



# Using a Trans-theoretical Approach to Identify Differences in Determinants of Anxiety and Depression Symptoms and Mental Wellbeing Between Two Age Groups

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Accepted: 10 September 2023  
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## Abstract

The objective of this research was to compare social, emotional, and cognitive determinants of depression and anxiety symptoms and mental wellbeing using the two-continua model of mental health and illness in two age groups. The two-continua model proposes that mental health and mental illness are not two ends of the *same* spectrum but are, in fact, two *separate* but related spectrums. This cross-sectional study used a multi-age group comparison approach to identify the relative predictive strengths of risk and protective factors for the two-continua model of mental health and mental illness. Participants ( $n=458$ : 251 16–25 year olds, and 207 35–64 year olds) completed an online survey that measured the outcome variables of depression and anxiety symptoms and mental wellbeing. Independent variables from three conceptual areas in psychology—(1) positive psychology: optimism, pessimism, and accomplishment; (2) emotion regulation: cognitive reappraisal and expressive suppression; and (3) interpersonal theories: belonging and relationship with parent/child—were measured to ascertain the determinants of these outcome variables. The all-variables models explained 58–68% of the variance in depression symptoms, 77–80% in mental wellbeing, and 26–43% in anxiety symptoms. For both groups, the strongest predictor of mental wellbeing in these models was accomplishment. The strongest predictors in these models of mental illness symptoms differed between groups: belonging in the younger group and accomplishment in the older group. Programs targeting belonging and accomplishment could be highly effective in promoting mental wellbeing and reducing mental ill-health for these groups. Interventions require contextual investigation to locate drivers of mental wellbeing and illness for different age groups prior to implementation.

**Keywords** Mental health · Mental wellbeing · Belonging · Accomplishment · Risk factors · Protective factors

Given the high and rising prevalence and subsequent high burden of depression and anxiety disorders in Australia, there is an imperative to better understand the cognitive, social, and emotional determinants of these disorders. Specifically, it is well documented that Australians in the 16–25-year age group have a higher prevalence of depression and

anxiety disorders than adults in their 40 s and 50 s (Australian Bureau of Statistics, 2008, 2022). Many studies have investigated factors contributing to depression and anxiety symptoms, as well as mental wellbeing (Lieneck et al., 2021; Liu et al., 2019; Ryff, 2014; World Health Organization, 2004); however, few have considered how the contribution

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of these factors may vary between different age groups and life stages in adult samples. Adults in their 40 s and 50 s are an often-missed group in psychological research, which tends to have an overreliance on easily accessible populations such as undergraduate students (Rad et al., 2018; Wintre, 2001). A small number of studies, such as those conducted by Berry and Rogers (2003), Burns et al. (2010), and Windsor and Anstey (2010) have investigated differences in the risk and protective factors for (predictors of) mental wellbeing in different age groups. This is an important area for further study as these early findings call into question the generalizability of research findings from youth populations, such as undergraduate students, to progressively older adult age groups.

Mental wellbeing is now widely recognized as more than simply an absence of mental illness (World Health Organization, 2004). Traditionally, psychological theories have focused on the treatment of mental ill-health without considering the importance of taking into account the mental wellbeing continuum, a construct demonstrably different from mental illness (Maddux, 2008). This study engaged a conceptual paradigm that specifically sought to include considerations of mental wellbeing as conceptualized in the two-continua model of mental health, as well as the mental ill-health conditions of anxiety and depression. Instead of a single continuum from mental illness to mental wellbeing, the two-continua model of mental health argues that there are two separate but closely related continua: the mental illness spectrum and the mental wellbeing spectrum. Keyes and Simoes (2012) define subjective mental wellbeing on its own continuum as consisting of both hedonic (positive feelings) and eudaimonic (positive functioning) components, ranging from flourishing to languishing. The definition and components of mental wellbeing are not yet settled in the literature. Keyes' (2002) model of mental wellbeing was selected for this study given it is the most independently comprehensive model of mental wellbeing, incorporating Ryff's (2014) mental wellbeing as well as addressing the positive emotion and relationship elements of Seligman's (2011) PERMA model.

