an actual range of 16 to 35. In the current, slightly younger sample, the mean score for the first five items was 24.23 (*SD* = 3.03). Scores ranged between 16 and 29, and Cronbach's alpha was .72. When the sixth item was included, alpha dropped to .60 (*M* = 33.89, *SD* = 4.68, *range* = 22- 42). Item 6 also showed a weak correlation with other items, with a corrected item-total correlation of .099. See Appendix Q for the full questionnaire. For clarity, the five-item version of the GQ-6 will henceforth be termed the GQ-5.

3.5   Results

3.5.1   Item Response Distribution

Analysis of the response distribution on the 27 QUAY items highlighted that the whole scale was used for nine of the items. Four out of the five response options were used on 13 of the items and three of the options were used on five items. These items were retained because over half of the scale points were used. Furthermore, Field (2013) suggests that the normality assumption can be violated in exploratory factor analysis (EFA), particularly if significance testing is not being used, and if there is no attempt to generalise the results beyond the current sample. Table 3 shows the range of responses for retained items.

3.5.2   Exploratory Factor Analysis

EFA was performed on the initial 27 QUAY items. Principal Axis Factoring was used with the aim of developing a theoretical solution. Oblique, Direct Oblimin rotation was used because it was anticipated that factors would be correlated, based on the extant literature concerning the facets of gratitude. Decisions regarding how many items and factors to retain were based principally on the EFA output and the internal consistency coefficients for any subscales emerging. Where judgements based on statistics were less clear cut, the researcher also drew upon their theoretical knowledge of gratitude, in order to generate a solution that balanced both statistical reliability, and construct validity.

Items 13 (*There are lots of things I would like to change about my life),* 16 (*The best things in life are expensive presents*) and 22 (*It takes me a long time to feel better after something annoys me*) were removed after the first analysis because they showed few significant correlations with other items (six, six and four significant correlations respectively). The analysis was repeated without these items, and items 5 (*I feel jealous of other children*), 14 (*It is important to say 'thank you' if someone does something nice for you*) and 21 (*I feel more thankful when someone does something for me if it has taken them a lot of effort*) were removed at this stage due to low communalities (.186, .349 and .198, respectively). Following this, the communality for item 18 (*My friends and I do kind things for each other*) was .395 and it was subsequently removed. Once the analysis was run again without these items, scrutiny of the determinant ($|R|$ = 0.0000366), KMO (KMO = .864; KMO_{min} = .754), Bartlett's test (χ^2 = 985.84, p < .001), anti-image matrix, communalities (min = .408) and reproduced correlation matrix suggested that the data were appropriate for factor analysis of the remaining 20 items.

At this stage, the scree plot and Eigenvalues indicated that a four factor solution was a good statistical fit to the data. However, one of the factors comprising items 2 (*People help and support me*), 4 (*Simple things can make me happy*) and 20 (*People around me want me to have a happy life*) did not make theoretical sense, and the internal consistency of this scale was relatively poor at .66. Furthermore, item 2 had a weak factor loading at .33. Additionally, item 27 (*I remind myself to be thankful*) was negatively correlated with several of the other items. The item was deemed to have been poorly worded and confusing for children and was removed. Therefore, items 2, 4, 20 and 27 were removed and the analysis was re-run without them. Item 8 (*I can think about the things I am grateful for to cheer me up if I am feeling sad*) was removed after this round of analysis due to a low communality (.371). After the analysis was re-run, scrutiny of the scree plot and Eigenvalues suggested that a three-factor solution was more appropriate. Therefore, three factors were specified in the next analysis. At this point, items 1 (*I can easily think of lots of things I am thankful for*), 7 (*I am a grateful person*), 24 (*Taking time to be thankful is something I try to do each day*) and 25 (*I notice when good things happen in my day*) had low factor loadings (.363, .424, .422 and .370, respectively) and were removed.

A final analysis was run with the remaining 11 items. It was run with and without a specified number of factors, yielding the same result. A three factor solution remained appropriate, based on the scree plot and Eigenvalues. This solution made good theoretical sense, and met the necessary assumptions indicating that factor analysis was appropriate ($|R|$ = 0.010; KMO = .834; KMO_{min} = .766; χ^2 = 461.54, p < .001). Extracted communalities were largely above .5, excluding four items which had values between .4 and .5 (min = .410). These items were considered theoretically significant and therefore not sufficiently deviant to merit removal.

Factors were moderately correlated (Table 4), suggesting that an oblique rotation remained appropriate.

The three factors had Eigenvalues of 4.82, 1.36 and 1.08 and explained 43.8%, 12.3% and 9.8% of the variance respectively. Together, they explained 65.1% of the variance in the model. All items loaded meaningfully onto the factors, with loadings above 0.45 (Comrey & Lee, 1992). Factors were titled based on the theoretical similarities between items. Factor 1 comprised items related to feeling thankful for kind acts and positive events and behaving gratefully in response to these feelings. This factor was termed *gratitude*, as its items broadly addressed the traditional definition of the construct. Factor 2 appeared to be more cognition based, reflecting children's understanding that they had a good life where people looked out for them. Therefore, it was named *sense of privilege.* Factor 3 items seemed to tap into an orientation to notice and appreciate small, simple positive things. This was consistent with the literature on appreciation, and thus this factor was termed *appreciation.* Table 3 shows the extracted communalities, factor loadings and descriptive statistics for each item onto the relevant factor.

Table 3: *Results from Exploratory Factor Analysis with the QUAY*

Factor	Item	Communalities	Factor loading	*M* (*SD*)	Min.	Max.
Factor 1 *Gratitude*	26. I feel happy if someone does a kind thing for me	.563	**.803**	4.64 (.57)	3	5
	23. I like being thankful	.657	**.786**	4.45 (.72)	3	5
	10. If someone does a kind thing for me, I will do something kind back	.418	**.660**	4.38 (.75)	2	5
	19. When something good is happening, I try to enjoy it as much as I can	.577	**.581**	4.32 (.82)	2	5
	11. I feel happy to have the life that I have	.566	**.554**	4.43 (.83)	2	5
	3. I have lots of things in my life to be thankful for	.559	**.512**	4.45 (.72)	3	5
Factor 2 *Sense of privilege*	9. I am so lucky compared to some other children	.737	**.880**	4.10 (.91)	2	5
	15. Other people give up their time to help me	.418	**.532**	3.95 (.91)	1	5
Factor 3 *Appreciation*	17. I think about good things that have happened to me in the past	.533	**.753**	3.72 (.82)	2	5
	6. Small good things can happen, even on a bad day	.410	**.581**	3.51 (.88)	1	5
	12. I look around and feel amazed by the things I see	.485	**.563**	3.87 (.79)	3	5

Table 4: *Correlations Between QUAY Factors*

Subscale	Gratitude		Sense of privilege		Appreciation	
	r	95% CI	*r*	95% CI	*r*	95% CI
Gratitude	-	-	.40*	[.21, .58]	.56*	[.44, .67]
Sense of privilege	.40*	[.21, .58]	-	-	.38*	[.22, .54]
Appreciation	.56*	[.44, .67]	.38*	[.22, .54]	-	-

*Correlation significant at $p < .001$

3.5.3 QUAY Scoring

It was decided that the scoring procedure for the measure in its current form would include multiplying the total two-item *sense of privilege* subscale raw score by three and the three-item *appreciation* subscale total raw score by two, so that these subscale totals could be compared with the six-item *gratitude* subscale total, on the same scale of six to 30. The total score was calculated from the mean of the three scaled subscale scores. These proportional totals are referred to as *scaled scores* in any relevant output.

3.5.4 Internal Consistency

Cronbach's alpha coefficients were calculated for the overall QUAY, and the three subscales (Table 5). Three of the scales showed at least acceptable reliability, with the *sense of privilege* scale just below .70. In no case did deleting an item increase the reliability of any of the scales.

Table 5: *Internal Consistency of the QUAY Subscales*

Scale	*N*	*M* (*SD*)	Range	α	Descriptor	Corrected item-total correlations
Full QUAY	105	24.27 (3.20)	15.67 - 30	.86	Good	.43 − .69
Gratitude	106	26.64 (3.42)	17 - 30	.86	Good	.57 − .72
Sense of privilege	107	24.17 (4.75)	12 - 30	.69	Questionable	.52 − .52

Appreciation	106	22.15	14 - 30	.71	Acceptable	.50 – .58
		(3.95)				

Note. Descriptive statistics are calculated from scaled scores.

3.5.5   Convergent Validity

Bivariate Pearson's correlations with bootstrapping were used to assess the relationship between the QUAY scales and GQ-5 and GQ-6 (Table 6). The full QUAY and the GQ-5 and GQ-6 were significantly positively correlated with large effect sizes. Similarly, the *gratitude* subscale of the QUAY showed large, significant, positive correlations with the GQ-5 and GQ-6. The *sense of privilege* and *appreciation* subscales showed significant positive correlations, with medium effect sizes. QUAY correlations with the GQ-5 were slightly higher than those with the GQ-6, likely reflecting the improved reliability of the five-item version.

Table 6: *Convergent Validity of the QUAY with the GQ-5 and GQ-6*

Scale		GQ-5		GQ-6	
	N	r	95% CI	r	95% CI
Full QUAY scale	105	.68*	[.59, .77]	.60*	[.48, .70]
Gratitude	106	.73*	[.61, .82]	.70*	[.59, .78]
Sense of privilege	107	.47*	[.29, .65]	.38*	[.21, .54]
Appreciation	106	.45*	[.29, .58]	.40*	[.25, .52]

Note. Correlations calculated from scaled scores.

*Correlation significant at *p* < .001.

3.5.6   Distribution of Scores

As illustrated by Figures 2 and 3, children's total scores on the GQ-5 and the QUAY had relatively similar distributions. On both questionnaires, most scores fell within two standard deviations of the mean. While a small proportion of scores fell below two standard deviations of the mean on both measures, neither measure had scores more than two standard deviations above the mean, because of the number of children who had similar scores towards the top end of the scales. As shown in Figure 4, the QUAY did not show greater distribution at the top end of the scale than the GQ-5. In fact, ceiling effects were observed on the QUAY but not on the GQ-5.

Figure 2: *Distribution of QUAY Total Scaled Scores*
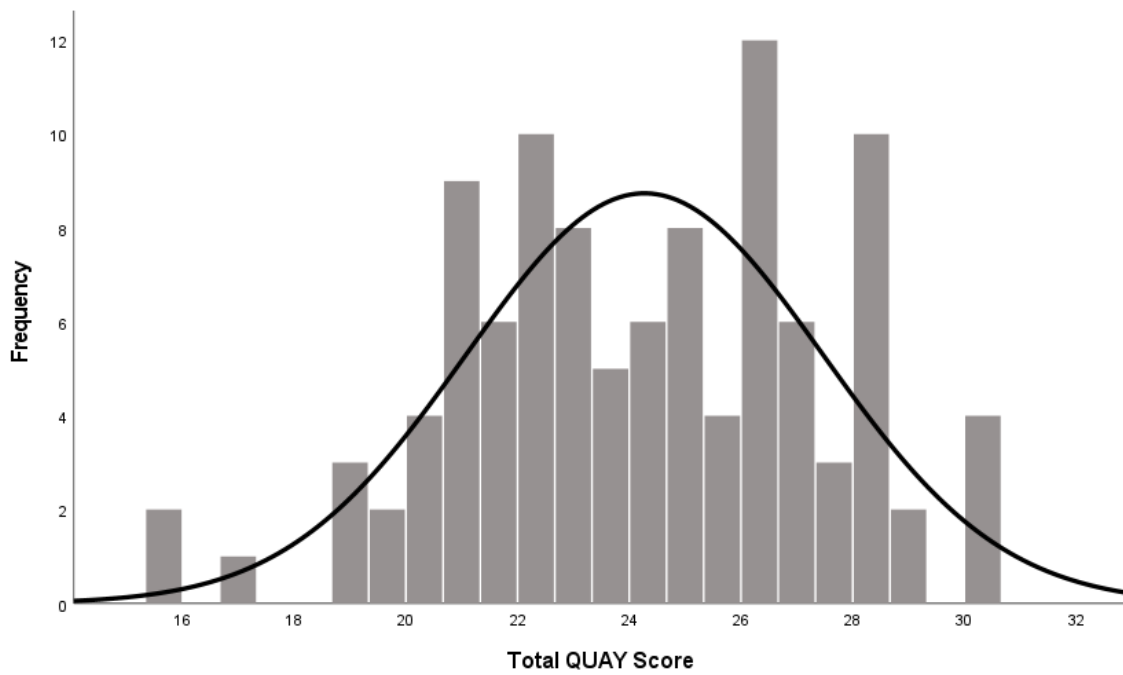
Figure 3: *Distribution of GQ-5 Total Scores*
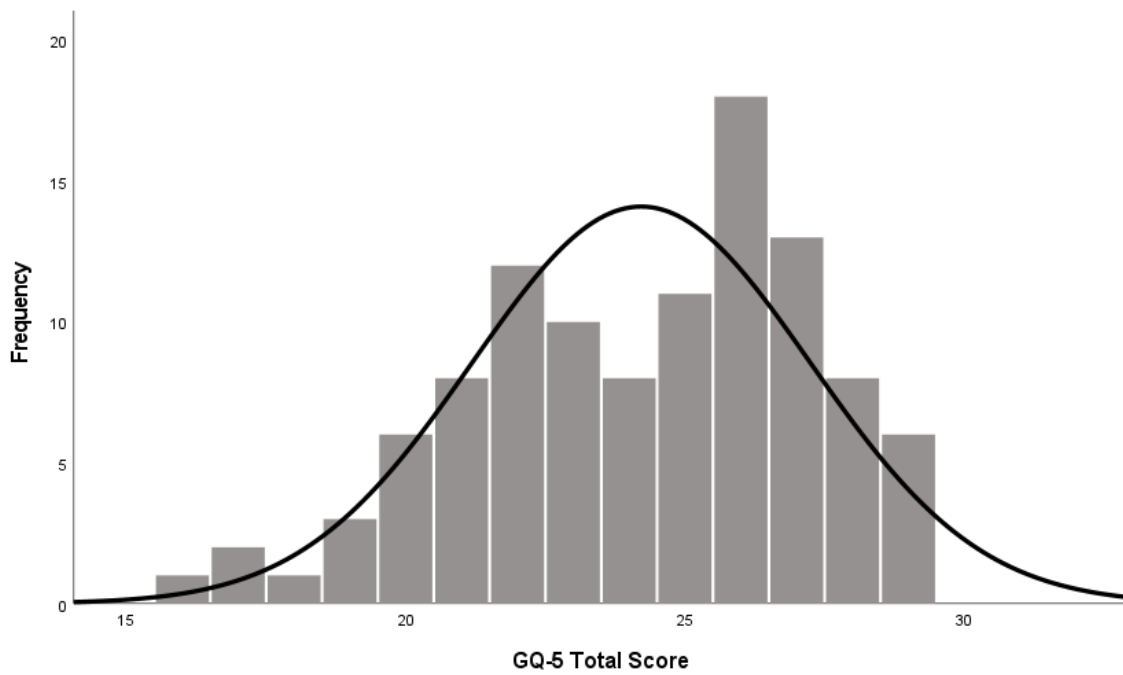
Figure 4: *Bivariate Distribution of Total Scores on the QUAY and GQ-5*
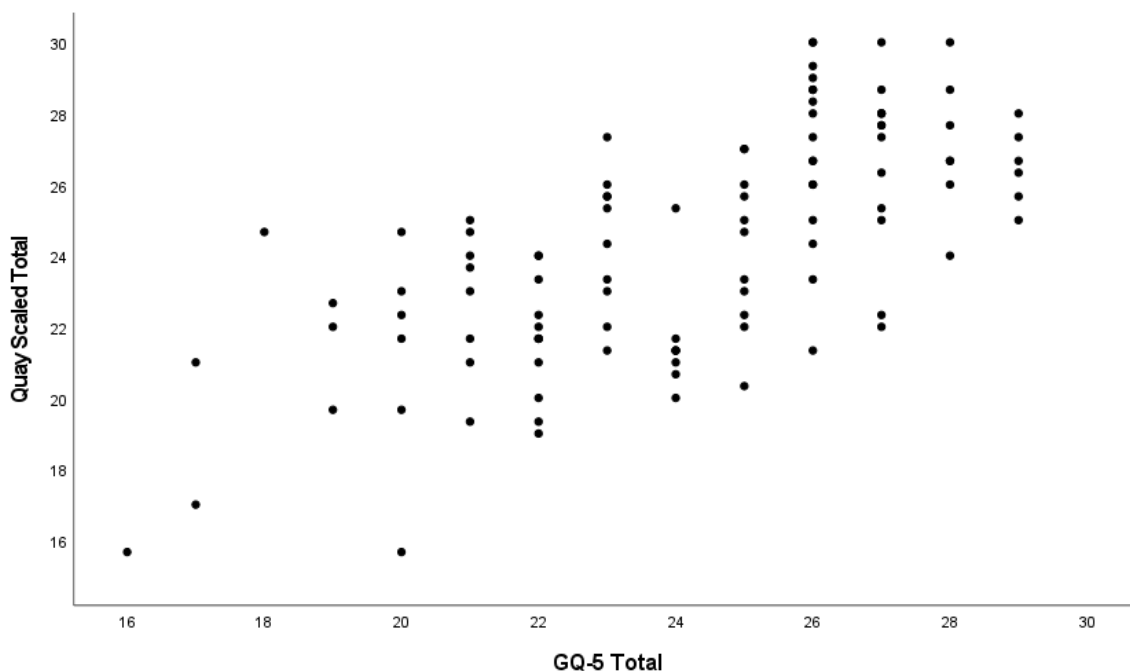
3.5.7 Group Comparisons

A factorial MANOVA was conducted to explore the effect of age and gender on children's QUAY subscale scores (Appendix T). There was no significant main effect of age or gender, and no significant age by gender interaction on the children's scores overall (Appendix U). However, there was a significant difference in girls' and boys' scores on the gratitude subscale ($F(1, 99) = 4.806$, $p = .031$, $\eta p2 = .046$), with girls scoring around one point higher on this subscale ($M_{girls} = 27.23$, $SD = 3.25$; $M_{boys} = 26.29$, $SD = 3.50$) (Appendix U).

