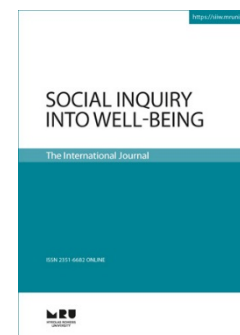




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Half Full or Half Empty: The Measurement of Mental Health and Mental Illness in Emerging Australian Adults

Emmelin Teng^{a*}, Anthony Venning^b, Helen Winefield^b, Shona Crabb^c

^a Hughes Building, School of Psychology, Faculty of Health Sciences, The University of Adelaide, North Terrace, Adelaide, SA 5000, Facsimile: +61 8 8313 3770

^b School of Psychology, The University of Adelaide, North Terrace, Adelaide SA 5005

^c School of Population Health, The University of Adelaide, North Terrace, Adelaide SA 5005

* Corresponding author email address: emmelin.teng@adelaide.edu.au

Abstract

Narrow approaches to the conceptualisation and measurement of 'mental health' are regularly but inconsistently adopted in research and practice. For example, an exclusive focus on the identification of mental illness *or* mental wellbeing runs the risk of failing to detect individuals with low or high levels of the other, and does nothing to represent an individual's level of complete mental health (i.e., taking both mental wellbeing and illness into account). The current study compared three approaches to the measurement of mental health regularly applied in the literature - an exclusive mental wellbeing / an exclusive mental illness / and a complete mental health approach - to determine if they produce similar outcomes. South Australian emerging adults were recruited ($N=117$; $M=24.4$ years, $SD=0.75$) and categorised into four mental health groups according to the Complete State Model (CSM; Keyes & Lopez, 2002) of mental health: *flourishing* (complete mental health), *languishing or struggling* (incomplete mental health or illness), or *floundering* (complete mental illness) and categories were compared. Results showed that the 'mental health' of the sample differed depending on the measurement approach used, and lend support to a complete mental health approach to better inform, develop, and target health promotion strategies.

Keywords: Mental wellbeing, mental health, mental illness, measurement, young adult

1. Introduction

Numerous approaches to the conceptualisation of mental health are being used or trialled within research and clinical practice. For example, some approaches focus exclusively on reducing the prevalence of, and associated suffering from, mental illness, while others seek exclusively to increase an individual's level of happiness, social functioning and emotional wellbeing. Historically, research and practice in the area of mental health have been focused on the former. Marques, Pais-Ribeiro, and Lopez (2011) argue that psychological research has previously been limited by a negativity bias, focusing primarily on problematic behaviours, psychological disorders and negative life outcomes which, in turn, neglect the investigation of how to promote positive development. For example, traditional measures such as the Depression and Anxiety Stress Scale

(Lovibond & Lovibond, 1995) and the General Health Questionnaire (Goldberg, 1978) focus on an individual's perceptions of their own experiences of psychological distress and psychopathology. However, as strength-based approaches to mental health have gained momentum, more focus was given to the science of optimal human functioning, mental wellness and happiness (Marques et al., 2011). Measures such as The Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) and the Psychological Well-being Scale (Ryff, 1989) were developed around the notion that in order to obtain an adequate index of subjective wellbeing, an individual's personal judgments about their positive life situation needed to be incorporated.

The advancement of strength-based approaches in research and practice then begs the question: how does positive mental health relate to mental illness? While traditionally, mental illness and mental health have been

considered opposite ends of the same continuum, increasing evidence has indicated that this is not the case (Greenspoon & Saklofske, 2001; Westerhof, 2013; Wilkinson & Walford, 1998). More recent studies have indicated that while wellbeing and psychological distress are often associated with similar social and demographic characteristics in opposite directions (e.g. being divorced, having tertiary education or low income), these two variables do not represent exact opposite ends of a continuum of mental health (Westerhof & Keyes, 2010; Winefield, Gill, Taylor, & Pilkington, 2012).