Social, emotional, and cognitive variables were selected from three psychological theories—interpersonal theories, emotion regulation theory, and positive psychology—with the aim of identifying predictive variables for mental wellbeing and illness outcomes in these two age groups. A growing body of theoretical and empirical evidence from the interpersonal body of literature in psychological research has confirmed the fundamental importance of *belonging* as a driver of human behavior and as a large proximal predictor of mental illness and wellbeing (Bartolo, 2019; Cockshaw et al., 2014; Moeller et al., 2020; Shochet et al., 2011). For example, Parr et al.'s (2020) study demonstrates the strength of the relationship between belongingness and depression. As such, belonging

was chosen from this theoretical body as a core independent variable being tested as a predictor for mental ill-health and mental wellbeing in both groups. Additionally, relationship with parent (younger age group) and relationship with child (older age group) were selected from interpersonal theories (Hagerty et al., 1992, 1996; Umberson, 1992). Cognitive reappraisal and expressive suppression were selected as potentially important variables from emotion regulation theory (Gross & John, 2003; Moore et al., 2008), while optimism, counterfoil pessimism, and sense of accomplishment were selected from positive psychology (Bang & Reio, 2017; Bianchi et al., 2015; Carver et al., 2010; Seligman, 2011). These positive psychology variables are not represented in Keyes' (2012) mental wellbeing model and, therefore, have been considered independent variables, not components of wellbeing.

While there is literature demonstrating that emotional regulation per se is not as developed in teens and young adults as it is in older age groups, and that younger people acquire and rely on wider-reaching more comprehensive social networks than they do as they get older, the additional constructs selected as potential contributors to mental wellbeing in this study are less researched across these two age groups (Charles & Carstensen, 2010; Zimmerman & Iwanski, 2014). Thus, while the overarching domains of some of the selected constructs have certainly been proven to differ over the lifecourse (Baltes et al., 1999), there are gaps in the literature on age-related differences in variables such as optimism. From a developmental psychology perspective, the importance of these variables for an individual may be expected to differ with developmental phase; for instance, belongingness may be most important in early- and late-life phases (Luhmann & Hawkey, 2016), with other variables taking priority in the middle adulthood years. There is limited research on whether there any differences in the relationships between these constructs and mental wellbeing based on age or developmental stage.

As such, this cross-sectional study aimed to address knowledge gaps in the existing research on the two-continua model of mental health by addressing two questions. First, we investigated risk and predictive factors (potential predictor variables) of the two continua of mental health from selected positive psychology, emotion regulation, and interpersonal theory variables in two age groups. Second, we identified similarities and differences between these potential predictors of the two continua of mental health in these age groups.

## Methods

In this Australian cross-sectional study, we measured levels of depression symptoms, anxiety symptoms, and mental wellbeing using a 15-min online, anonymous,

self-report survey between March and November 2017. Recruitment of participants was primarily via paid social media advertisements. Additional recruitment methods were a university media release and news story, presentations at lectures, a university for-credit program for psychology and counseling students, and circulation of the study via email networks.

Participants were aged 16–25 years or parents of young people aged 16–25 years (mostly aged between 40 and 60). The 16–25 year age group was selected to represent the eligibility criteria for many Australian youth mental health services such as Headspace (12–25 years). The lower cut-off was 16 years due to ethical considerations related to provision of informed consent. Persons under 18 years of age are arguably pre-adulthood, and therefore, in this study, the younger age group has been included as a comparison group to the older adult group, as opposed to an adult age group per se. No age restriction was placed on the older group. Participation was anonymous, and it is not possible to know whether there were any familial relationships between participants in these two groups. Participants were all living in Australia at the time of the study. The outcome variables measured were depression and anxiety symptoms (Depression, Anxiety, and Stress Scale (DASS—21); Lovibond & Lovibond, 1995), and mental wellbeing (Mental Health Continuum—Short Form; Keyes, 2005). The potential predictor variables were demographic variables, cognitive reappraisal, and expressive suppression (Emotion Regulation Questionnaire (ERQ); Gross & John, 2003), optimism, and pessimism (Life Orientation Test (Revised) (LOT-R); Vautier et al., 2003), accomplishment (single-question measure that has been used previously with good predictive validity; Burke et al., 2014), belonging (modified version of the Sense of Belonging Instrument (SOBI-P) with question 12, “If I died tomorrow, very few people would come to my funeral,” removed as it was deemed unsuitable for adolescents; Hagerty & Patusky, 1995), and relationship with parent/child (Positive Relationship with Parents Scale; Child Trends, 2013). Additional information about these measurement tools is presented in Table 1.