3.5.8 Final Questionnaire

See Appendix V for a fully formatted version of the measure as it stands, accompanied by provisional scoring instructions, and an example of the instructions for use that could be included in any future published version of the measure. The final 11 items are presented in the same order as they were displayed during questionnaire validation, to minimise potential differences in psychometric properties because of grouping them differently. To account for the lack of reverse scored items in the final measure, a concentration check question was added after item 7 (*Let's check you are still reading carefully. How often do you visit the moon?*). It was intended that an answer other than *never* could help to identify children who had not read the items properly.

3.6   Discussion

The aim of this study was to develop and pilot a new self-report questionnaire, the QUAY, to measure children's gratitude. It was intended that the QUAY would be more accessible, sensitive, and comprehensive than existing measures, so that it could be used to evaluate the impact of gratitude interventions and to identify children who may benefit from them. EFA led to the development of an 11-item scale, with good internal consistency and a strong correlation with the GQ-5 and GQ-6. The items loaded onto three factors, which were positively correlated with one another. These subscales were termed *gratitude, sense of privilege* and *appreciation.* Each subscale showed at least moderate positive correlation with the GQ-5 and GQ-6, and internal consistency of α = .69 or above. Children's mean scaled scores on the full scale ranged from 15.67 to 30, from a possible 6 to 30, indicating a degree of positive skew and ceiling effects in the responses. Girls' scores on the *gratitude* scale were significantly greater than boys', and there were no other significant age or gender differences in children's overall or subscale scores.

The finding that QUAY items could be organised into separate *gratitude* and *appreciation* subscales is consistent with the consensus in the literature that gratitude can exist as both an other-focused emotion, and as a more general appreciation for the good things in life (Emmons et al., 2019; Peterson & Seligman, 2004; Rusk et al., 2015; Wood et al., 2010). These two elements of gratitude are represented in the majority of gratitude measures designed for adults, including the GRAT (Watkins et al., 2003), the AI (Adler & Fagley, 2005) and the GAC (McCullough et al., 2002). The fact that the *gratitude* and *appreciation* subscales were distinct but strongly and positively correlated mirrors Wood, Maltby, et al.'s (2008) finding that interpersonal gratitude and intrapersonal appreciation are related parts of a unitary personality trait. It made theoretical sense that the *gratitude* subscale showed the largest correlation with the GQ-5 and GQ-6, which is considered a measure of grateful affect (Froh, Fan, et al., 2011). The fact that the *appreciation* and *sense of privilege* scales were moderately related to the GQ-5 and GQ-6 bolsters' Wood, Maltby et al.'s findings that gratitude and other aspects of appreciative functioning are connected but not synonymous.

The *sense of privilege* scale has parallels with the *social comparison* and *'have' focus* themes addressed in the AI (Adler & Fagley, 2005), and the *lack of a sense of deprivation* subscale of the GRAT (Watkins et al., 2003). Watkins et al. found that feeling privileged was positively associated with feeling appreciative. The same was true in this study, where the *appreciation* and *sense of privilege* scales were moderately correlated. The fact that this aspect of gratitude was identified as a distinct factor in the QUAY may be reflective of the messages that children receive about knowing how lucky they are. Halberstadt et al. (2016) found that parents wanted their

children to be more appreciative of the sacrifices that others made to help them and to provide them with nice things. These parents felt that increasing their children's awareness of those in less fortunate situations was one way of helping them to recognise this. This concept appears closely related to the theme captured by the two items on the *sense of privilege* scale in the QUAY: *'I am so lucky compared to some other children'* and *'Other people give up their time to help me'.* Therefore, the range of scores on this scale may reflect the varying degree to which children in the present study have received and absorbed this message from the adults around them, as well as their actual degree of good fortune in life.

Although not all five domains or all 32 aspects of gratitude identified by Rusk et al. (2015) were clearly represented in the QUAY, at least one item that was written for each domain was included in the final 11 items. The *attention and awareness* and *emotions* domains were most strongly represented with three items from each, followed by *goals and habits* and *relationships and virtues* with two items each, and *comprehension and coping* with one item. This may be because some of the cognitive processes included in this domain are relatively abstract and therefore difficult to target with items using child-friendly language. For example, item 8 (*I can think about the things I am grateful for to cheer me up if I am feeling sad*) was written to capture the concept of *refocussing*, defined as "using gratefulness to combat negative emotions" (Rusk et al., 2015, p.5). On reflection, it is likely that an item such as this may be overly sophisticated for a child of eight years to enact or identify in themselves. However, it was notable that aspects of *comprehension and coping* were present in the measure, if not originally written under this domain heading. For instance, *sense of abundance* and *social comparison* appeared to be represented in the *sense of privilege* scale, highlighting the overlap between the themes in the different domains.

The aspects of gratitude covered by the QUAY did appear to fit neatly with descriptions of six to nine year old children's gratitude, as identified by their parents (Halberstadt et al., 2016). In Halberstadt et al.'s study, parents reported that their children could be grateful for what they have, what they have been given, and what exists. The three QUAY subscales seemed to mirror this pattern. The *gratitude* scale reflected thankful feelings for what children have, for example *'I feel happy to have the life I have'.* The *sense of privilege* scale tapped into what children had been given, for instance *'other people give up their time to help me'.* And the *appreciation* scale was aligned with gratitude for what exists, with items such as *'I look around and feel amazed by the things that I see'.* Halberstadt et al. also found that parents described cognitive, emotional, and behavioural demonstrations of their children's gratitude. These areas were also reflected in the domains identified by Rusk et al. (2015) and consequently they were present in the items on the QUAY. Grateful behaviour was measured by items such as *'If someone does a kind thing for me, I*

will do something kind back'. Grateful emotions were represented by items such as *'I feel happy if someone does a kind thing for me'.* Grateful cognitions were a feature in items like *'I think about good things that have happened to me in the past'.* This highlights the broader scope of the QUAY compared with the GQ-6, which primarily measures grateful affect (Froh, Fan, et al., 2011). The finding that girls reported slightly higher scores on the *gratitude* subscale than boys also appears to be consistent with other research finding that females are more likely to experience and express gratitude, and view it more positively as a construct (Kashdan et al., 2009).

Considering the psychometric properties of the QUAY, the internal consistency of the full scale was similar to that of existing measures of gratitude which have been validated with children. For the 105 eight to 10 year old participants in the present study, Cronbach's alpha for the 11 items was .86. By way of comparison, Froh et al. (2011) found that in 10 to 11 year olds, the GQ-6, the GAC and the GRAT had reliabilities of .81, .88 and .72 respectively. Interestingly, in the present study, the internal consistency of the new measure was greater than that of the GQ-6 in the same sample, whether item six was included or not (.72 without item 6 and .60 with item 6). Therefore, the new measure offers the advantage of being written in an accessible way for children, without compromising the ability of the items to measure the construct of gratitude collectively. It should be noted that the *appreciation* and *sense of privilege* subscales had fewer items and lower internal consistency coefficients (.71 and .69 respectively). Therefore, the items and structure of the factors are likely to require further exploration before having the sufficient psychometric quality to measure these more specific aspects of gratitude in children.

It was interesting to note that none of the reverse scored items in the QUAY showed a strong relationship to the other items. It might be that these items did not measure gratitude effectively because they did not accurately capture its opposite pole. The inverse of gratitude may not be feeling jealous of other children or taking longer to recover after a disappointment (as reflected in two of the discarded items), but simply experiencing gratitude less often or less intensely. Other research has identified a similar issue. For example, when validating the Penn State Worry Questionnaire with eight to 12 year old children, Muris et al. (2001) found that removing the three reverse scored items from the scale increased its psychometric quality. Similarly, Ebesutani et al. (2012) found that the nine negatively worded items in the Loneliness Questionnaire showed reduced ranges of scores, poorer discrimination properties, and weaker internal consistency relative to the non-reverse scored items. They argued that reverse scored items are less sensitive because they measure the construct in question indirectly by trying to tap into its opposite. Additionally, in the present study, a parent fed back that their child had found the negatively worded items more difficult to understand. Therefore, another advantage of the QUAY is that its positive wording may mean that the target construct of gratitude is measured

more directly. However, a drawback of having no reverse-scored items in the final measure is that it could be more difficult to detect whether children have maintained concentration throughout completion of the items. Consequently, a concentration check question was added to the final questionnaire.

Further exploration is needed into the distribution of children's responses on the QUAY. In the present sample, respondents did not utilise the full range of response options, most often neglecting to choose *never*. Therefore, the range of total scores on the QUAY was positively skewed. Additionally, several children's scores reached the ceiling of the measure. Children's scores on the GQ-5 and GQ-6 were also positively skewed in this study, suggesting that the skew on the QUAY may be related to a bias in the sample, rather than an issue with the new measure specifically. Possible reasons for positive bias in this sample include the fact that children were being supported by their parents and may have felt more pressure to give positive answers, and their awareness of the £10 Amazon voucher incentive, which could also have inflated their sense of gratitude at the time of completion. The issue may not be unique to the present study. Froh, Fan, et al. (2011) and Watkins et al. (2003) also observed positive skew when validating the GQ-6 with youth and the GRAT with adults respectively. As acknowledged by Watkins, this may be reflective of a general tendency for individuals to give more positive, perhaps socially desirable answers when completing measures of positive constructs. Nevertheless, the QUAY may be improved by adapting the available response options. To explore whether the word *never* felt too absolute for children, the *never* and *always* options could be replaced by *almost never* and *almost always*, or these options could be added between (*not*) *very often* and *never/always* to extend the number of response options and perhaps increase the sensitivity of the scale.

3.6.1 Strengths and Limitations

A strength of this study is that its outcome is the first self-report measure of gratitude designed specifically to be used with children. By directly eliciting the views of children in the target age range for the QUAY and using these to refine the wording of the items, the researcher aimed to overcome issues with previous measures where the language of some items is unsuitable for children. Another strength is that the initial item pool was developed using the existing literature to identify multiple facets of gratitude. Although the scales derived through EFA do not include all these elements, the process of including them has allowed a wider range of concepts to be presented to children and included in the analysis. It has helped to identify aspects of gratitude which appear to be common and more easily measured in children, as well as those which have been identified in the literature but did not appear in the subscales identified. The latter may not have emerged for a number of reasons, including because these aspects are not

present in the target age range or because the items that were developed were not a valid measure of those constructs.

Several related limitations of the study emerged, partly because the research took place during a global pandemic. Data collection was originally due to take place in schools using an opt out consent procedure. However, due to school closures and the demands on education settings at the time of data collection, this was not possible. Instead, data was collected via an online survey, which was advertised to parents who were asked to support their children to complete the questionnaires at home. Card (2019) found no significant difference in adolescents' and adults' scores on gratitude measures when they were completed online or on paper. However, the online nature of the study meant that the researcher had less control over and insight into the conditions under which the questionnaire was completed, for instance, the amount of input parents and guardians had with respect to their children's answers. The offer of an Amazon voucher incentive over one period of data collection may have also increased the risk that respondents outside of the target age range might participate to gain a voucher.

Another issue was that this method likely contributed to reduced response rates. Collecting data in schools would have allowed the collection of substantial proportions of the data in the space of one visit. Therefore, the sample size the researcher was able to reach in the time available was lower than is typically considered appropriate for EFA. Based on recommendations from various authors, Carpenter (2018) advises that, following a pilot test with 50 to 100 participants, five participants per item is generally the minimum sample size appropriate for EFA. Based on the initial 27 items, the study required at least 135 participants to meet this threshold. The actual sample size of 107 means that the QUAY factors could be considered less stable and therefore less generalisable (Carpenter, 2018).

Additionally, the scope and quality of the research could be extended with the addition of further rounds of analysis to conduct a confirmatory factor analysis on the structure of the QUAY. Subsequent validation of the questionnaire in a larger sample should include children of a wider range of ages, so that the developmental nature of the measure could be explored. It would also be highly beneficial to test the measure in a more diverse sample in terms of socioeconomic status and cultural background. Given that two of the subscales were comprised of relatively few items, it would also be interesting to trial further items written to address the specific constructs of *appreciation* and *sense of privilege*, to assess whether the reliability of those scales could be improved with additional items. A measure of discriminant validity could also be added, to further evaluate the construct validity of the new tool.

Finally, it should be noted that the QUAY items were written around a literature synthesis which only included research and existing measures written in English (Rusk et al., 2015). Furthermore, the present research was advertised in English, predominantly via schools and online parent groups which were based in the South of England. Therefore, it is highly likely that most of the children who were involved in testing out the measure were English speaking and living in a Western country. Therefore, without validation in a range of cultural contexts, the QUAY should not be considered to have cultural equivalence for measuring gratitude in children living in other cultural contexts (Song et al., 2015). These are all issues that further research could usefully address.

3.6.2 Implications

This research provides initial support for the use of a new self-report tool for measuring children's gratitude, which offers good internal consistency, convergent validity, and accessible language. It highlights that gratitude in children can be measured in a similar way to that in adults, with some notable limitations. These include the need to consider the effect of reverse-scored items and the potential for positively skewed responses and ceiling effects. This study also sheds light on the potentially salient features of gratitude in children. Consistent with previous research, children's gratitude appears to have behavioural, emotional, and cognitive dimensions. As is the case in adults, it seems to be felt both interpersonally and intrapersonally. Additionally, a sense of one's good fortune in life appeared to be a distinct construct in children, which may be the result of the messages received from adults about the importance of downward social comparison in recognising what you have. Consequently, the newly developed QUAY offers education practitioners and researchers an evidence-informed tool for measuring children's gratitude in order to evaluate the impact of gratitude interventions and to identify children who may benefit from such an approach, with scope to revise and improve the measure over time.

Appendix A   Author Guidelines for Identified Journals

Systematic review- Journal of Happiness Studies

(Springer) https://www.springer.com/journal/10902

-Word count 5000-10000, average 7500

-"The peer-reviewed Journal of Happiness Studies is devoted to scientific understanding of subjective well-being. Coverage includes both cognitive evaluations of life such as life-satisfaction, and affective enjoyment of life, such as mood level."

-Have published similar reviews, e.g.

-Gratitude Interventions: Effective Self-help? A Meta-analysis of the Impact on Symptoms of Depression and Anxiety

-The Efficacy of Multi-component Positive Psychology Interventions: A Systematic Review and Meta-analysis of Randomized Controlled Trials

-A Systematic Review of the Relationship Between Physical Activity and Happiness

Empirical paper- Journal of Positive Psychology

(Routledge) https://www.tandfonline.com/toc/rpos20/current

-Word count 7500

-"Special emphasis is placed on new theoretical and methodological approaches that advance both the science and practice of positive psychology."

-Published similar papers, e.g.

-Measuring Gratitude in Children

-Meta-analyses of the reliabilities of four measures of gratitude

-Measuring Gratitude at Work

Appendix B   Search Strategy

Database	Search terms	Limiters
PsychINFO	gratitude OR grateful* OR thankful* AND mediat* OR mechanism*	Search full text
ERIC	gratitude OR grateful* OR thankful* AND mediat* OR mechanism*	Search anywhere
Web of Science	gratitude OR grateful* OR thankful* AND mediat* OR mechanism*	Search topic (= title, abstract, author, keywords, keywords plus) Because 'all fields' includes acknowledgements, e.g. 'we are grateful to', returning hundreds of thousands of results

Appendix C   Reasons for Exclusion in Full Text Screening

1. No full-text access (n = 31)

2. Full text is not published or available in English (n = 3)

3. Article is not about gratitude (n = 3)

4. Article is not an empirical paper using original, quantitative data (n = 15)

5. Article is about business/selling/customers/consumers (n = 9)

6. Study does not include a distinct group of participants who are all aged 25 years and under, or the age range is not stated (unless implied by the setting, e.g. secondary school students) (n = 122)

7. Study does not include a quantitative analysis of at least one mediating variable in the relationship between a gratitude predictor variable and a well-being/ life satisfaction outcome (n = 119)

8. Study uses one person's gratitude to another person as a predictor of that other person's well-being/ positive outcome (n = 4)

9. Gratitude is not measured as a single variable, or is part of a multi-faceted intervention (n = 0)

Appendix D   Data Extraction Table of Included Study Characteristics

Study	Theories [a]	Participants						Design[d]	Analysis [e]	Relevant measures			Control
		N	Age[b]	Gender [c]	Ethnicity	Setting	Country			Predictor(s)	Mediator(s)	Outcome(s)	
Armenta, Fritz, Walsh & Lyubomirsky (2020) Original thesis- Armenta (2017)	B&B	N = 964 Grat: n = 732 Ctrl: n = 232	13 - 18 M = 15.11	F = 51%	White: 40.9% Hispanic: 18.4% Asian: 14.6% Black, Hawaiian, or Native American: <1% Multiple/ other: 15%	High schools	USA	EXP, LT Post-test: 4 weeks Follow-up: 3 months	REG (Hayes), BCI, MF	Expressing gratitude condition (Control = 0, Gratitude = 1) Gratitude Manipulation check (Gratitude Questionnaire Six-Item Form [GQ-6], McCullough, Emmons, and Tsang, 2002)	Elevation (single item rating scale) Connectedness (Balanced Measure of Psychological Needs, Sheldon & Hilpert, 2012, modified) Indebtedness (single item rating scale) Negative affect (Affect-Adjective Scale, Diener & Emmons, 1985) Humility (Brief State Humility Scale (Kruse, Chancellor, & Lyubomirsky, 2017)	Life satisfaction (Brief Multidimensional Students' Life Satisfaction Scale, Seligson, Huebner, & Valois, 2003)	Life satisfaction at time 1
Caleon, Ilham, Ong & Tan (2019)	B&B	N = 190	13 - 16 13: 8% 14-15: 85% 16: 7%	M = 57% F = 43%	Chinese: 50% Malay: 34% Indian: 7% Other: 9%	Secondary schools	Singapore	OBS, CS	REG (Hayes), BCI	Trait gratitude (GQ-6, McCullough et al., 2002)	Positive relationships (Relatedness with key social partners, Furrer and Skinner, 2003) School resilience (16-item School Resilience Scale, Caleon & King, forthcoming)	School life satisfaction (Multidimensional Student Life Satisfaction Scale, Gilman et al., 2000)	-
Chen (2013)	SDT	N = 291	15 - 19 M = 16.81 (0.88)	M = 192 F = 99	Not reported (Mandarin speaking)	High school sports teams	Taiwan	OBS, CS	SEM, MF, indirect effect test in Mplus 5	Trait gratitude (GQ-6 - Taiwan Version, Chen & Kee, 2008)	Perceived coach support, Perceived teammate support and Social support (Student–Athlete Perceived Social	Life satisfaction (Satisfaction with Life Scale, Diener et al. 1985)	-

Study	Theories [a]	Participants						Design[d]	Analysis [e]	Relevant measures			Control
		N	Age[b]	Gender [c]	Ethnicity	Setting	Country			Predictor(s)	Mediator(s)	Outcome(s)	
											Support Scale, Pan, 2008) Team satisfaction (Team Satisfaction Scale, Walling et al., 1993)		
Chen, Kee & Chen (2015)	B&B CoR	N = 300	M = 16.8 (0.88)	M = 197 F = 103	Not reported	High school sports teams	Taiwan	OBS, CS	SEM, MF	Dispositional gratitude (GQ-6 - Taiwan Version, Chen & Kee, 2008)	Perceived Team Cohesion (Group Cohesion Evaluation Questionnaire, Glass and Benshoff, 2002)	Life satisfaction (Satisfaction with Life Scale, Diener et al. 1985)	-
Datu & Mateo (2015)	SPRT	N = 409	17 - 21 M = 17.63 (1.12)	F = 236	Filipino	University	Philippines	OBS, CS	REG (Baron & Kenny), Sobel test	Gratitude (Gratitude Questionnaire Six-Item Form, McCullough, Emmons, and Tsang, 2002)	Presence of meaning and Search for meaning (Meaning in Life Questionnaire, Steger et al., 2006)	Life satisfaction (Satisfaction with Life Scale, Diener, Emmons, Larsen, and Griffin, 1985)	-
Froh, Yurkewicz & Kashdan (2009)	B&B MAT	N = 154	11 - 13 M = 12.14 (0.67)	M = 53.9%	Caucasian: 79.9%	Middle school	USA	OBS, CS	REG (Baron & Kenny), Sobel test	Gratitude (Gratitude Adjective Checklist, McCullough et al., 2002)	Positive affect and Negative affect (rating affect adjectives) Gratitude in response to aid (rating adjectives) Physical symptoms (ticking symptoms) Prosocial behaviour (yes/ no questions) Social support (rating 2 items)	Life satisfaction (rating scales and Brief Multidimensional Students' Life Satisfaction Scale, Seligson, Huebner, & Valois, 2003) Positive affect (rating affect adjectives)	Positive affect
Jiang, Sun, Liu & Pan (2016)	SDT	N = 764	18 - 23 M = 19.5	M = 34% F = 60% DNR = 6%	Not reported	Colleges	China	OBS, CS	SEM, BCI, MF	Gratitude (GQ-6, McCullough et al. 2002)	Materialism (Material Values Scale, Li and Guo, 2009)	School well-being (School Life Satisfaction Questionnaire for Adolescents, Tao et al. 2005 and Positive and negative affect in school subscales of ASW-BS, Tian et al. 2013)	-

Appendix D

Study	Theories [a]	Participants						Design [d]	Analysis [e]	Relevant measures			Control
		N	Age [b]	Gender [c]	Ethnicity	Setting	Country			Predictor(s)	Mediator(s)	Outcome(s)	
Kong, Yang, Yan & Li (2020)	B&B	N = 1445	14 - 16 M = 15.03 (1.95)	M = 630 F = 814 DNR = 1	Not reported	High schools	China	OBS, CS	SEM, BCI, MF	Trait gratitude (GQ-6, McCullough et al. 2002)	Resilience (The Connor–Davidson Resilience Scale, Campbell-Sills & Stein, 2007) Social support (Multi-dimensional Scale of Perceived Social Support, Zimet et al., 1990)	Subjective well-being: Life satisfaction (Satisfaction with Life Scale, Diener et al. 1985) and Affect (Positive and Negative Affect Schedule, Watson et al., 1988)	-
Lin (2016)	B&B	N = 750	18 - 22 M = 20.31 (1.07)	M = 264 F = 486	Not reported	University	Taiwan	OBS, CS	SEM, BCI, MF	Gratitude (Inventory of Undergraduates' Gratitude, Lin & Yeh, 2011)	Social support (Inventory of Social Support, Lin, 2011) Coping Style (Inventory of Coping Style [ICS]; Lin, 2011)	Well-being (Inventory of Well-being, Lin, 2011)	-
Oriol, Miranda, Bazan & Benavente (2020) (Study 3)	B&B SDT	N = 371	M = 14.12 (1.78)	F= 48.8%	Not reported	Secondary school rural training centre	Peru	OBS, CS	SEM, MF	Optimism (Optimism scale of the Middle Years Development Instrument, Schonert-Reichl et al., 2013)	Gratitude (Scale adapted from Gratitude Questionnaire for youth, Froh et al., 2011) Meaning in life (Scale based on Steger et al., 2006)	Life satisfaction (Five item scale developed by Gadermann et al., 2010)	-
Sun, Jiang, Chu & Qian (2014)	B&B MAT	N = 782	18 - 23 M = 20.95 (1.30)	M = 321 F = 461	Chinese	Colleges	China	OBS, CS	SEM, BCI, MF	Gratitude (GQ-6, McCullough et al., 2002)	Interpersonal relationship disturbance (Interpersonal Relationship Integrated Diagnosis Questionnaire, Zheng, 1999) Social support (Multidimensional Scale of Perceived Social Support, Zimet, Dahlem, Zimet, & Farley, 1988)	School well-being (School Life Satisfaction Questionnaire for Adolescents, Tao, Sun, Feng, Su, & Zhu, 2006 and positive affect and negative affect in school subscales of the Adolescents' School Well-Being Scale, Tian et al., 2013)	-

Study	Theories [a]	Participants						Design[d]	Analysis [e]	Relevant measures			Control
		N	Age[b]	Gender [c]	Ethnicity	Setting	Country			Predictor(s)	Mediator(s)	Outcome(s)	
Tian, Du & Huebner (2015)	MAT	N = 706	8 - 14 M = 11.07 (1.07)	M = 375 F = 331	Not reported	Elementary schools	China	OBS, CS	REG (Baron & Kenny)	Gratitude (Gratitude Questionnaire, McCullough et al. 2002)	Prosocial behaviour (Prosocial Dimension adapted from the Mental Health Scale for Primary and Secondary School Students, Zhang et al. 2004)	School satisfaction and Positive affect in school (Elementary School Students' Subjective Well Being in School Scale, Liu et al., 2014)	Gender
Tian, Pi, Huebner & Du (2016)	BPN	N = 881	11 - 15 M = 12.97 (0.67)	M = 427	Chinese	Public schools	China	OBS, CS	SEM, BCI, MF	Gratitude (GQ-6, McCullough et al., 2002)	Competence, Autonomy and Relatedness need satisfaction (Adolescent Students' Basic Psychological Needs at School Scale, Tian et al., 2014)	Subjective well-being in school (Brief Adolescent's Subjective Well-Being in School Scale, Tian et al., 2015)	-
Tian, Chu & Huebner (2016)	B&B	N = 324	9 - 13 M = 11.39 (1.07)	M = 176	Not reported	Elementary schools	China	OBS, CS	SEM, BCI, MF	Gratitude (GQ-6, McCullough et al. 2002)	Prosocial behaviour (Primary School Upper Grade Students' Prosocial Behaviors Questionnaire, Li 2009) Positive affect in school and Negative affect in school (School Students' Subjective Well Being in School Scale, Liu et al., 2014)	School satisfaction (School Students' Subjective Well Being in School Scale, Liu et al., 2014)	-
Tsang, Carpenter, Roberts, Frisch & Carlisle (2014)	SDT	N = 246	18 - 25 M = 21	F = 129	Caucasian: 75% Hispanic: 8% Asian: 5% African American: 5%	University subject pool	USA	OBS, CS	REG (Hayes), BCI	Materialism (15-item version of Materialism Scale, Richins & Dawson, 1992)	Dispositional gratitude (Gratitude Questionnaire-6, McCullough et al. 2002) Need satisfaction (Balanced Measure of Psychological	Life satisfaction (Satisfaction with Life Scale, Diener, Emmons, Larsen, & Griffin, 1985)	-

| Study | Theories [a] | Participants | | | | | | Design[d] | Analysis [e] | Relevant measures | | | Control |
		N	Age[b]	Gender [c]	Ethnicity	Setting	Country			Predictor(s)	Mediator(s)	Outcome(s)	
					Mixed race: 5% Other: 1%						Needs, Sheldon & Hilpert, 2012)		
Wood, Joseph & Linley (2007) (Sample 1)	B&B	N = 149	18 - 22	M = 33 F = 115 DNR = 1	White: 92%	University	UK	OBS, CS	REG (Baron & Kenney), Sobel test	Gratitude (GQ-6, McCullough et al., 2002)	Coping (Brief COPE, Carver, 1997)	Life satisfaction (Satisfaction with Life Scale, Pavot & Diener, 1993) Happiness (Short Depression – Happiness Scale, Joseph, Linley, Harwood, Lewis, & McCollam, 2004)	-
You, Lee, Lee & Kim (2018)	B&B CoR	N = 877	10 - 12 M = 11.01 (0.82)	M = 50.2% F = 49%	Not reported	Middle schools	South Korea	OBS, CS	SEM, BCI, MF	Gratitude (GQ-6: McCullough et al., 2002)	Social support (3 items from the Social and Emotional Health Survey, Furlong, You, Renshaw, Smith, & O'Malley, 2014) Emotional difficulties (10 items from Me & My School Emotional difficulties subscale, Deighton et al., 2013)	Life satisfaction (Student life satisfaction survey, Huebner, 1991)	-
Zhou, Zhen & Wu (2019)	B&B	N = 397	13 - 20 M = 16.42 (1.76)	M = 61% F = 38.8% DNR = 0.2%	Not reported	Middle schools	China	OBS, CS	SEM, BCI, MF	Gratitude (Modified version of the GQ-6, Zhou & Wu, 2016)	Social support (Modified version of the social net questionnaire, Zhou & Wu, 2016) Self-esteem (10 item Self-esteem Scale, Rosenberg, 1989) State hope (State Hope Scale, Snyder et al. 1996)	Life satisfaction (Satisfaction with Life Scale, Diener et al. 1985)	Trauma severity (Trauma exposure questionn aire, Zhou et al. 2017)

[a] Theories: B&B = broaden and build, SDT = self-determination theory, CoR = conservation of resources, SPNT = social and psychological needs theory, MAT = moral affect theory, BPN = basic psychological needs.

[b] Age: In years, standard deviations are in parentheses.

c Gender: M = males, F = females, DNR = did not report.

d Design: EXP = experimental, LT = longitudinal, OBS = observational, CS = cross sectional.

e Analysis: REG = regression analysis, SEM = structural equation modelling, BCI = bootstrap confidence intervals, MF = model fit.

Appendix E   Data Extraction Table of Included Study Findings

Study	Model/ pathway	Predictor → Mediator (a)	Mediator → Outcome (b)	Direct effects Predictor → Outcome (c')	Indirect effects (ab)	Total effects (c)	Additional paths	Significant mediation	Fit indices for best/ final model [a]
Armenta, Fritz, Walsh & Lyubomirsky (2020)	Expressing gratitude condition → Elevation (T1-T4) → Life satisfaction T5	b = 0.78, SE = 0.08, t = 9.70, p < .001, 95% CI [0.62, 0.94]	b = 0.23, SE = 0.03, t = 8.34, p < .001, 95% CI [0.18, 0.28]	b = − 0.03, SE = 0.06, t = − 0.43, p = .67, 95% CI [−0.15, 0.10]	Estimate = .18, 95% CI [0.12, 0.24]	b = 0.15, p < .05		Y	
	Expressing gratitude condition → Elevation (T1-T4) → Life satisfaction T6	b = 0.85, SE = 0.09, t = 9.15, p < .001, 95% CI [0.66, 1.03]	b = 0.18, SE = 0.03, t = 5.55, p < .001, 95% CI [0.11, 0.24]	b = − 0.01, SE = 0.07, t = − 0.17, p = .87, 95% CI [− 0.16, 0.13]	Estimate = .15, 95% CI [0.09, 0.22]	b = 0.11, p = .13		Y	
	Expressing gratitude condition → Connectedness (T1-T4) → Life satisfaction T5	b = 0.50, SE = 0.07, t = 6.82, p < .001, 95% CI [0.35, 0.64]	b = 0.34, SE = 0.03, t = 11.43, p < .001, 95% CI [0.28, 0.39]	b = − 0.01, SE = 0.06, t = − 0.24, p = .81, 95% CI [− 0.13, 0.10]	Estimate = .17, 95% CI [0.11, 0.23]	b = 0.15, p < .05		Y	
	Expressing gratitude condition → Connectedness (T1-T4) → Life satisfaction T6	b = 0.47, SE = 0.08, t = 5.50, p < .001, 95% CI [0.30, 0.63]	b = 0.24, SE = 0.03, t = 6.85, p < .001, 95% CI [0.17, 0.30]	b = 0.03, SE = 0.07, t = 0.38, p = .71, 95% CI [− 0.11, 0.16]	Estimate = .11, 95% CI [0.06, 0.16]	b = 0.11, p < .05		Y	
	Expressing gratitude condition → Indebtedness (T1-T4) → Life satisfaction T5	b = 0.72, SE = 0.08, t = 8.55, p < .001, 95% CI [0.55, 0.88]	b = 0.11, SE = 0.03, t = 3.93, p < .001, 95% CI [0.05, 0.16]	b = 0.08, SE = 0.06, t = 1.17, p = .24, 95% CI [− 0.05, 0.20]	Estimate = .08, 95% CI [0.04, 0.12]	b = 0.15, p < .05		Y	
	Expressing gratitude condition → Indebtedness (T1-T4) → Life satisfaction T6	b = 0.88, SE = 0.10, t = 9.17, p < .001, 95% CI [0.69, 1.06]	b = 0.11, SE = 0.03, t = 3.42, p < .001, 95% CI [0.05, 0.17]	b = 0.04, SE = 0.08, t = 0.58, p = .56, 95% CI [-0.10 0.19]	Estimate = .09, 95% CI [0.04, 0.16]	b = 0.11, p < .05		Y	
	Expressing gratitude condition → Negative affect (T1-T4) → Life satisfaction T5	b = 0.18, SE = 0.07, t = 2.52, p = .01, 95% CI [0.04, 0.33]	b = 0.23, SE = 0.03, t = 7.47, p < .0001, 95% CI [0.17, 0.29]	b = 0.11, SE = 0.06, t = 1.84, p = .07, 95% CI [− 0.01, 0.23]	Estimate = .04, 95% CI [0.01, 0.08]	b = 0.15, p < .05		Y	
	Expressing gratitude condition → Negative affect (T1-T4) → Life satisfaction T6	b = 0.16, SE = 0.08, t = 1.96, p = .051, 95% CI [− 0.001, 0.33]	b = 0.17, SE = 0.04, t = 4.72, p < .0001, 95% CI [0.10, 0.24]	b = 0.11, SE = 0.07, t = 1.58, p = .11, 95% CI [− 0.03, 0.25]	Estimate = .03, 95% CI [− 0.001, 0.07]	b = 0.11, p < .05		N	
	Expressing gratitude condition → Humility (T1-T4) → Life satisfaction T5	Not reported	Not reported	Not reported	Estimate = .01, 95% CI [− .01, .02]	Not reported		N	