Pearson’s correlation and multiple linear regression analyses were performed for each outcome variable in each group, using all independent variables and demographic variables. Correlation and regression analyses were performed using IBM SPSS Statistics 21. Little’s test indicated data were missing completely at random ( $\chi^2[221, N = 10] = 246.572, p = 0.114$ ). There was less than 3% missing data for any psychology scale question in either group. The expectation maximization technique for missing value imputation was used for all psychological variables.

## Participant Analytics

A total of 621 participants (51.2% of the 1208 people who clicked on the survey link) completed the survey. Participants with substantial missing data or whose responses indicated that they were ineligible to participate ( $n = 13$ ) were removed. The 150 participants with linked family members were allocated to a separate family study, and the remaining participants were allocated to this study. The final number of participants was 458: 251 in the 16–25 year age group and 207 in the older age group, aged 35–64 years, mostly in their 40 s and 50 s. The majority of participants were female (81.67% younger; 95.65% older). The average age of the younger group was 19.16 ( $SD = 2.627$ ), and the average age of the older group was 50.90 ( $SD = 5.189$ ) at the time of the study in 2017. The socio-economic distribution (SEIFA) deciles were distributed across the ten socio-economic levels ( $\chi^2 [10, N = 193] = 16.275, p = 0.061$ ) in the older group but were significantly skewed toward the higher SEIFA deciles ( $\chi^2 [10, N = 240] = 132.917, p < 0.001$ ) in the younger group (Australian Bureau of Statistics, 2013). Based on the Australian Government Department of Health Rural, Remote and Metropolitan Area Classification (Australian Government, 2020), the participant distribution in both groups was not significantly different to the Australian population distribution (younger:  $\chi^2 [4, N = 240] = 5.35, p = 0.148$ ; older:  $\chi^2 [4, N = 196] = 7.65, p = 0.054$ ). A total of 57.49% of the older group reported having a university-level education (bachelor or postgraduate degree). This is substantially higher than the Australian average of 24% (Australian Bureau of Statistics, 2017). The majority of participants in both groups (76.10% younger,  $n = 191$ ; 70.05% older,  $n = 145$ ) identified their ethnicity as Australian. The distribution of reported ethnicities other than Australian was broad, with no other large groups represented. Therefore, in the analyses below, we have compared Australian participants with all participants who did not identify themselves as Australian.

## Results

Descriptive statistics for all predictor and outcome variables are presented in Table 2 and in supplementary material. For all variables, means were significantly and substantially different between younger and older groups. All aspects of mental health were poorer for the younger group.

Correlations between each predictor variable and each outcome variable are presented in Table 3. Strong correlations were identified between mental wellbeing and accomplishment in both age groups ( $r = 0.80^{**}$  younger; and  $r = 0.84^{**}$  older). Weak correlations were identified between socio-economic status and mental health in the younger but not the older group. In the older group, there was a weak