Study	Model/ pathway	Predictor → Mediator (a)	Mediator → Outcome (b)	Direct effects Predictor → Outcome (c')	Indirect effects (ab)	Total effects (c)	Additional paths	Significant mediation	Fit indices for best/ final model [a]
	Expressing gratitude condition → Humility (T1-T4) → Life satisfaction T6	Not reported	Not reported	Not reported	*Estimate* = .001, 95% CI [-.01, .02]	Not reported		N	
Caleon, Ilham, Ong & Tan (2019)	Trait gratitude → Relatedness → School resilience → School life satisfaction (sequential model)			*b* = .27, *SE* = .06, *t* = 4.74, p <.001, 95% CI [0.156, 0.378]	*Indirect effect* = 0.023, *SE* = 0.013, 95% CI [0.002, 0.052]	*b* = .51, *SE* = .05, *t* = 10.13, *p* < .001, 95% CI [0.410, 0.609]		Y	Overall model *F* (3186) = 59.97, *p* < .001, *R²* = .49
	Trait gratitude → Relatedness → School life satisfaction (pathway)	*b* = .46, *p* < .001	*b* = .38, *SE* = .07, *t* = 5.60, *p* < .001, 95% CI [0.246, 0.513]		*Indirect effect* = 0.18, *SE* =.05, 95% CI [0.097, 0.259]			Y	
	Trait gratitude → School resilience → School life satisfaction (pathway)	*b* = .35, *p* < .001	*b* = .13, *SE* = .04, *t* = 2.82, *p* < .001, 95% CI [0.038, 0.213]		*Indirect effect* = 0.045, *SE* = 0.03, 95% CI [0.005, 0.104]			Y	
	Relatedness → School resilience (pathway)						*b* = .39, *p* < .001		
Tsang, Carpenter, Roberts, Frisch & Carlisle (2014)	Materialism → Dispositional gratitude → Need satisfaction → Life satisfaction (model)	β = − .32, *p* < .001	β = .30, *p* < .001	β = − .12, *p* = .048, 95% CI [− .19, − .06]	*Estimate* = − .04, 95% CI [− .08, − .02], *R²* = .50	β = − .24, *p* < .001		Y	Overall model *R²* = .21
	Materialism → Gratitude → Life satisfaction (pathway)	β = − .32, *p* < .001	β = .17, *p* = .01		*Estimate* = − .05, 95% CI [− .11, − .01]			Y	
	Materialism → Need satisfaction → Life satisfaction (pathway)	β = − .08, *p* = .17	β = .30, *p* < .001		*Estimate* = − .02, 95% CI [− .08, .01]			N	
	Gratitude → Need satisfaction (pathway)						β = .45, *p* < .001		
Datu & Mateo (2015)	Gratitude → Presence of meaning → Life satisfaction	*b* = .39, β = .48, *SE* = .06, *p* < .01, *R²* = .15	*b* = .45, β = .56, *SE* = .04, *p* < .01, *R²* = .44	*b* = .34, β = .42, *SE* = .04, *p* < .01	*Sobel test: z* = 5.09, *p* < .01	*b* = .52, β = .64, *SE* = .06, *p* < .01, *R²* = .26		Y	
	Gratitude → Search for meaning → Life satisfaction	Not reported	Not reported	Not reported	Not reported	Not reported		N	
Froh, Yurkewicz & Kashdan (2009)	Gratitude → Potential mediators → Life satisfaction	Not reported	Not reported	*r = .37, p < .004*	Not reported	Not reported		N	
		Not reported	Not reported	*r = .67, p < .004*	Not reported	Not reported			

Study	Model/ pathway	Predictor → Mediator (a)	Mediator → Outcome (b)	Direct effects Predictor → Outcome (c')	Indirect effects (ab)	Total effects (c)	Additional paths	Significant mediation	Fit indices for best/ final model [a]
	Gratitude → Potential mediators → Positive affect Potential mediators: Positive affect, Negative affect, Gratitude in response to aid, Physical symptoms, Prosocial behaviour, Social support								
Tian, Du & Huebner (2015)	Gratitude → Prosocial behaviour → School satisfaction	b = 2.50, SE = 0.34, β = 0.27, p < 0.001	b = 0.06, SE = 0.004, β = 0.54, p < 0.001	b = 0.32, SE = 0.04, β = 0.29, p < 0.001	$Indirect\ effect$ = 0.12, R^2 = 0.2927,	b = 0.45, SE = 0.04, β = 0.41, p < 0.001		Y	
	Gratitude → Prosocial behaviour → Positive affect in school	b = 2.47, SE = 0.34, β = 0.27, p < 0.001	b = 0.06, SE = 0.005, β = 0.40, p < 0.001	b = 0.28, SE = 0.05, β = 0.21, p < 0.001	$Indirect\ effect$ = 0.10, R^2 = 0.3226	b = 0.41, SE = 0.05, β = 0.31, p < 0.001		Y	
	Gender → School satisfaction						β = 0.17, p < 0.001		
Wood, Joseph & Linley (2007)	Gratitude → Self-blame → Life satisfaction	Not reported	Not reported	r = .59, p < .001	$Indirect\ effect$: z = 2.45, p < .05, 11% mediation	Not reported		Y	
Sample 1 only	Gratitude → Positive reinterpretation and growth or Behavioural inhibition → Life satisfaction	Not reported	Not reported		Not reported	Not reported		N	
	Gratitude → Coping styles → Happiness	Not reported	Not reported	r = .57, p < .001	Not reported	Not reported		N	
Chen (2013)	Trait gratitude → Perceived coach support and Perceived teammate support (parallel) → Team satisfaction → Life satisfaction (sequential model)							Y	Measurement model: SB-χ^2 = 1394.0, df = 840; CFI = 0.93; TLI = 0.93; $RMSEA$ = 0.048; $SRMR$ = 0.067
	Trait gratitude → Perceived coach support → Team satisfaction (pathway)	β = 0.51, p < .01	β = 0.39, p < .01	β = 0.17, p < .01	β = .20, p < .01				Structural model: SB-χ^2 = 1425.36, df = 844; CFI = 0.93; TLI =

Study	Model/ pathway	Predictor → Mediator (a)	Mediator → Outcome (b)	Direct effects Predictor → Outcome (c')	Indirect effects (ab)	Total effects (c)	Additional paths	Significant mediation	Fit indices for best/ final model [a]
	Perceived coach support → Team satisfaction → Life satisfaction (pathway)	β = 0.39, *p* < .01	β = .62, *p* < .01		β = 0.24, p < .01			Y	0.93; *RMSEA* = 0.049; *SRMR* = 0.10
	Trait gratitude → Perceived teammate support → Team satisfaction (pathway)	β = 0.50, *p* < .01	β = 0.40, *p* < .01		β = .20, *p* < .01			Y	
	Perceived teammate support → Team satisfaction → Life satisfaction (pathway)	β = 0.40, *p* < .01	β = .62, *p* < .01		β = 0.25, *p* < .01			Y	
Chen, Kee & Chẹn (2015)	Dispositional gratitude → Perceived team cohesion → Life satisfaction	β = .51, *p* < .01	β = .17, *p* < .01	β = .32, *p* < .01				Y	Measurement model: χ² = 378.07, *df* = 149; *NNFI* = .97; *CFI* = .97; *SRMR* = .043; *RMSEA* = .072; *AIC* = 460.07 Structural model: χ² = 195.00, *df* = 101; *NNFI* = .97; *CFI* = .98; *SRMR* = .04; *RMSEA* = .056; *AIC* = 265.00
Jiang, Sun, Liu & Pan (2016)	Gratitude → Materialism → School well-being	β = − .28, *p* < .001, 95% CI [− .41, − .17]	β = − .27, *p* < .001, 95% CI [− .39, − .14]	β = .42, *p* < .001, 95% CI [.25, .59]	*Indirect effect* = .08, 95% CI [.06, .11], *p* < .05, *R²* = .506			Y	Measurement model: χ² (24, *N* = 764) = 144.21, *p* < .001; *RMSEA* = .080; *SRMR* = .063; *GFI* = .95; *CFI* = .90 Structural model: χ² (24, *N* = 764) = 144.21, *p* < .001; *RMSEA* = .080; *SRMR* = .061; *GFI* = .96; *CFI* = .90
Kong, Yang, Yan & Li (2020)	Trait gratitude → Resilience → Subjective well-being (single)				*Indirect effect* = .12, 95% CI [0.074, 0.174]			Y	Measurement model: χ2 = 185.24, *df* = 48, *p* < .001,

Appendix E

Study	Model/ pathway	Predictor → Mediator (a)	Mediator → Outcome (b)	Direct effects Predictor → Outcome (c')	Indirect effects (ab)	Total effects (c)	Additional paths	Significant mediation	Fit indices for best/ final model [a]
	Trait gratitude → Social support → Subjective well-being (single)				*Indirect effect* = .22, 95% CI [0.186, 0.294]			Y	*RMSEA* = 0.044; *SRMR* = 0.035; *CFI* = 0.98; *GFI* = 0.98; *NFI* = 0.97
	Trait gratitude → Resilience and Social support (parallel and allowed to co-vary) → Subjective well-being (model)			β = .11					Structural model: χ2 = 184.93, *df* = 48, *p* < 0.001; *RMSEA* = 0.044; *SRMR* = 0.035; *CFI* = 0.98; *GFI* = 0.98; *NFI* = 0.97
	Trait gratitude → Resilience → Subjective well-being (pathway)	β = .17	β = .58		95% CI [0.082, 0.158]			Y	
	Gratitude → Social support → Subjective well-being (pathway)	β = .37	β = .39		95% CI [0.127, 0.216]			Y	
	Social support ←→ Resilience (pathway)						β = .40		
Lin (2016)	Gratitude → Social support and Coping style (parallel) → Well-being (model)			β = .43, *SE* = .06, *p* < .001				Y	Measurement model: χ² (38, *N* = 750) = 305.05; *RMSEA* = .097; *SRMR* = .038; *GFI* = .93; *CFI* = .95
	Gratitude → Social support → Well-being (pathway)	β = .60, *p* < .05	β = .21, *p* < .05	β = .43, *SE* = .06, *p* < .001	β = .13, 95% CI [.07, .21]			Y	
	Gratitude → Coping style → Well-being (pathway)	β = .59, *p* < .05	β = .30, *p* < .05	β = .43, *SE* = .06, *p* < .001	β = .19, 95% CI [.11, .29]			Y	Structural model: χ2 (38, *N* = 750) = 305.048; *RMSEA* = .097; *SRMR* = .037; *GFI* = .93; *CFI* = .95
	Gratitude → Social support → Coping style (pathway)	β = .60, *p* < .05	B = .14, *SE* = .03, *p* < .01	β = .30, *p* < .05	β = .07, 95% CI [.02, .13]			Y	
	Social support → Coping Style → Well-being (pathway)	β = .14, *SE* = .03, *p* < .01	β = .30, *p* < .05	β = .21, *p* < .05	β = .04, 95% CI [.01, .08]			Y	
Oriol, Miranda, Bazan & Benavente (2020) (Study 3)	Optimism → Gratitude → Meaning in life → Life satisfaction (serial multiple mediation model)			β = .26		β = .44			Measurement model: χ2 = 361.09, χ2 /g.l. = 9.32; *TLI* = 0.92, *CFI* = 0.92, *SRMR* = 0.05
	Optimism → Gratitude (pathway)	β = 0.81, *p* < 0.05							Structural model: χ2 = 360.85, χ2 /g.l. =

Study	Model/ pathway	Predictor → Mediator (a)	Mediator → Outcome (b)	Direct effects Predictor → Outcome (c')	Indirect effects (ab)	Total effects (c)	Additional paths	Significant mediation	Fit indices for best/ final model [a]
	Gratitude → Meaning in life → Life satisfaction (pathway)	β = 0.80, *p* < 0.05	β = 0.27, *p* < 0.05		β = 0.21, *p* < 0.05, R^2 = .23			Y	10.10; *TLI* = 0.91, *CFI* = 0.91, *SRMR* = 0.05
Sun, Jiang, Chu & Qian (2014)	Gratitude → Interpersonal relationship disturbance and Perceived social support (parallel) → School well-being (model)			β = 0.44, *p* < .001	β = .04, *p* < .05, 95% CI [.02, .07]			Y	Structural model: χ2 (59) = 319.66, *p* < .001; *RMSEA* = .075; *SRMR* = .053; *CFI* = .91
	Gratitude → Interpersonal relationship disturbance → School well-being (pathway)	β = − .33, *p* < .001	β = − .44, *p* < .001	β = 0.44, *p* < .001	β = .15, *p* < .001, 95% CI [.08, .22]			Y	
	Gratitude → Perceived social support → School well-being (pathway)	β = .42, *p* < .001	β = .23, *p* < .001	β = 0.44, *p* < .001	β = .10, *p* < .01, 95% CI [.06, .15]			Y	
	Interpersonal relationship disturbance → Perceived social support (pathway)						β = .44, *p* < .001		
Tian, Pi, Huebner & Du (2016a)	Gratitude → Competence, Autonomy and Relatedness need satisfaction → Subjective well-being in school (model)			*r* = .27, *p* < .001 β = 0.35, *p* < .001					Measurement model: *CFI* = 0.95, *TLI* = 0.94, *IFI* = 0.95, *RMSEA* = 0.05
	Gratitude → Relatedness need satisfaction → Subjective well-being in school (pathway)	β = 0.40, *p* < .001	β = 0.26, *p* < .001		β = 0.26, *b* = 0.389, *SE* = 0.0047, 95% CI [0.241, 0.626], R^2 = 0.634			Y	Structural model: *CFI* = 0.95; *TLI* = 0.94; *IFI* = 0.95; *RMSEA* = 0.05
	Gratitude → Competence need satisfaction → Subjective well-being in school (pathway)	β = 0.36, *p* < .001	β = 0.72, *p* < .001		β = 0.11, *b* = 0.160, *SE* = 0.0060, 95% CI [0.068, 0.324], R² = 0.268			Y	
	Gratitude → Relatedness need satisfaction → Autonomy need satisfaction → Subjective well-being in school (pathway)				β = 0.02, *b* = 0.032, *SE* = 0.0002, 95% CI [0.009, 0.083], R^2 = 0.049			Y	

Study	Model/ pathway	Predictor → Mediator (a)	Mediator → Outcome (b)	Direct effects Predictor → Outcome (c')	Indirect effects (ab)	Total effects (c)	Additional paths	Significant mediation	Fit indices for best/ final model [a]
	Gratitude → Competence need satisfaction → Autonomy need satisfaction → Subjective well-being in school (pathway)				β = 0.02, b = 0.030, SE = 0.0008, 95% CI [0.006, 0.081], R² = 0.049			Y	
	Competence → Autonomy (pathway)						β = .31, p < .001		
	Relatedness → Autonomy (pathway)						β = .25, p < .001		
	Autonomy → Subjective well-being in school (pathway)						β = .20, p < .001		
Tian, Chu & Huebner (2016b)	Gratitude → Prosocial behaviour and Positive affect in school → School satisfaction (model)			r = .48, p < .01 β = 0.44, p < .001	β = 0.11, b = 0.229, SE = 0.0007, 95% CI [0.072, 0.517], R² = 0.244				Measurement model: CFI = 0.93, TLI = 0.91, IFI = 0.93, RMSEA = 0.08
	Gratitude → Prosocial behaviour → School satisfaction (pathway)	β = 0.52, p < .001	β = 0.40, p < .001		β = 0.21, b = 0.407, SE = 0.0140, 95% CI [0.195, 0.749], R² = 0.467				Structural model: CFI = 0.93, IFI = 0.93, TLI = 0.91, RMSEA = 0.08
	Gratitude → Positive affect → School satisfaction (pathway)	β = 0.17, p < .001	β = 0.43, p < .001		β = 0.07, b = 0.145, SE = 0.0130, 95% CI [0.009, 0.380], R² = 0.156	Total effect = 0.18, R² = 0.47			
	Prosocial behaviour → Positive affect (pathway)						β = 0.51, p < .001		
	Gratitude → Prosocial behaviour and Negative affect in school → School satisfaction (model)				β = 0.03 b = 0.066, SE = 0.0007, CI [0.0228, 0.1106], R² = 0.0003				Measurement model: CFI = 0.93, TLI = 0.92, IFI = 0.93, RMSEA = 0.08
	Gratitude → Prosocial behaviour → School satisfaction (pathway)	β = 0.53, p < .001	β = 0.57, p < .001		β = 0.30, b = 0.557, SE = 0.0070, 95% CI [0.3456, 0.9380], R² = 0.667				Structural model: CFI = 0.93, IFI = 0.93, TLI = 0.92, RMSEA = 0.08

Study	Model/ pathway	Predictor → Mediator (a)	Mediator → Outcome (b)	Direct effects Predictor → Outcome (c')	Indirect effects (ab)	Total effects (c)	Additional paths	Significant mediation	Fit indices for best/ final model [a]
	Gratitude → Negative affect → School satisfaction (pathway)	β = − 0.19, *p* <.001	β = − 0.28, *p* < .001		β = 0.05, *b* = 0.107, *SE* = 0.0090, 95% CI [0.0050, 0.2700], *R²* = 0.111	*Total effect* = 0.08, *R²* = 0.178			
	Prosocial behaviour → Negative affect (pathway)						β = − 0.22, *p* < .001		
You, Lee, Lee & Kim (2018)	Males: Gratitude → Social support → Life Satisfaction (single)	β = .55, *p* < .05	β = .27, *p* < .05	β = .65, *p* < .05	β = 0.17, *p* < .001, 95% CI [0.11, 0.22]			Y	Structural models: Males, Social support: χ2 (33) = 95.76, *CFI* = 0.975, *NNFI* = 0.965, *RMSEA* = 0.065
	Females: Gratitude → Social support → Life Satisfaction (single)	β = .61, *p* < .05	β = .37, *p* < .05	β = .58, *p* < .05	β = 0.16, *p* < .001, 95% CI [0.11, 0.20]			Y	Females, Social support: χ2 (33) = 151.99, *CFI* = 0.951, *NNFI* = 0.934, *RMSEA* = 0.071
	Males: Gratitude → Emotional difficulties → Life Satisfaction (single)	β = − .10, *p* < .05	β = − .16, *p* < .05	β = .80, *p* < .05	β = 0.032, *p* < .001, 95% CI [0.014, 0.051]			Y	Males, Emotional difficulty: χ2 (149) = 309.38, *CFI* = 0.941, *NNFI* = 0.986, *RMSEA* = 0.065
	Females: Gratitude → Emotional difficulties → Life Satisfaction (single)	β = − .17, *p* < .05	β = -.18, *p* < .05	β = .78, *p* < .05	β = 0.032, *p* < .001, 95% CI [0.014, 0.049]			Y	Females, Emotional difficulties: χ2 (149) = 479.28, *CFI* = 0.959, *NNFI* = 0.996, *RMSEA* = 0.052
Zhou, Zhen & Wu (2019)	Gratitude → Social support → Self-esteem → State hope → Life satisfaction (model)			β = 0.016, *SE* = 0.056, 95% CI [− 0.077, 0.108]/ β = .18, p<.01	β = 0.017, *SE* = 0.006, 95% CI [0.007, 0.028]			Y	Measurement model: χ2 (13) = 45.428; *CFI* = 0.983; *TLI* = 0.973; *RMSEA* (90% CI) = 0.079 (0.055–0.105); *SRMR* = 0.026
	Gratitude → Social support → Life satisfaction (pathway)	β = .35, *p* < .001	β = .009, *p* > .05		β = 0.031, *SE* = 0.021, 95% CI [− 0.004, 0.066]			N	

Study	Model/ pathway	Predictor → Mediator (a)	Mediator → Outcome (b)	Direct effects Predictor → Outcome (c')	Indirect effects (ab)	Total effects (c)	Additional paths	Significant mediation	Fit indices for best/ final model [a]
	Gratitude → Self-esteem → Life satisfaction (pathway)	β = .12, *p* < .05	β =.50, *p* < .001		β = 0.019, *SE* = 0.014, 95% CI [− 0.004, 0.042]			N	Structural model: χ2 (33) = 97.663; *CFI* = 0.970; *TLI* = 0.950; *RMSEA* (90% CI) = 0.072 (0.056–0.089); *SRMR* = 0.036
	Gratitude → Hope → Life satisfaction (pathway)	β = .11, *p* < .05	β = .42, *p* < .001		β = 0.047, *SE* = 0.028, 95% CI [0.001, 0.093]			Y	
	Gratitude → Social support → Self-esteem → Life satisfaction (pathway)				β = 0.013, *SE* = 0.007, 95% CI [0.002, 0.024]			Y	
	Gratitude → Social support → Hope → Life satisfaction (pathway)				β = 0.010, *SE* = 0.010, 95% CI [− 0.007, 0.052]			N	
	Gratitude → Self-esteem → Hope → Life satisfaction (pathway)				β = 0.026, *SE* = 0.016, 95% CI [> 0.000, 0.052]			Y	
	Social support → Self-esteem (pathway)						β = .24, *p* < .001		
	Self-esteem → Hope (pathway)						β = .50, *p* < .001		
	Social support → Hope (pathway)						β = .06, *p* > .05		

[a] Fit indices: CFI = comparative fit index, GFI = goodness-of-fit index, TLI = Tucker-Lewis index, RMSEA = root-mean-square error of approximation, SRMR = standardised root-mean-square residual, AIC = Akaike information criterion, NNFI = non-normed fit index, IFI = incremental fit index.

Appendix F   Quality Assessment Checklist

Study quality assessment tool for observational mediation studies (Lee at al., 2015).

Items	Yes	No
1. Did the study cite a theoretical framework?		
2. Were the psychometric characteristics of the mediator and outcome variables reported? (Computed from the present study or a reference provided)		
3. Did the study report a power calculation? If so, was the study adequately powered to detect mediation?		
4. Were statistically appropriate/ acceptable methods of data analysis used? (This includes the product of coefficient approach with bootstrapped confidence intervals, structural equation modelling, latent growth modelling, and causal mediation analysis)		
5. Did the study ascertain whether changes in the mediating variable preceded changes in the outcome variable?		
6. Did the study ascertain whether changes in the predictor variable preceded changes in the mediator variable?		
7. Did the study control for possible confounding factors (e.g., baseline values)?		

This is an adapted version of a quality assessment tool that was designed for treatment mediation studies (Mansell et al., 2013). We consulted the original authors of this tool to identify items that were most relevant to observational mediation studies. Item 6 was added to account for the temporal precedence of the predictor and mediator variables.

Appendix G   Definitions of Study Mediators

Study	Variable	Definition
Armenta (2020)	Connectedness	"feelings of closeness and social connection" (p.2)
	Elevation	"feeling moved and inspired to emulate moral acts done by others, and by a desire to help others and be a better person" (p.2)
	Humility	"defined by an accurate assessment of one's own strengths and weaknesses, as well as openness to critical feedback and room for self-improvement" (p.2)
	Indebtedness	"feeling obligated to repay their benefactor" (p.2)
	Negative affect	"negative emotions…that serve as obstacles to self-improvement endeavors and LS [life satisfaction], including anxiety, frustration and doubt" (p.2)
Caleon, Ilham, Ong & Tan (2019)	Positive relationships	"the quality of students' relationship with their parents, teachers, classmates and friends" (p.306)
	School resilience	"students' perceived ability to respond positively to significant stressors that may affect their school functioning" (p.306)
Chen (2013)	Perceived coach support	"emotional support, self-esteem support, and informational support from…coaches" (p.281)
	Perceived teammate support	"emotional support, self-esteem support, and informational support from teammates" (p.281)
	Team satisfaction	"a lower level of satisfaction in athlete experience" (p.276)
Chen, Kee & Chen (2015)	Perceived team cohesion	"a dynamic process that reflects the tendency for a group to stick together and remain united in the pursuit of … the satisfaction of member affective needs" (p.464)
Datu & Mateo (2015)	Presence of meaning in life	"subjective perception as to whether or not life is meaningful" (p.200)
	Search for meaning in life	"eagerness to understand meaning in life" (p.200)

Study	Variable	Definition
Froh, Yurkewicz & Kashdan (2009)	Gratitude in response to aid	"feelings of grateful, appreciative, understood, and glad" in response to help or advice (p.638)
	Negative affect	Feeling "distressed, irritable, ashamed, upset, nervous, guilty, hostile, afraid, jittery and/or scared" (p.638)
	Physical symptoms	"headaches, dizziness, stomach ache/pain, shortness of breath, chest pain, runny nose, feeling chilly or really hot, not feeling hungry or not eating, coughing/sore throat, stiff or sore muscles, nausea or felt like you were going to throw up" (p.638)
	Positive affect	Feeling "interested, excited, alert, strong, determined, attentive, forgiving, hopeful, enthusiastic, active, inspired, and/or proud" (p.638)
	Prosocial behaviour	Helping someone with a problem or offering emotional support
	Social support	"supportive peer and familial relationships" (p.639)
Jiang, Sun, Liu & Pan (2016)	Materialism	"the importance individuals attach to worldly possessions or acquiring possessions that individuals consider necessary to pursuit happiness" (p.1364)
Kong, Yang, Yan & Li (2020)	Resilience	"the capacity to relieve negative effects of stressors and promote positive adaptations" (p.2)
	Social support	"a process of providing or exchanging resources with others, such as families, friends and significant others" (p.3)
Lin (2016)	Coping style	"strategies employed to manage behaviors, emotions, and cognitions when people experience stress" (p.14)
	Social support	"a process of providing or exchanging resources with other people" (p.14)
Oriol, Miranda, Bazan & Benavente (2020)	Meaning in life	"two dimensions: presence (e.g., "I am always looking to find my life's purpose) and search (e.g., "I am looking for something that makes my life feel meaningful")" (p.9)

Study	Variable	Definition
Sun, Jiang, Chu & Qian (2014)	Interpersonal relationship disturbance	"four sources of interpersonal relationship disturbance: interpersonal conversation, making friends, dealing with others, and opposite-sex communication" (p.1692)
	Social support	"three sources of support: significant others, family, and friends" (p.1692)
Tian, Du & Huebner (2015)	Prosocial behaviour	"acts undertaken to protect or enhance the welfare of others" (p.889)
Tian, Pi, Huebner & Du (2016)	Autonomy need satisfaction	"Autonomy needs at school represent students' experiences of strength of will and self-endorsement of their school behavior" (p.2)
	Competence need satisfaction	"Competence needs at school represent students' experiences related to the development and expression of their personal abilities in school" (p.2)
	Relatedness need satisfaction	"Relatedness needs at school represent students' feelings of belonging in school, which includes their connections with their teachers and classmates" (p.2)
Tian, Chu & Huebner (2016)	Negative affect in school	"a student's frequency of negative emotions experienced during school (e.g., gloomy, angry)" (p.517)
	Positive affect in school	"a student's frequency of positive emotions experienced during school (e.g., happy, delighted)" (p.517)
	Prosocial behaviour	"altruism behaviors (e.g., I will promptly prevent people from behaving immorally once I see it), behaviors abided by rules (e.g., I care for my family's health), social behaviors (e.g., I will not bother others when we watch TV or listen to music), and otherness behaviors (e.g., I will try to meet other's demands, even if it may harm my own interests)" (p.520)
Tsang, Carpenter, Roberts, Frisch & Carlisle (2014)	Need satisfaction	"psychological needs as ''evolved tendencies to seek out certain basic types of psychosocial experiences and to feel good and thrive when those basic experiences are obtained''… when basic psychological needs are

Study	Variable	Definition
		met, which include relatedness, autonomy, and competence" (p.64)
Wood, Joseph & Linley (2007)	Coping	"forms of coping, including styles generally involving adaptively approaching the adversity (active coping, seeking instrumental support, seeking emotional support, planning, and positive reinterpretation and growth) generally maladaptively withdrawing from the problem (denial, behavioural disengagement, alcohol and drug use, and mental disengagement), and other common strategies which do not clearly fall into either category (acceptance, turning to religion, humour, and focus on venting emotions)" (p.1081)
You, Lee, Lee & Kim (2018)	Emotional difficulties	"emotional problems like anxiety, depression and fear, and due to such difficulties one may either overly suppress their own behaviors or not express them at all" (p.123)
	Social support	"quality and recognition of one's relationships and interactions with others" (p.123)
Zhou, Zhen & Wu (2019)	Self-esteem	"an individual's positive or negative attitude toward the self as a totality" (p.1783)
	Social support	"an individual's perception of support provided by others" (p.1783)
	State hope	"a positive motivational state that is based on an interactively derived sense of successful (a) agency (goal-directed energy), and (b) pathways (planning to meet goals)" (p.1783)

Appendix H   Aspects of Gratitude Included in the Initial QUAY

Feature of gratitude	Relevant literature	Component	Definition	Contribution to new questionnaire
Gratitude can exist as a trait and a state	Emmons et al. (2019), Wood, Maltby et al., (2008)	Trait	Stable over time (long term)	The questionnaire is primarily designed to measure gratitude as a trait. However, responses of *sometimes* to an item may suggest that construct is more of a momentary state. The *Emotions* items may also capture these momentary experiences.
		State	A momentary state such as a mood (medium term) or an emotion (short term)	
Gratitude has affective, cognitive and behavioural components	Halberstadt et al. (2016), Rusk et al. (2015)	Affective	Emotional experiences and responses	*Emotions* items
		Cognitive	Recognising things to be grateful for, thinking styles and patterns	*Attention and awareness, Comprehension and coping,* and *Goals and Habits* items
		Behavioural	Expressing gratitude, showing appreciation, including rituals or practises	*Goals and Habits* and *Relationships and virtues* items
Gratitude can be interpersonal and intrapersonal	Peterson & Seligman (2005), Rusk et al. (2015)	Intrapersonal	Also known as dyadic gratitude, or appreciation. Involves feeling grateful for a gift not given by another person, such as nature.	*Attention and awareness, Comprehension and coping, Goals and Habits,* and *Emotions* items
		Interpersonal	Also known as triadic gratitude. Involves feeling grateful towards another person for a gift or kind act provided by them. Can also involve expressing gratitude to a benefactor.	*Relationships and virtues* items
Gratitude has (at least) four developmental stages: verbal, concrete, connective and finalistic and becomes more sophisticated over time.	Baumgarten-Tramer (1938), de Lucca Freitas et al. (2011)	Verbal	Saying 'thank you'. Can be in the form of an obligation/ habit/ manners, or when appreciation is genuinely felt. Most frequent around age 7.	Fewer items as below the target age range of the questionnaire. But, an example could include: 14. It is important to say 'thank you' if someone does something nice for you.
		Concrete	Ego-centric. Expressing gratitude by repaying the benefactor with something valuable to the child not the benefactor. Most frequent around age 8.	Fewer items as towards the lower end the target age range. Example items include: 16. The best things in life are expensive presents.

Feature of gratitude	Relevant literature	Component	Definition	Contribution to new questionnaire
				26. I feel happy if someone does a kind thing for me.
		Connective	Creation of a relationship with the benefactor. Expressed by an act beneficial to the benefactor, to society, or something more abstract such as expressing emotions or considering them a good friend. Most frequent around ages 10-11.	Most items. Most relevant examples include: 2. People help and support me. 10. If someone does something kind for me, I will do something for them in return. 15. Other people give up their time to help me. 18. My friends and I do kind things for each other. 20. People around me want me to have a good life.
		Finalistic	Expressing/ repaying gratitude by making the most of opportunities, for example, showing gratitude for a job by turning up on time. Most frequent around ages 13-14+.	Some more sophisticated items reflecting a general appreciation for opportunities in life. For example: 9. I am so lucky compared to some other children. 11. I feel happy to have the life that I have. 17. I think about good things that have happened to me in the past. 19. When something good is happening, I try to enjoy it as much as I can. 21. I feel more thankful when someone does something for me if it has taken them a lot of effort.
Aspects of gratitude and appreciative functioning can be organised into five domains: attention and awareness, comprehension and coping, emotions, goals and habits, and relationships and virtues	Rusk et al. (2015)	Attention and awareness	"Attending to stimuli in the present moment, noticing simple things of value, searching for positive aspects of situations, attending to positive past situations, attending to tangible and intangible assets" (p.5)	Attention and awareness items: 3. I have lots of things in my life to be thankful for. 4. Simple things can make me happy. 6. Small, good things can happen, even on a bad day. 17. I think about good things that have happened to me in the past. 25. I notice when good things happen in my day.
		Comprehension and coping	"Belief that one's life has many good things, considering situations that might have been, comparing one's situation to those of others, appreciating the temporary nature of situations, beliefs that influence gratefulness, using gratefulness to combat negative emotions,	Coping and comprehension items: 1. I can easily think of lots of things I am thankful for. 5. I feel jealous of other children. 7. I am a grateful person. 8. I can think about the things I am grateful for to cheer me up if I am feeling sad.