**Table 1** Psychological variables and measurement tools

Variable	Measurement tool	Example question	Questions (Score Range)	Alpha coefficient
Depressive symptoms	Depression, Anxiety, and Stress Scale (DASS—21)	“I felt down-hearted and blue”	7 (0–21)	Young = .93 Older = .89
Anxiety symptoms	Depression, Anxiety, and Stress Scale (DASS—21)	“I found myself getting agitated”	7 (0–21)	Young = .90 Older = .85
Mental wellbeing	Mental health continuum – Short Form	Please answer how many times in the past month you have felt: “Satisfied with life”	14 (0–70)	Young = .93 Older = .94
Cognitive reappraisal	Emotion Regulation Questionnaire (ERQ)	“I control my emotions by changing the way I think about the situation I’m in”	6 (6–42)	Young = .91 Older = .90
Expressive suppression	Emotion Regulation Questionnaire (ERQ)	“I control my emotions by not expressing them”	4 (4–28)	Young = .74 Older = .81
Optimism	Life Orientation Test (Revised) (LOT-R)	“Overall I expect more good things to happen to me than bad”	3 (3–15)	Young = .69 Older = .78
Pessimism	Life Orientation Test (Revised) (LOT-R)	“If something can go wrong for me it will”	3 (3–15)	Young = .79 Older = .80
Accomplishment	Single question measure. (Single question measures have been used previously with good predictive validity for accomplishment)	Please answer how many times in the past month you have felt: “A sense of accomplishment” Using a six-point Likert scale from never to every day	1 (0–5)	
Belonging	Modified version of the sense of belonging instrument (SOBI-P)	“I generally feel that people accept me” A modified 17 question version of this questionnaire was used. The question “If I died tomorrow very few people would come to my funeral” was deemed by the researchers to be unsuitable for participants under 18 years of age	17 (17–68)	Young = .94 Older = .95
Relationship with parent	Positive relationship with parents scale	“I count on my father/ mother to be there when I need him/her”	6 (0–24)	Young = .93 Older = .82
Relationship with child	Positive relationship with parents scale	“My child can count on me to be there when he/she needs me”	7 (0–28)	Young = .93 Older = .82

**Table 2** Mean scores for each predictor and outcome variable in each age group

	Younger		Older		<i>t</i>	<i>df</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Depression	9.50	6.14	4.47	4.15	10.06*	456	0.94
Anxiety	9.06	5.86	3.61	3.80	11.55*	456	1.08
Mental wellbeing	35.13	14.69	48.01	13.58	− 9.67*	456	− 0.91
Optimism	8.69	2.75	11.56	2.69	− 11.24*	456	− 1.05
Pessimism	9.59	2.96	6.66	2.75	10.85*	456	1.02
Belonging	43.36	10.95	53.19	10.08	− 9.92*	456	− 0.93
Accomplishment	2.34	1.44	3.33	1.41	− 7.43*	456	− 0.70
Cognitive reappraisal	25.50	8.16	31.04	7.31	− 7.59*	456	− 0.71
Expressive suppression	17.07	5.30	13.78	5.45	6.52*	456	0.61

All scales scored such that higher scores correspond to higher levels of the construct being measured

\* $p < .001$

correlation between education level and mental wellbeing. Mental health scores for each age group and each demographic variable are presented in Supplementary Table A.

The all-variables models (Table 4), which incorporate predictors from all theories, explained a greater proportion of each outcome variable than could be achieved by

**Table 3** Correlations between predictor and outcome variables for two age groups

		Dep	Anx	MW	Opt	Pess	Bel	Accom	Reapp	Supp	Rel
Depression (Dep)	<i>r</i>	–	.654**	–.758**	–.574**	.535**	–.753**	–.650**	–.480**	.326**	–.384**
	<i>n</i>		249	249	250	250	250	250	250	250	250
Anxiety (Anx)	<i>r</i>	.624**	–	–.525**	–.387**	.446**	–.585**	–.419**	–.318**	.210**	–.249**
	<i>n</i>	207		249	250	250	250	250	250	250	250
Mental Wellbeing (MW)	<i>r</i>	–.723**	–.461**	–	.604**	–.539**	.723**	.803**	.470**	–.329**	.383**
	<i>n</i>	207	207		250	250	250	250	250	250	250
Optimism (Opt)	<i>r</i>	–.563**	–.303**	.598**	–	–.510**	.582**	.596**	.504**	–.189**	–.342**
	<i>n</i>	207	207	207		251	251	251	251	251	251
Pessimism (Pess)	<i>r</i>	.537**	.375**	–.601**	–.554**	–	–.556**	–.432**	–.322**	.314**	–.320**
	<i>n</i>	207	207	207	207		251	251	251	251	251
Belonging (Bel)	<i>r</i>	–.629**	–.399**	.677**	.566**	–.512**	–	.565**	.532**	–.273**	–.487**
	<i>n</i>	207	207	207	207	207		251	251	251	251
Accomplishment (Acc)	<i>r</i>	–.675**	–.412**	.834**	.502**	–.509**	.582**	–	.427**	–.284**	.286**
	<i>n</i>	206	206	206	206	206	206		251	251	251
Cognitive Reappraisal (Reapp)	<i>r</i>	–.333**	–.245**	.367**	.426**	–.291**	.340**	.250**	–	–.019	–.319**
	<i>n</i>	204	204	204	204	204	204	203		251	251
Expressive Suppression (Supp)	<i>r</i>	.350**	.311**	–.386**	–.213**	.347**	–.359**	–.321**	–.043	–	.215**
	<i>n</i>	206	206	206	206	206	206	205	204		251
Parent–Child relationship (Rel)	<i>r</i>	–.317**	–.169*	.312**	.237**	–.211**	.290**	–.271**	.191**	–.106	–
	<i>n</i>	206	206	206	206	206	206	205	203	205	