Feature of gratitude	Relevant literature	Component	Definition	Contribution to new questionnaire
			finding benefits of negative situations, viewing oneself as a grateful person, perceived ability to regulate one's gratefulness" (p.5)	9. I am so lucky compared to some other children.
		Emotions	"The frequency or strength of feeling grateful, feeling content with one's life, lacking feelings of resentment or regret, feeling privileged or fortunate and not entitled, feelings of awe and wonder" (p.5)	Emotions items: 11. I feel happy to have the life that I have. 12. I look around and feel amazed by the things I see. 13. There are lots of things I would like to change about my life. 22. It takes me a long time to feel better after something annoys me. 26. I feel happy if someone does a kind thing for me.
		Goals and habits	"Valuing non-material assets over material goods, valuing gratefulness as important, intending to experience gratefulness, having regular habits that promote gratefulness, working together with others to achieve goals, rituals enhancing the benefits of positive events" (p.5)	Goals and habits items: 16. The best things in life are expensive presents. 19. When something good is happening, I try to enjoy it as much as I can. 23. I like being thankful. 24. Taking time to be thankful is something I try to do each day. 27. I remind myself to be thankful.
		Relationships and virtues	"benefits provided through the agency of others, cost to the benefactors of their agency, social consequences of gratitude, expressing gratitude to others, giving or showing kindness to others, one's relationships with others, social norms that support gratefulness" (p.5)	Relationships and virtues items: 2. People help and support me. 10. If someone does something kind for me, I will do something for them in return. 14. It is important to say 'thank you' if someone does something nice for you. 15. Other people give up their time to help me. 18. My friends and I do kind things for each other. 20. People around me want me to have a good life. 21. I feel more thankful when someone does something for me if it has taken them a lot of effort.

Appendix I   Process of Item Refinement in Response to Feedback

Domain [a]	Version 1		Version 2		Version 3		Refined version
	Items	Notes [b]	Items	Notes [c]	Items	Notes [d]	Items
Attention and awareness Present moment Simple pleasures Positive searching (interpretation) Reminiscence (nostalgia) 'Have' focus	When something bad happens, I try to look for something good about the situation.	-	When something bad happens, I try to look for something good about the situation.	Interpreted this as doing something to help themselves or others feel better if something bad happens- e.g. if sisters fighting, find them something they like doing.	Small good things can happen, even on a bad day.	Technically the reworded version is asking a different thing. The original wording was about reframing an incident, whereas the rewording is about reframing a day. I don't per say have a problem with this, but I think you should do a quick check back to the framework this is based on to make sure that this slight shift still remains faithful to it.	Small good things can happen, even on a bad day.
	Simple things can make me happy.	-	Simple things can make me happy.	E.g. cake, doing homework, a 'regular present', things that are easy to get	Simple things can make me happy.	-	Simple things can make me happy.

Domain [a]	Version 1		Version 2		Version 3		Refined version
	Items	Notes [b]	Items	Notes [c]	Items	Notes[d]	Items
	I have lots of things in my life to be thankful for.	-	I have lots of things in my life to be thankful for.	E.g. Friends, being in … class, my teacher, my school	I have lots of things in my life to be thankful for.	-	I have lots of things in my life to be thankful for.
	I often think about good things that have happened to me in the past.	Take out 'often' as rating scale focuses on frequency	I think about good things that have happened to me in the past.	All gave an example of something good that had happened to them in the past- a holiday a year ago, getting an award at school earlier that week, getting a pet	I think about good things that have happened to me in the past.	-	I think about good things that have happened to me in the past.
	-	Something to capture awareness/ present moment	I notice when good things happen in my day.	E.g. I get happy if I'm bored and then xxx and xxx come and play	I notice when good things happen in my day.	-	I notice when good things happen in my day.
Comprehension and coping	I am so lucky compared to some other children.	-	I am so lucky compared to some other children.	They might not have as much as you	I am so lucky compared to some other children.	-	I am so lucky compared to some other children.
Beliefs of abundance Counter- factual thinking Social comparison Impermanence Schemas Refocussing	*I feel jealous of other children.	-	* I feel jealous of other children.	If you want things other people have, if they had a regular cookie and you had a chocolate one, they might be jealous of you	*I feel jealous of other children.	-	*I feel jealous of other children.
Benefit finding Self- concept Self- efficacy	I am a grateful person.	-	I am a grateful person.	If you are happy for the things you have	I am a grateful person.	-	I am a grateful person.

Domain [a]	Version 1		Version 2		Version 3		Refined version
	Items	Notes [b]	Items	Notes [c]	Items	Notes[d]	Items
	I can think about the things I am grateful for to cheer me up if I am feeling sad.	-	I can think about the things I am grateful for to cheer me up if I am feeling sad.	E.g. If my brother hurts me, I would think of my Nintendo and then play on it – again interpreted as doing the nice thing as well as thinking about it. Keep- could tap into 'refocusing'	I can think about the things I am grateful for to cheer me up if I am feeling sad.	-	I can think about the things I am grateful for to cheer me up if I am feeling sad.
	I can easily think of lots of things I am thankful for.	-	I can easily think of lots of things I am thankful for.	Gave lots of examples of things they were thankful for.	I can easily think of lots of things I am thankful for.	-	I can easily think of lots of things I am thankful for.
Emotions Affective gratefulness Contentment Acceptance Privilege Awe	*It takes me a long time to feel better after something annoys me.	-	*It takes me a long time to feel better after something annoys me.	All gave examples- not that often- I just go to my room and be on my own, always- it takes me one or two days to forget about it	*It takes me a long time to feel better after something annoys me.	-	*It takes me a long time to feel better after something annoys me.
	I feel happy to have the life that I have.	-	I feel happy to have the life that I have.	E.g. Happy to be in xxx class, other people might not have a home but I do	I feel happy to have the life that I have.	-	I feel happy to have the life that I have.
	I look around and feel amazed by the things I see.	-	I look around and feel amazed by the things I see.	E.g. When I went to a car show on my birthday and saw all my favourite cars	I look around and feel amazed by the things I see.	-	I look around and feel amazed by the things I see.

Domain [a]	Version 1		Version 2		Version 3		Refined version
	Items	Notes [b]	Items	Notes [c]	Items	Notes[d]	Items
	*There are lots of things I would like to change about my life.	-	*There are lots of things I would like to change about my life.	E.g. I wouldn't change being in my class, I would change my room so I don't have to share with my xxx who annoys me	*There are lots of things I would like to change about my life.	-	*There are lots of things I would like to change about my life.
	-	Need something to link feeling happy as a result of gratitude	I feel happy if someone does a kind thing for me.	Yes- e.g. getting me a present	I feel happy if someone does a kind thing for me.	-	I feel happy if someone does a kind thing for me.
Goals and habits Simplicity Valuing gratefulness Intention and motivation Rituals Co-operation Savouring	It is important to be thankful for the things I have.	An element of social judgement/ desirability? Focus more on value to them.	I like being thankful.	Not sure if quite grasped the feeling- because I have nice friends and teacher, don't want to hurt feelings if I say this present's not good	Rephrase to- 'being thankful feels good/ nice/ makes me feel happy?'	Keep for now as seemed to capture them seeing why gratitude could feel better than being 'ungrateful'	I like being thankful
	I try hard to enjoy good things that are happening.	-	I try hard to enjoy good things that are happening.	All misinterpreted – if it was good, you wouldn't have to try, if you were enjoying it, you might try hard e.g. a game, my xxx said don't fight at Christmas- try to have a nice time- how else can I capture intention?	When something good is happening, I try to enjoy it as much as I can.	-	When something good is happening, I try to enjoy it as much as I can.

Domain [a]	Version 1		Version 2		Version 3		Refined version
	Items	Notes [b]	Items	Notes [c]	Items	Notes[d]	Items
	*The best things in life are expensive gifts.	Presents- more concrete	*The best things in life are expensive gifts.	Not really, some presents are good even if someone hasn't spent a lot of money	*The best things in life are expensive presents.	-	*The best things in life are expensive gifts.
	People help and support me.	-	People help and support me.	They help you, are kind, support you with your work.	People help and support me.	-	People help and support me.
	-	How elicit rituals using child-friendly language?	There is a time in the day when I feel thankful, like when eating a meal or before going to bed.	E.g. Thankful for dinner as I am hungry, polite to ask may I be excused, didn't know what 'saying grace' was- I explained and they said if you did that you would answer 'always' – not sure of a better way to rephrase	Taking time to be thankful is a part of my daily routine.	I'm a little unsure about whether all children would understand 'daily routine' Maybe change to, "taking time to be thankful is something I try to find time for every day"?	Taking time to be thankful is something I try to do each day.
	-	Something about intention?	I remind myself to be thankful.	Yes because I might hurt people's feelings if I don't – more about saying thank you than feeling?	I remind myself to be thankful.	-	I remind myself to be thankful.
Relationships and virtues

Agency of others | People try hard to help me. | Too abstract? How else do we capture whether they can recognise the | Other people give up their time to help me. | My bed broke and my brother helped me fix it, but he did like doing it | Other people give up their time to help me. | - | Other people give up their time to help me. |

Domain [a]	Version 1		Version 2		Version 3		Refined version
	Items	Notes [b]	Items	Notes [c]	Items	Notes [d]	Items
Costly benefit Relational impact Kindness		agency/ theory of mind of others and the cost to them?					
Social expression Relationships Social norms	People around me want me to have a good life.	-	People around me want me to have a good life.	My xxx wants me to be happy and have a good life, some misinterpretations, e.g. my xxx wants me to grow up nice and not be a thief, my xxx wants me to be outside not stuck indoors	People around me want me to have a happy life.	-	People around me want me to have a happy life.
	If someone does something kind for me, I will do something for them in return.	Simplify wording	If someone does something kind for me, I will do something kind back.	E.g. If my mum helps me with my homework, I might help her with her day, like get her a drink	If someone does something kind for me, I will do something kind back.	-	If someone does something kind for me, I will do something kind back.
	It is important to say 'thank you' if someone does something nice for you.	Keep 'important' here as tapping into social norms	It is important to say 'thank you' if someone does something nice for you.	E.g. If my mum made me a cake on my birthday, I would say thank you and maybe make her a cake on mothers' day	It is important to say 'thank you' if someone does something nice for you.	-	It is important to say 'thank you' if someone does something nice for you.
	My friends and I do kind things for each other.	-	My friends and I do kind things for each other.	All gave examples- made each other cards, get their coat/ hold their bag, help each	My friends and I do kind things for each other.	-	My friends and I do kind things for each other.

Domain [a]	Version 1		Version 2		Version 3		Refined version
	Items	Notes [b]	Items	Notes [c]	Items	Notes[d]	Items
				other when feeling down			
	-	Need something to tap into cost-benefit; are children more grateful when the cost is more?	I feel more thankful when someone does something for me if it has taken them a lot of effort.	Little unclear- I am still thankful for little things, my xxx sewed my trousers when they split (did that take effort? Yes), my xxx asked xxx if I could see my xxx more	I feel more thankful when someone does something for me, if it has taken them a lot of effort.	-	I feel more thankful when someone does something for me, if it has taken them a lot of effort.
General notes	Change Likert scale descriptors from agree/disagree to never/always and update questions to reflect this scale- less abstract for children to think about whether they actually do those things or not. Add items to each section to make initial item pool overinclusive.		Children understood the likert scale as demonstrated by giving an example that was consistent with the response they would give on the scale		-		-

Note. Items marked with an asterisk are reverse scored.

[a] From Rusk et al. (2015).

[b] From supervisor discussion 1.

[c] From child focus group.

[d] From supervisor discussion 2.

Appendix J   Confirmation of Ethical Approval

Appendix K   Parent Information Sheet (Focus Group)

Parent Information Sheet

Study Title: Developing a questionnaire to measure children's gratitude.

Researcher: Sophie Smith

ERGO number: 60736.A1

Your child is being invited to take part in the above research study. To help you decide whether you would like them to take part or not, it is important that you understand why the research is being done and what it will involve. Please read the information below carefully and ask questions if anything is not clear or you would like more information before you decide to take part in this research. You may like to discuss it with others but it is up to you to decide whether or not you would like your child to take part. There are two parts to the study. If you are happy for your child to participate in the first part (a focus group), you will need to sign a consent form and return it to the school. If consent forms are returned for more children than needed for the focus group, they will be selected to take part at random. For the second part (filling in a questionnaire), if you are happy for them to participate you will not need to do anything. If you do not want them to take part, you will need to sign the opt-out consent form and return it to your child's school.

What is the research about?

My name is Sophie Smith and I am training to be an Educational Psychologist at the University of Southampton. This project is part of my Doctorate in Educational Psychology qualification. I am also on a placement with a local authority educational psychology service, where I work with parents and school staff to help improve outcomes for children and young people. One way we do this is using Positive Psychology, which focuses on building on individuals' strengths and things that are already working well for them. Gratitude diaries are a Positive Psychology intervention which encourage people to note down several things they are grateful for or that they have appreciated that day. Some initial research links gratitude diaries to positive outcomes such as wellbeing, and children's sense of belonging in school.

It is helpful to have a suitable way of measuring children's gratitude, to see if this type of intervention does result in changes to children's reported gratitude. At the moment, most research is using a measure which was designed for adults, and only has six questions. I have designed a new measure of gratitude which is aimed specifically at children and may allow us to detect more subtle differences in gratitude than this existing measure. I also want to find out how my new questionnaire compares with the existing measure, in terms

of how children score on each one. It is my hope that this new questionnaire will be used by researchers studying children's gratitude in future work. I will also be asking some children and teachers to have a look at the questions to see if they are appropriately worded for year 4 and 5 children to read and answer independently.

Why has my child been asked to participate?

Your child's school has been asked to take part in this study, as I am looking for year 4 and 5 children to test out my new questionnaire. All the children in each year 4 and 5 class have been offered the opportunity to participate.

What will happen to my child if they take part?

They will be asked to participate in either one or two 30-minute sessions, roughly a month apart (I will be asking some classes to complete the questionnaires twice, to see if their responses are consistent on both occasions). I (the researcher) will give a short verbal introduction. This will be read out by a member of school staff, or provided as a video recording, if the school's Covid-19 risk assessment means it is not possible for the researcher to do this at the school in person. The children will be told they don't have to take part if they don't want to, and that they can tell their teacher if they want to stop at any time. The children will then be asked to complete two questionnaires in school. The questions will be read aloud to the class and children will circle their answers on paper. The same process will be followed in the second session, if that class is participating. At the end, I will give a short debrief, explaining to the children what the study was about, and will thank them for taking part. This will be read out by a member of school staff, or provided as a video recording, if the school's Covid-19 risk assessment means it is not possible for the researcher to do this at the school in person. I will take the questionnaires away with me.

Children who take part in the focus group to give feedback on the wording of the questionnaire will be invited to take part in a discussion, lasting no longer than an hour. This will be with no more than 5 other children in year 4 and 5 at their school, and take place in school, during school hours. They will be shown the questions and asked to tell me if they think the questions make sense. I will make notes from their feedback. No names will be used in the notes, and the session will not be audio recorded. If the school's Covid-19 risk assessment means that the researcher cannot safely conduct the focus group in person, it will be held via video call using Microsoft Teams, with a member of school staff present for the duration of the call. The call will be held on a school computer, using a staff member's email address. It will not be audio or video recorded in any way.

Are there any benefits in my child taking part?

There are no direct benefits to your child, however this study will help our understanding of children's gratitude. This could be helpful to schools who are considering using gratitude interventions in the future. Your child will be given a 'thank you' postcard for taking part.

Are there any risks involved?

This study does not involve any risks to your child, and all tasks they complete as part of the study will not differ greatly from tasks they would usually be given as part of a typical school day.

What data will be collected?

The children will be asked to write their birthday and gender on one of the questionnaires. This is so we can provide the average age and gender distribution in the write up of our study. Once the children's questionnaires are completed, their names will be removed and replaced with a participant number, to ensure all data is anonymous. No analysis will be carried out until everything has been anonymised.

Will my child's participation be confidential?

Your child's participation during the course of the research will be kept strictly confidential. The information we collect about them will be anonymised.