Younger group above diagonal; Older group below diagonal

\* $p < .05$ , \*\* $p < .01$

limiting predictors to a specific theoretical orientation. The all-variables regression models explained the majority of the variance in depression symptoms (younger 68%; older

58%), mental wellbeing (younger 77%; older 80%), and a substantial proportion of the variance in anxiety symptoms (younger 43%; older 26%). For depression symptoms and

**Table 4** Regression analyses of mental health risk and protective factors in both groups

	Younger ( $n = 251$ )			Older ( $n = 207$ )		
	Depression	Anxiety	Mental wellbeing	Depression	Anxiety	Mental wellbeing
$R^2$	.68**	.43**	.77**	.58**	.26**	.80**
Adjusted $R^2$	.66	.40	.76	.55	.21	.78
Standardized coefficient $\beta$						
Gender	–.05	–.06	.03	.03	–.11	–.03
Socioeconomic status	–.01	–.11*	.07*	.01	.06	.00
Ethnicity	.01	.012	.02	–.01	.07	–.02
Education level	–.03	–.09	–.02	.08	.04	.04
Location type	–.05	–.05	.04	.04	.11	.09*
Cognitive reappraisal	–.06	–.01	.01	–.02	–.06	.08
Expressive suppression	.09*	.00	–.06	.08	.15*	–.07
Optimism	–.05	–.06	.02	–.10	–.00	.10*
Pessimism	.10	.19**	–.09*	.14*	.14	–.09*
Accomplishment	–.26**	–.07	.56**	–.41**	–.19*	.63**
Belonging	–.49**	–.51**	.31**	–.21**	–.14	.11*
Relationship with parents	.02	.04	.02	N/A	N/A	N/A
Relationship with child	N/A	N/A	N/A	–.06	–.03	.02

\* $p < .05$ , \*\* $p < .01$

mental wellbeing models, accomplishment and belonging were the strongest predictors in both groups. In the presence of belonging and accomplishment, many of the predictors did not have significant relationships with the outcome variables. The predictors of anxiety differed between groups: belonging and pessimism in the younger group, and accomplishment and expressive suppression in the older group. As a follow-up analysis, between group differences in correlations between predictors (accomplishment and belonging) and outcomes (depression, anxiety and wellbeing) were examined. Significance tests were performed on the difference between Fisher  $z$ -transformed correlation coefficients for the two age groups. Significant differences were found for correlations between belongingness and depression,  $Z=2.54$ ,  $p=0.011$ , and belongingness and anxiety,  $Z=2.62$ ,  $p=0.009$ . In both cases, correlations were greater for the younger group.

## Discussion

The levels of depression and anxiety symptoms and mental wellbeing in these two age-specific groups found in this study, as well as the strength of correlations between each of the selected risk and protective factors and outcome variables as two-variable, linear relationships, align with the findings of previous research (Carver et al., 2010; Gross & John, 2003; Keyes, 2002; Keyes & Simoes, 2012; Parr et al., 2020). The contribution of this research is that it found that the *combination* of variables in the all-variables models from the three schools of psychological research (interpersonal theories, emotional regulation theories, and positive psychology) explained a majority of the variance in depression symptoms and mental wellbeing (58–80%), and a substantial proportion of the variance in anxiety symptoms (26–43%). Belonging and accomplishment emerged as having key relationships with all mental health outcomes, and, in the presence of belonging and accomplishment, many of the other variables had weak or nonsignificant relationships with mental wellbeing, depression, and anxiety. These are important findings, highlighting the need to take a multi-theory approach to best understand the predictors of mental wellbeing and mental illness.