Only members of the research team and responsible members of the University of Southampton may be given access to anonymised data collected for monitoring purposes and/or to carry out an audit of the study to ensure that the research is complying with applicable regulations. Individuals from regulatory authorities (people who check that we are carrying out the study correctly) may require access also to this data. All of these people have a duty to keep information strictly confidential.

Participant numbers rather than names will be used in all the data analysis. The school will keep a list of the children's names and corresponding participant numbers, so that a child's data can be removed from the study if requested by their parent/carer or if a child decides they do not want to take part (or to withdraw part-way through the study). All paper documents (e.g. questionnaires) will be stored in a locked filing cabinet and will only be accessible by the researcher and university research supervisors. If you choose to opt your child out of the study, the consent form will be handled by your child's school who will ensure they do not take part, and your child's details will not be seen by the researcher. Any electronic data, (e.g. excel spreadsheets) will be stored on a secure, password protected laptop, and will only be accessible by the researcher and university research supervisors.

Does my child have to take part?

No, it is entirely up to you and your child to decide whether or not they take part. If you decide you want to take part, you do not need to do anything, and your child will be included in the study. If you do not want your child to take part, please complete and sign the attached opt-out consent form and return it to your child's school by [date].

What happens if I change my mind?

You have the right to change your mind and withdraw your child at any time without giving a reason and without their participant rights being affected. If your child would like to withdraw during the study, they can tell their teacher at any time. If you would like to withdraw your child, please email s.o.smith@soton.ac.uk simply stating the child's name and that would like to withdraw (this email will then be deleted, in line with the confidentiality procedures outlined above). You can withdraw your child up to a week after the end of the study.

What will happen to the results of the research?

Your child's personal details will remain strictly confidential. Research findings made available in any reports or publications will not include information that can directly identify your child. The results will be analysed and written up as part of the researcher's doctoral thesis project. This write-up will be available from the university's 'ePrints' website (eprints.soton.ac.uk) one year following its final submission; also, it might be published on the university's course blog (blog.soton.ac.uk/edpsych/) or submitted for publication in a peer reviewed journal. The results will also be shared with your child's school and a sheet explaining the results for parents/carers and the children will be provided.

Where can I get more information?

If you would like more information about this study, you can contact the researcher or research supervisors by email using the details below.

Sophie Smith (Researcher): s.o.smith@soton.ac.uk

Colin Woodcock (Supervisor): c.woodcock@soton.ac.uk

Catherine Brignell (Supervisor): c.brignell@soton.ac.uk

What happens if there is a problem?

If you have a concern about any aspect of this study, you should speak to the researchers who will do their best to answer your questions. You can use the contact details provided above.

If you remain unhappy or have a complaint about any aspect of this study, please contact the University of Southampton Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk).

Data Protection Privacy Notice

The University of Southampton conducts research to the highest standards of research integrity. As a publicly-funded organisation, the University has to ensure that it is in the public interest when we use personally-identifiable information about people who have agreed to take part in research. This means that when you agree to take part in a research study, we will use information about you in the ways needed, and for the purposes specified, to conduct and complete the research project. Under data protection law, 'Personal data' means any information that relates to and is capable of identifying a living individual. The University's data protection policy governing the use of personal data by the University can be found on its website (https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page).

This Participant Information Sheet tells you what data will be collected for this project and whether this includes any personal data. Please ask the research team if you have any questions or are unclear what data is being collected about you.

Our privacy notice for research participants provides more information on how the University of Southampton collects and uses your personal data when you take part in one of our research projects and can be found at http://www.southampton.ac.uk/assets/sharepoint/intranet/ls/Public/Research%20and%20Integrity%20Privacy%20Notice/Privacy%20Notice%20for%20Research%20Participants.pdf

Any personal data we collect in this study will be used only for the purposes of carrying out our research and will be handled according to the University's policies in line with data protection law. If any personal data is used from which you can be identified directly, it will not be disclosed to anyone else without your consent unless the University of Southampton is required by law to disclose it.

Data protection law requires us to have a valid legal reason ('lawful basis') to process and use your Personal data. The lawful basis for processing personal information in this research study is for the performance of a task carried out in the public interest. Personal data collected for research will not be used for any other purpose.

For the purposes of data protection law, the University of Southampton is the 'Data Controller' for this study, which means that we are responsible for looking after your information and using it properly. The University of Southampton will keep identifiable information about you for 10 years after the study has finished after which time any link between you and your information will be removed.

Your child's data will be anonymised through use of a participant number. The sheet linking names to participant numbers will be stored separately and securely. Only the researcher and research supervisor will have access to this, in case a participant needs to be removed. After the point of withdrawal (1 week after the study has ended), this sheet will be destroyed and there will be nothing linking your child's name to their data.

To safeguard your rights, we will use the minimum personal data necessary to achieve our research study objectives. Your data protection rights – such as to access, change, or transfer such information - may be limited, however, in order for the research output to be reliable and accurate. The University will not do anything with your personal data that you would not reasonably expect.

If you have any questions about how your personal data is used, or wish to exercise any of your rights, please consult the University's data protection webpage (https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page) where you can make a request using our online form. If you need further assistance, please contact the University's Data Protection Officer (data.protection@soton.ac.uk).

Thank you.

Thank you for taking the time to read the information sheet and considering taking part in the research.

Appendix L Parent Consent Form (Focus Group)

FOCUS GROUP CONSENT FORM

Study title: Developing a questionnaire to measure children's gratitude.

Researcher name: Sophie Smith

ERGO number: 60736

Please initial the box(es) if you agree with the statement(s):

I have read and understood the information sheet 29.07.2020, Version 1 and have had the opportunity to ask questions about the study.	
I agree for my child to take part in a focus group and agree for their feedback to be used for the purpose of this study.	
I understand my child's participation is voluntary and I may withdraw them until the day of the focus group for any reason without my or their participation rights being affected.	

Name of child (print name)…………………………………………………………………………………………

Name of parent (print name)………………………………………………………………………………………

Signature of parent…………………………………………………………………………………………………

Date…………………………………………………………………………………………..…………………

Name of researcher (print
name)………..

Signature of
researcher …………………………………………………………………….……………………………………

Date………..

Appendix M   School Information Sheet (Focus Group)

School Information Sheet

Study Title: Developing a questionnaire to measure children's gratitude.

Researcher: Sophie Smith

ERGO number: 60736

Your school is being invited to take part in the above research study. To help you decide whether you would like to take part or not, it is important that you understand why the research is being done and what it will involve. Please read the information below carefully and ask questions if anything is not clear or you would like more information before you decide to take part in this research. You may like to discuss it with others but it is up to you to decide whether or not to take part. If you are happy for your school to participate you will be asked to sign a consent form.

What is the research about?

My name is Sophie Smith and I am training to be an Educational Psychologist at the University of Southampton. This project is part of my Doctorate in Educational Psychology qualification. I am also on a placement with a local authority educational psychology service, where I work with parents and school staff to help improve outcomes for children and young people. One way we do this is using Positive Psychology, which focuses on building on individuals' strengths and things that are already working well for them. Gratitude diaries are a Positive Psychology intervention which encourage people to note down several things they are grateful for or that they have appreciated that day. Some initial research links gratitude diaries to positive outcomes such as wellbeing, and children's sense of belonging in school.

It is helpful to have a suitable way of measuring children's gratitude, to see if this type of intervention does result in changes to children's reported gratitude. At the moment, most research is using a measure which was designed for adults, and only has six questions. I have designed a new measure of gratitude which is aimed specifically at children and may allow us to detect more subtle differences in gratitude than this existing measure. I also want to find out how my new questionnaire compares with the existing measure, in terms of how children score on each one. It is my hope that this new questionnaire will be used by researchers studying children's gratitude in future work. I will also be asking some children and teachers to have a look at the questions to see if they are appropriately worded for year 4 and 5 children to read and answer independently.

Why has my school been asked to participate?

Your school has been asked to take part in this study because I am looking for children in year 4 and 5 to test out my new questionnaire, and I thought you may be interested in contributing to this. All the children in each year 4 and 5 class are offered the opportunity to participate. The aim is for one other school to take part, so overall, just over 200 children may be taking part.

What will happen to the children if they take part?

They will be asked to participate in either one or two 30-minute sessions, roughly a month apart (I will be asking some classes to complete the questionnaires twice, to see if their responses are consistent on both occasions). I (the researcher) will give a short verbal introduction. The children will be told they don't have to take part if they don't want to, and that they can tell their teacher if they want to stop at any time. The children will then be asked to complete two questionnaires in school. The questions will be read aloud to the class and children will circle their answers on paper. The same process will be followed in the second session, if that class is participating. At the end, I will give a short debrief, explaining to the children what the study was about, and will thank them for taking part. I will take the questionnaires away with me.

Children who take part in the focus group to give feedback on the wording of the questionnaire will be invited to take part in a discussion, lasting no longer than an hour. This will be with no more than 5 other children in year 4 and 5 at their school, and take place in school, during school hours. They will be shown the questions and asked to tell me if they think the questions make sense. I will make notes from their feedback. No names will be used in the notes, and the session will not be audio recorded.If the school's Covid-19 risk assessment means that the researcher cannot safely conduct the focus group in person, it will be held via video call using Microsoft Teams, with a member of school staff present for the duration of the call. The call will be held on a school computer, using a staff member's email address. It will not be audio or video recorded in any way.

Are there any benefits in my school taking part?

There are no direct benefits to your school, however this study will help our understanding of the children's gratitude, which may be beneficial to schools hoping to use gratitude interventions in the future. Children will be given a 'thank you' postcard for taking part.

Are there any risks involved?

This study does not involve any risks to the children, and all tasks they complete as part of the study will not differ greatly from tasks they would usually be given as part of a typical school day.

What data will be collected?

The children will be asked to write their birthday and gender on one of the questionnaires. This is so we can provide the average age and gender distribution in the write up of our study. Once the children's questionnaires are completed, their names will be removed and replaced with a participant number, to ensure all data is anonymous. The questionnaire will be kept by the researchers and scored securely at the university, with the children's names removed.

Will my school's participation be confidential?

Your school's participation and the information we collect about the children during the course of the research will be kept strictly confidential.

Only members of the research team and responsible members of the University of Southampton may be given access to data about you for monitoring purposes and/or to carry out an audit of the study to ensure that the research is complying with applicable regulations. Individuals from regulatory authorities (people who check that we are carrying out the study correctly) may require access to your data. All of these people have a duty to keep your information, as a research participant, strictly confidential.

Participant numbers rather than names will be used in all the data analysis. Your school will be asked to keep a list of the children's names and corresponding participant numbers, so that a child's data can be removed from the study if requested by their parent/carer. The name of the school will not be used in any aspect of the study. Participating schools will be labelled with numbers in the same way.

All paper documents (e.g. questionnaires) will be stored in a locked filing cabinet and will only be accessible by the researcher and university research supervisors. If a parent chooses to opt a child out of the study, the consent form will be handled by the school who will ensure they do not take part, and the child's details will not be seen by the researcher. Any electronic data, (e.g. excel spreadsheets) will be stored on a secure, password protected laptop, and will only be accessible by the researcher and university research supervisors.

Does my school have to take part?

No, it is entirely up to you to decide whether or not to take part. If you decide you want to take part, you will need to sign and complete the attached consent form. A parent/carer information sheet will also be provided, giving parents/carers the option to opt their child out of the study using an opt-out consent form.

What happens if I change my mind?

You have the right to change your mind and withdraw your school at any time without giving a reason and without your participant rights being affected. If you would like to withdraw your school during the study, you can contact the researcher at any time, using: s.o.smith@soton.ac.uk. You can withdraw your school at any time, up to a week after the data has been collected. Your school's data will not be included in the study but data we have may be stored by the university for the purposes of achieving the objectives of the study only.

What will happen to the results of the research?

Your school and the children's personal details will remain strictly confidential. Research findings made available in any reports or publications will not include information that can directly identify your children or school without your specific consent. The results will be analysed and written up as part of the researcher's doctoral thesis project. This write-up may be published on the university's course blog or submitted for publication in a peer reviewed journal. The results will also be shared with your school and a sheet explaining the results for parents/carers and the children will be provided.

Where can I get more information?

If you would like more information about this study, you can contact the researcher or research supervisors by email using the details below.

Sophie Smith (Researcher): s.o.smith@soton.ac.uk

Colin Woodcock (Supervisor): c.woodcock@soton.ac.uk

Catherine Brignell (Supervisor): c.brignell@soton.ac.uk

What happens if there is a problem?

If you have a concern about any aspect of this study, you should speak to the researchers who will do their best to answer your questions. You can use the contact details provided above.

If you remain unhappy or have a complaint about any aspect of this study, please contact the University of Southampton Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk).

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research study, we will use information about you in the ways needed, and for the purposes specified, to conduct and complete the research project. Under data protection law, 'Personal data' means any information that relates to and is capable of identifying a living individual. The University's data protection policy governing the use of personal data by the University can be found on its website (https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page).

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Data protection law requires us to have a valid legal reason ('lawful basis') to process and use your Personal data. The lawful basis for processing personal information in this research study is for the performance of a task carried out in the public interest. Personal data collected for research will not be used for any other purpose.

For the purposes of data protection law, the University of Southampton is the 'Data Controller' for this study, which means that we are responsible for looking after your information and using it properly. The University of Southampton will keep identifiable information about you for 10 years after the study has finished after which time any link between you and your information will be removed.

Your children's data will be anonymised through use of a participant number. The sheet linking names to participant numbers will be stored separately and securely. Only the researcher and research supervisor will have access to this, in case a participant needs to be removed. After the point of withdrawal (1 week after the study has ended), this sheet will be destroyed and there will be nothing linking your children's names to their data.

To safeguard your rights, we will use the minimum personal data necessary to achieve our research study objectives. Your data protection rights – such as to access, change, or transfer such information - may be limited, however, in order for the research output to

be reliable and accurate. The University will not do anything with your personal data that you would not reasonably expect.

If you have any questions about how your personal data is used, or wish to exercise any of your rights, please consult the University's data protection webpage (https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page) where you can make a request using our online form. If you need further assistance, please contact the University's Data Protection Officer (data.protection@soton.ac.uk).

Thank you.

Thank you for taking the time to read the information sheet and considering taking part in the research.

Appendix N   School Consent Form (Focus Group)

SCHOOL CONSENT FORM

Study title: Developing a questionnaire to measure children's gratitude.

Researcher name: Sophie Smith

ERGO number: 60736

Please initial the box(es) if you agree with the statement(s):

I have read and understood the information sheet 29.07.20, Version 1 and have had the opportunity to ask questions about the study.	
I agree for my school to take part in this research project and agree for my school's data to be used for the purpose of this study.	
I understand my participation is voluntary and I may withdraw until a week after data collection for any reason without my school's participation rights being affected.	

Name of headteacher (print name)…………………………………………………………………………………..

Signature of headteacher ……………………………………………………………………………………………

Date……

Name of researcher (print name)…………………………………………………………………………………..

Signature of researcher ……………………………………………………………………………………………

Date……..

Appendix O   Focus Group Script

Focus group briefing script

Hello everyone, my name is [researcher name]. I'm training to be an Educational Psychologist and my role involves working with children like all of you and their teachers, in lots of different schools. My job is to understand what children think about school and how they learn best. I am also a researcher. I am interested in how children like you feel about themselves and how they feel about school. Today I am going to ask you to help me by having a look at a new questionnaire I have made, to see if it makes sense. Your ideas will help me make it better before I use it in my research with children. First, you can have a look at it, and I will read the questions to you. Then I will ask you some questions to see what you think. I will write down your ideas but I will not use your name. If you don't want to join in, you can leave at any time. Just let me know, and you don't have to give a reason why, and you will not be in trouble. Does that make sense?

The questionnaire is all about being thankful. I will read it to you now. You do not have to answer the questions, but you can write anything down if you want to. While I am reading, listen and see if you think the questions make sense. You can stop me at any time if something doesn't make sense, or if there is something else you would like to tell me. I will stop after each question to see what you think. [Hand out copies for the children and read the questions out loud].

Question prompts:

Are there any words you don't understand?

Is it clear where children should write their answers?

Is it clear what they need to write?

How would you answer this question?

Can you give an example? (e.g. a time I stop each day to be thankful)

Is there anything else you think needs to be changed to make the question easier for children to answer?

Thank you for helping me with my research today. Your feedback will help me make this questionnaire easier for children to use when I am doing my research. [Hand out thank you post-cards]. Is there anything you want to ask or anything else you want to tell me?

Appendix P   Parent Information Sheet, Consent, Assent and Debrief (Online Form)

Parent Information Sheet

Study Title: Developing a questionnaire to measure children's gratitude.
Researcher: Sophie Smith
ERGO number: 60736.A3

Your child is being invited to take part in the above research study. To help you decide whether you would like them to take part or not, it is important that you understand why the research is being done and what it will involve. Please read the information below carefully and ask questions if anything is not clear or you would like more information before you decide to take part in this research. You may like to discuss it with others but it is up to you to decide whether or not you would like your child to take part. If you are happy for them to take part, please tick the consent box at the bottom of this form. Please also ask your child if they are happy to complete the questionnaire, and ask them to tick the box called 'child permission'.