Few studies to date have examined how one's sense of belonging and its salience in predicting mental health may differ between age groups. Further to this, few studies have investigated the relationship between accomplishment and mental health outside of organizational settings. The importance of accomplishment is well established in organizational psychology research as a component of "burnout syndrome" (e.g., Bianchi et al., 2015); however, the relationship between accomplishment and mental wellbeing per se is not yet well understood. Seligman (2011) proposed that

accomplishment is, in fact, a component of mental wellbeing; however, it is not represented in other mental wellbeing models, such as those proposed by Keyes (Keyes & Simoes, 2012) and Ryff (2014). Accomplishment appears to be a variable worthy of substantial further investigation in treatment, early intervention, and prevention spheres. Although a small number of previous studies have investigated age differences in mental health protective factors (Berry & Rodgers, 2003; Burns et al., 2010; Windsor & Anstey, 2010), these studies have been limited in scope or had methodological limitations. Replication is needed to identify whether the findings of this study are represented in other samples or are evident within large population studies.

## Age Differences

Although in these models both belonging and accomplishment were the strongest overall predictors of mental health in both groups, belonging had the strongest relationship with lower levels of mental illness outcomes for the younger group, and accomplishment had the strongest relationship with lower mental illness and mental wellbeing outcomes for all older age group models. These findings indicate that different interventions and health promotion approaches may be necessary for these age groups. However, in both groups, there was a particularly strong relationship between accomplishment and mental wellbeing, indicating that it is a key influence, regardless of age or life stage. These findings require replication and testing in the broader Australian context.

The age group differences that emerged in this study point to the need for a more contextualized approach to predicting and treating mental illness in different age groups in Australian adults. The significance of the findings is that they imply that different factors are important to adults in different stages of their lifecourse. The importance of belongingness and social connection in the younger group is such that it may be the greatest influence on their mental health.

## Implications for Theory, Practice, and Research

The identification of substantial differences in variable relationships between groups indicates that distinct strategies may be required for working with people from different age groups. Specifically, a blanket approach to mental health promotion, early intervention, and treatment regardless of age is neither appropriate nor effective. Given that in the presence of accomplishment and belonging in the all-variables models many other predictor variables included in the models had weak or nonsignificant relationships with the outcome variables, we propose that belonging or accomplishment or both may mediate the relationships between the outcome variables and other risk and protective factors

(cognitive reappraisal, expressive suppression, optimism, pessimism, and relationship with parent/child). This has significant implications for the focal points within therapeutic treatment options and care, including population-based interventions for the different age groups, as well as clear markers for where the focus needs to be in future research examining precursors and predicting variables in mental health and mental illness.

Further research with a broader range of age groups and longitudinal design is necessary to develop a fuller understanding of the differences between groups based on age or developmental stage. The high level of overlapping variance between depression and mental wellbeing is also of note, suggesting possible shared etiology. For clinicians and practitioners the findings in this study may point to new or re-ordered points of intervention and care for different groups depending on both their lifecourse developmental stages, and their social and cultural influences in the course of their life history. Importantly, it is the integration of three theoretical domains, and the proven identification of the salient constructs within them in their capacity to predict mental illness and wellbeing that holds usefulness for further research. An additional area for future research would be to consider how these results align with self-determination theory (Vansteenkiste et al., 2020), in particular basic psychological need theory, and how autonomy, competence and relatedness may map with belongingness and accomplishment. In summary, the research has highlighted the use of a new approach to theory to guide methodologies that have, in this case at least, been successful in eliciting variable relationships that appear to hold promise for both therapeutic and empirical efforts in future.