What is the research about?
My name is Sophie Smith and I am training to be an Educational Psychologist at the University of Southampton. This project is part of my Doctorate in Educational Psychology qualification. I am also on a placement with a local authority educational psychology service, where I work with parents and school staff to help improve outcomes for children and young people. One way we do this is using Positive Psychology, which focuses on building on individuals' strengths and things that are already working well for them. Gratitude diaries are a Positive Psychology intervention which encourage people to note down several things they are grateful for or that they have appreciated that day. Some initial research links gratitude diaries to positive outcomes such as well-being, and children's sense of belonging in school. It is helpful to have a suitable way of measuring children's gratitude, to see if this type of intervention does result in changes to children's reported gratitude. At the moment, most research is using a measure which was designed for adults, and only has six questions. I have designed a new measure of gratitude which is aimed specifically at children and may allow us to detect more subtle differences in gratitude than this existing measure. I also want to find out how my new questionnaire compares with the existing measure, in terms of how children score on each one. It is my hope that this new questionnaire will be used by researchers studying children's gratitude in future work. I will also be asking some children and teachers to have a look at the

questions to see if they are appropriately worded for year 4 and 5 children to read and answer independently.

Why has my child been asked to participate?
Your child has been asked to take part in this study, as I am looking for year 4 and 5 children to test out my new questionnaire.

What will happen to my child if they take part?
They will complete two online questionnaires, ticking the box to indicate their responses. There is nothing else they need to do. Please feel free to read the questions aloud to your child but let them choose their own responses. Part of the study is to find out whether children can complete it independently. It is also important that they give an honest answer, without worrying about what their parent or carer might think.

Are there any benefits in my child taking part?
All 70 Amazon vouchers have now been claimed. There are no direct benefits to your child from taking part, however we appreciate their participation, as this study will help our understanding of children's gratitude

Are there any risks involved?
This study does not involve any risks to your child.

What data will be collected?
You will be asked to provide some demographic information (e.g. the child's age and gender) as part of the online form. This is so we can provide the average age and gender distribution in the write up of our study. You will not be asked to give your, or your child's name, to ensure all data is anonymous.

Will my child's participation be confidential?
Your child's completion of these questionnaires will be kept strictly confidential. Only members of the research team and responsible members of the University of Southampton may be given access to anonymised data collected for monitoring purposes and/or to carry out an audit of the study to ensure that the research is complying with applicable regulations. Individuals from regulatory authorities (people who check that we are carrying out the study correctly) may require access also to this data. All of these people have a duty to keep information strictly confidential. Any electronic data, (e.g. excel spreadsheets) will be stored on a secure, password protected laptop, and will only be accessible by the researcher and university research supervisors.

Does my child have to take part?

No, it is entirely up to you and your child to decide whether or not they take part. If you decide you want to take part, please continue with the questionnaire, and tick the consent box. If you do not want your child to take part, please close the link and do not ask them to complete the questionnaires.

What happens if I change my mind?
You can exit the questionnaire at any time. Once your child has submitted their answers, it will not be possible to change or withdraw them.

What will happen to the results of the research?
Your child's personal details will remain strictly confidential. Research findings made available in any reports or publications will not include information that can directly identify your child. The results will be analysed and written up as part of the researcher's doctoral thesis project. This write-up will be available from the university's 'ePrints' website (eprints.soton.ac.uk) one year following its final submission; also, it might be published on the university's course blog (blog.soton.ac.uk/edpsych/) or submitted for publication in a peer reviewed journal. The results will also be shared with your child's school and a sheet explaining the results for parents/carers and the children will be provided.

Where can I get more information?
If you would like more information about this study, you can contact the researcher or research supervisors by email using the details below.

Sophie Smith (Researcher): s.o.smith@soton.ac.uk

Colin Woodcock (Supervisor): c.woodcock@soton.ac.uk

Catherine Brignell (Supervisor): c.brignell@soton.ac.uk

What happens if there is a problem?
If you have a concern about any aspect of this study, you should speak to the researchers who will do their best to answer your questions. You can use the contact details provided above.
If you remain unhappy or have a complaint about any aspect of this study, please contact the University of Southampton Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk).

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For the purposes of data protection law, the University of Southampton is the 'Data Controller' for this study, which means that we are responsible for looking after your information and using it properly. The University of Southampton will keep identifiable information about you for 10 years after the study has finished after which time any link between you and your information will be removed.

To safeguard your rights, we will use the minimum personal data necessary to achieve our research study objectives. Your data protection rights – such as to access, change, or
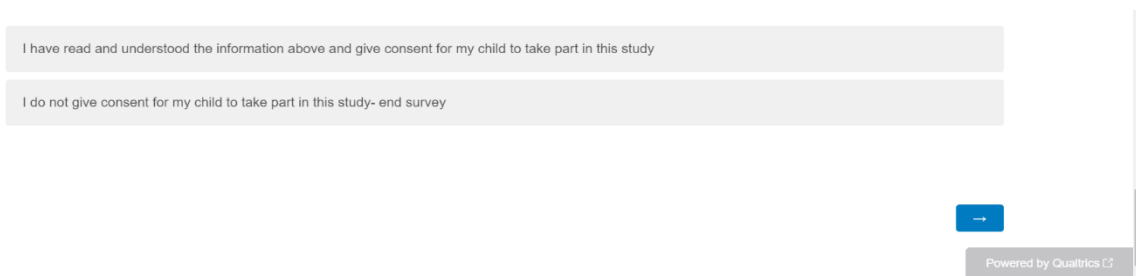
transfer such information - may be limited, however, in order for the research output to be reliable and accurate. The University will not do anything with your personal data that you would not reasonably expect.

If you have any questions about how your personal data is used, or wish to exercise any of your rights, please consult the University's data protection webpage (https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page) where you can make a request using our online form. If you need further assistance, please contact the University's Data Protection Officer (data.protection@soton.ac.uk).

Thank you.

Thank you for taking the time to read the information sheet and considering taking part in the research.

Instructions:

- Please ask your child to answer the following questions as best as they can.
- You may help them with reading the questions, but please let them choose their own answers.
- If your child does not want to participate, you can stop the survey at any time by closing the window, and their answers will not be saved.
- Please note: your child cannot withdraw their answers once the online questionnaire is completed and submitted.
- If your child becomes upset at any point during the completion of these questions, please provide them with emotional support in the way you would usually do.

Thank you!

Please discuss the study with your child and ask them to choose an option below.

I am happy to take part.

I do not want to take part.

← →

Powered by Qualtrics ☐

Survey Completion

Thank you for completing the survey. Your answers have been submitted. They will help us to test out a new questionnaire we have made about children's gratitude and thankfulness. You can now close the page when you are ready.

Debriefing statement

The aim of this research was to test out a new questionnaire for measuring children's gratitude. It is expected that children's answers will be related to their answers on a questionnaire that already exists, the GQ-6. Your data will help our understanding of the usefulness of our new questionnaire measure. Once again results of this study will not include you or your child's name or any other identifying characteristics. The research did not use deception. You may have a copy of this summary if you wish. You may also have a summary of the findings once the project is finished. Please email me if you would like either of these.

If you have any further questions please contact me, Sophie Smith at s.o.smith@soton.ac.uk.

Thank you for your participation in this research.

If you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the University of Southampton Head of Research Integrity and Governance (023 8059 5058, rgoinfo@soton.ac.uk).

Appendix Q   Gratitude Questionnaire Six-Item Form (GQ-6)

The Gratitude Questionnaire-Six Item Form (GQ-6)

 By Michael E. McCullough, Ph.D., Robert A. Emmons, Ph.D., Jo-Ann Tsang, Ph.D.

Using the scale below as a guide, write a number beside each statement to indicate how much you agree with it.

1 = strongly disagree

2 = disagree

3 = slightly disagree

4 = neutral

5 = slightly agree

6 = agree

7 = strongly agree

1. I have so much in life to be thankful for. _____

2. If I had to list everything that I felt grateful for, it would be a very long list. _____

3. When I look at the world, I don't see much to be grateful for. _____

4. I am grateful to a wide variety of people. _____

5. As I get older I find myself more able to appreciate the people, events, and situations that have been part of my life history. _____

6. Long amounts of time can go by before I feel grateful to something or someone. _____

Appendix R   Questionnaire of Appreciation in Youth (QUAY; survey version)

For each sentence below, please tick an answer to show how often each statement is true for you.

		Never	Not very often	Sometimes	Very often	Always
1	I can easily think of lots of things I am thankful for.					
2	People help and support me.					
3	I have lots of things in my life to be thankful for.					
4	Simple things can make me happy.					
5	I feel jealous of other children.*					
6	Small good things can happen, even on a bad day.					
7	I am a grateful person.					
8	I can think about the things I am grateful for to cheer me up if I am feeling sad.					
9	I am so lucky compared to some other children.					
10	If someone does something kind for me, I will do something kind back.					
11	I feel happy to have the life that I have.					
12	I look around and feel amazed by the things I see.					

		Never	Not very often	Sometimes	Very often	Always
13	There are lots of things I would like to change about my life.*					
14	It is important to say 'thank you' if someone does something nice for you.					
15	Other people give up their time to help me.					
16	The best things in life are expensive presents.*					
17	I think about good things that have happened to me in the past.					
18	My friends and I do kind things for each other.					
19	When something good is happening, I try to enjoy it as much as I can.					
20	People around me want me to have a happy life.					
21	I feel more thankful when someone does something for me if it has taken them a lot of effort.					
22	It takes me a long time to feel better after something annoys me.*					
23	I like being thankful.					
24	Taking time to be thankful is something I try to do each day.					
25	I notice when good things happen in my day.					
26	I feel happy if someone does a kind thing for me.					

		Never	Not very often	Sometimes	Very often	Always
27	I remind myself to be thankful.					

* = reverse scored

	Never	Not very often	Sometimes	Very often	Always

Appendix S   Study Advertisements

"Hello, my name is Sophie Smith and I am a trainee educational psychologist at the University of Southampton. I am currently looking for parents and children to help me with some research I am doing as part of my training. Please could you take a moment to have a look at the poster below and consider whether you are able to help. Thanks and best wishes, Sophie

Link to the survey: [link]"

Appendix S

'Word version' of website post (when unable to share poster image)

"Are you the parent or guardian of a child in Year 4 or 5?

Would you like to help with research about children's gratitude?

My name is Sophie Smith and I am a trainee educational psychologist at the University of Southampton. I am looking for parents to support their child to complete an online questionnaire about gratitude and thankfulness. If you could help, please click the link to find out more and to access the questionnaire.

ERGO number: 60736.A3

Researcher: Sophie Smith (sos1n18@soton.ac.uk)

Link to the survey: [link]

Appendix T   Descriptive Statistics for QUAY Scores by Group

Group	Whole scale			Gratitude			Sense of privilege			Appreciation		
	n	*M (SD)*	*Range*	*n*	*M (SD)*	*Range*	*n*	*M (SD)*	*Range*	*n*	*M (SD)*	*Range*
Age 8 years	29	25.09 (3.10)	15.67 - 30	29	26.97 (3.42)	17 - 30	29	25.14 (4.20)	15 - 30	29	23.17 (4.02)	14 - 30
Age 9 years	55	23.04 (3.23)	15.67 - 30	56	26.77 (3.40)	17 - 30	57	23.74 (5.24)	12 - 30	56	21.89 (3.97)	14- 30
Age 10 years	21	23.76 (3.16)	19 – 29.33	21	25.86 (3.53)	18 - 30	21	24.00 (4.02)	18 - 30	21	21.43 (3.70)	14- 28
Boys	65	24.09 (3.15)	15.67 - 30	66	26.29 (3.50)	17 - 30	67	24.09 (4.64)	12 - 30	66	22.12 (4.04)	14 - 30
Girls	40	24.58 (3.29)	15.67 - 30	40	27.23 (3.25)	17 - 30	40	24.30 (4.98)	12 - 30	40	22.20 (3.84)	14 - 30
Whole sample	105	24.27 (3.20)	15.67 - 30	106	26.64 (3.42)	17 - 30	107	24.17 (4.75)	12 -30	106	22.15 (3.95)	14 - 30

Note. Descriptive statistics are calculated from scaled scores.

Appendix U   Group Comparisons

Group	Multivariate test	Test statistic	F	df	p	$\eta p2$
Age	Pillai's Trace	.070	1.188	6, 196	.314	.035
	Wilks' Lambda	.931	1.176	6, 194	.321	.035
	Hotelling's Trace	.073	1.164	6, 192	.327	.035
	Roy's Largest Root	.041	1.340	3, 98	.266	.039
Gender	Pillai's Trace	.054	1.853	3, 97	.143	.054
	Wilks' Lambda	.946	1.853	3, 97	.143	.054
	Hotelling's Trace	.057	1.853	3, 97	.143	.054
	Roy's Largest Root	.057	1.853	3, 97	.143	.054
Age * Gender	Pillai's Trace	.041	.681	6, 196	.665	.020
	Wilks' Lambda	.959	.680	6, 194	.666	.021
	Hotelling's Trace	.042	.679	6, 192	.667	.021
	Roy's Largest Root	.041	1.333	3, 98	.268	.039

Group	Subscale	F	df	p	$\eta p2$
Age [a]	Gratitude	1.537	2, 99	.220	.030
	Privilege	1.368	2, 99	.259	.027
	Appreciation	1.492	2, 99	.230	.029
Gender [b]	Gratitude	4.806	1, 99	.031*	.046
	Privilege	.639	1, 99	.426	.006

	Appreciation	.196	1, 99	.659	.002
Age * Gender[c]	Gratitude	1.549	2, 99	.217	.030
	Privilege	1.186	2, 99	.310	.023
	Appreciation	.342	2, 99	.711	.007

[a] *R Squared = .072 (Adjusted R Squared = .025).*

[b] *R Squared = .046 (Adjusted R Squared = -.003).*

[c] *R Squared = .035 (Adjusted R Squared = -.014).*

* = significant at p < .05.

Appendix V   QUAY Form and Scoring

The Questionnaire of Appreciation in Youth (QUAY)

Smith, Woodcock & Brignell (2021)

<u>Purpose of the QUAY</u>

The QUAY has two key purposes:

- To identify children who report lower than average levels of trait gratitude, only for the purpose of including them in targeted interventions to increase their level of trait gratitude, so that they may benefit from increased subjective psychological well-being and/or life satisfaction
- To measure a child's trait gratitude before and after participation in a gratitude intervention, to evaluate the impact of the intervention on their level of trait gratitude

As such, the QUAY should never be used to:

- Penalise or shame children with lower levels of trait gratitude, including labelling them as 'ungrateful'
- Rank or compare individual children based on their level of trait gratitude

<u>Administration guidelines</u>

- The QUAY form should be completed by the child in a quiet space with minimal distractions
- An adult may help the child to read the questionnaire but should not attempt to influence their responses in any way. If possible, after reading the item, the adult should look away and sit back slightly to reassure the child that they are not observing or judging their responses

<u>Scoring instructions</u>

1. Use the following key to assign a numerical value to each item answer from the questionnaire.

Response	Score
Never	1
Not very often	2
Sometimes	3

Very often	4
Always	5

2. Use the scoring template to write the value for each answer in the white (unshaded) box below the item number, so that it corresponds to the relevant scale down the left-hand side of the template.

3. Do not include the score for item 8 but do consider disregarding the responses if the child has given an answer other than 1 (*never)* for this item.

4. Add together the item totals to give a sum for each subscale and write these in the column labelled *sum*.

5. Multiply the number shown in the column labelled *x by* to give a scaled score for each subscale.

6. Add the subscale totals and divide by three to give a scaled score for the full-scale in the box in the bottom right-hand corner.

	1	2	3	4	5	6	7	8	9	10	11	12	Sum	x by	Total	
Gratitude								Concentration check question						x1 =		
Appreciation														x2 =		
Sense of privilege														x3 =		
													QUAY total		/3	

		Never	Not very often	Sometimes	Very often	Always
Questionnaire of Appreciation in Youth (QUAY)						
Instructions: Tick a box to say how often each sentence is true for you.						
1	I have lots of things in my life to be thankful for					
2	Small good things can happen, even on a bad day					
3	I am so lucky compared to some other children					
4	If someone does a kind thing for me, I will do something kind back					
5	I feel happy to have the life that I have					
6	I look around and feel amazed by the things I see					
7	Other people give up their time to help me					
8	Let's check you are still reading carefully. How often do you visit the moon?					
9	I think about good things that have happened to me in the past					
10	When something good is happening, I try to enjoy it as much as I can					
11	I like being thankful					
12	I feel happy if someone does a kind thing for me					

Glossary of Terms

See Definitions and Abbreviations and Appendix G: Definitions of study mediators.

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