## Limitations

This exploratory study used a cross-sectional design; hence, no causality can be inferred from these results. Participants were mostly female (81.67% younger; 95.65% older), and most identified as being Australian (76.10% younger; 70.05% older). This reflects the findings of previous research that Caucasian females are more likely to participate in mental health and public health research than other groups (Ellis et al., 2014; Woodall et al., 2010) but impacts the generalizability of these results to other populations. The primary recruitment strategy of social media advertisements via a university's Facebook page is likely to also introduce sampling bias; therefore, these participants cannot be considered representative of any population, and replication in different samples is needed. Differences exist in the prevalence and presentation of depression and anxiety symptoms between genders and cultures; therefore, caution must be used in interpreting the study's findings.

This study also employed a relatively large number of risk and protective factors, required to span three theoretical approaches. Interactions with age group were not tested, as this would introduce eight additional predictor variables, increasing the chance of overfitting the model to these data and obscuring variance attributable to the primary predictors. The study should, therefore, be viewed as an initial investigation indicating likely benefit in integrating elements of interpersonal and positive psychology approaches, focusing on belongingness and accomplishment. Further research with this narrower focus should test interactions with age or life stage to confirm that differences are reliable across studies and samples. The study should, therefore, be viewed as an initial exploratory investigation indicating likely benefit in integrating elements of interpersonal and positive psychology approaches, focusing on belongingness and accomplishment.

While in the local Australian context, the age range 12–25 is considered to be “youth” for service provision purposes, we acknowledge that the definition of youth varies in the literature. Likewise, there is no consistent definition of the age range of middle adulthood. In this study, we have, therefore, simply referred to an older and younger age group. Another limitation of the present study is operationalisation of variables. Belonging, accomplishment, and mental wellbeing are often conflated, and this may be reflected in measurement models. Given that the present study suggests belonging and accomplishment as intervention targets, psychometric studies are required to ensure that they can be measured in ways that are separable both from each other and from key outcomes. Nevertheless, the variables are conceptually distinct. Mental wellbeing is a person's affective response to an aggregated impression of life conditions. This affective response is an outcome that clinicians hope to influence, but not directly tractable as an intervention target. Conversely, both belonging and accomplishment are feasible intervention targets as they directly concern aspects of social context and behavior that can be manipulated.

## Conclusions

We used an integrative, multi-theoretical approach within the two-continua model of mental health, and we suggest a new theoretical, conceptual basis for further research that may explain a large proportion of the variance in depression symptoms, mental wellbeing, and anxiety symptoms in two age groups. By including risk and protective factor variables from three schools of psychological thought and combining them to predict both mental illness and mental health, we located key drivers in both dimensions of the mental health continua model for two differently aged sets of Australian adults. Belonging and accomplishment emerged

as key variables in all models. Of all variables included in these models, belonging had the strongest relationship with mental illness for the younger group, and accomplishment had the strongest relationship with mental wellbeing in both groups, as well as mental illness symptoms for the older group. Opportunities exist for age-specific health promotion and intervention strategies for each group. Importantly, these protective factors can be employed to both sustain mental wellbeing and treat existing symptoms of depression and anxiety in unique ways. Further investigation of the relationships between belonging, accomplishment, and the two continua of mental health in other age groups is certainly warranted to determine whether further differences exist.

**Supplementary Information** The online version contains supplementary material available at <https://doi.org/10.1007/s10804-023-09465-4>.

**Acknowledgements** The authors would like to thank Queensland University of Technology's Centre for Justice who contributed to formatting and editing of this manuscript.

**Author Contributions** Research design was carried out by OF, JC, IC, and XH. Data collection was carried out by OF, JC, and IS. The data were analyzed by OF, JC, IS, and WC. The majority of the writing in the manuscript was done by OF, JC, and XH, with contributions from IS and WC. All authors read and approved the final manuscript.

**Funding** Open Access funding enabled and organized by CAUL and its Member Institutions. This study was conducted as part of Olivia Fisher's Doctorate of Philosophy degree and was supported by Queensland University of Technology through the Higher Degree Research Student Allocation program. Olivia Fisher received an Australian Postgraduate Award stipend from the Australian Government administered by Queensland University of Technology.

**Data Availability** The data described in this study are available at <https://researchdatafinder.qut.edu.au/display/n19923>

## Declarations

**Competing Interests** The authors declare that they have no competing interests.

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