An approach to the conceptualisation of mental health that reflects this notion of two continuums is the Complete State Model of mental health (CSM; Keyes & Lopez, 2002), which incorporates one continuum indicating the level of positive mental health, and one continuum indicating the level of mental illness or psychopathology. This dual continua approach operates under the assumption that an individual's mental health is a complete state that requires not merely the *absence* of mental illness, but also the *presence* of social, emotional and psychological health (Keyes, 2005; Westerhof, 2013). Frameworks such as the CSM aim to provide a more comprehensive picture of an individual's mental health than that drawn from the measurement of its single dimensions, and research has demonstrated strong support for the dual-continua model among various populations (Keyes, 2005; Keyes, 2006; Keyes et al., 2008; Lamers et al., 2011). Other studies have reached similar conclusions using alternative combined measures of mental health and mental illness (Compton, Smith, Cornish & Qualls, 1996; Greenspoon & Saklofske, 2001; Masse et al., 1998; Suldo & Shaffer, 2008).

Although the literature indicates that the majority of young people in Australia do not have a psychological disorder (Norrish & Vella-Brodrick, 2009), nationally representative surveys have found 14% of Australian youth report symptoms of mental illness, representative of a key cause of disease burden in young people (Sawyer et al., 2001). Beyond the absence of disorder, it has been reported that less than 50% of young people are 'flourishing in life' (Venning, Kettler, Elliott & Wilson, 2013), a term referring to an individual's optimal state of wellbeing - incorporating the absence of mental illness and the presence of positive affect (Keyes, 2003). In addition, Keyes (2006) reported that more young people displayed *moderate* mental wellbeing (i.e., average emotional, psychological and social mental health) than those that were actually flourishing in life, and that moderate mental health is nearly as good a predictor of future mental illness as past mental illness (Keyes, 2010). A key challenge to the measurement of mental health in young people is that a significant proportion of young people may exhibit moderate or contradictory levels on mental illness versus positive mental health. For example, some young people may not be detected using screening measures of psychological distress, but still report low life satisfaction, while others may experience significant psychological problems, but not necessarily report low life satisfaction (Bastiaansen, Koot, & Ferdinand, 2005; Greenspoon & Saklofske, 2001; Keyes, 2006).

The term 'emerging adulthood' has been proposed to reflect a distinct period between adolescence and young

adulthood, from approximately the ages 18 to 25 (Arnett, 2000). This period has been described as being characterised by high levels of change as young adults deal with levels of uncertainty in a range of domains such as relationships, work and education, leisure, interests and development of worldviews. Furthermore, sociological and demographical studies confirm the increase in length of this transition to adulthood (Winzer, Lindblad, Sorjonen, & Lindberg, 2014). Emerging adults are described as being typically free from the dependency of childhood and adolescence, but not yet burdened with many of the responsibilities that come with entering into adulthood (Sussman & Arnett, 2014). Despite the establishment of emerging adulthood as a distinct period where it is generally perceived as socially acceptable to exhibit increased levels of self-interest, uncertainty and experimentation (Sussman & Arnett, 2014), research has indicated that the delayed timing or non-occurrence of perceived 'adult transitions' (such as obtaining a degree, starting a full-time job or establishment of an intimate long-term relationship) may still have negative effects on a young adult's mental health, through psychological functioning and subjective wellbeing (Galambos, Barker, & Krahn, 2006; Raikonen, Kokko, & Rantanen, 2011; Roberts & Bengtson, 1993). The relatively high prevalence of mental health problems (Sawyer et al., 2012), coupled with the general reluctance among young people to seek help for mental health problems (Rickwood, Deane, & Wilson, 2007) highlights the need for the development of appropriate and useful mental health approaches from a mental health promotion approach. Previous research has identified a wide range of barriers to help seeking in young adult populations, including lack of time, financial constraints, concerns about confidentiality, stigma, lack of emotional openness, lack of perceived need for help, personality traits, attitudes and health beliefs, lack of knowledge about services and scepticism about treatment effectiveness (Hunt & Eisenberg, 2010; Komiya, Good, & Sherrod, 2000; O'Connor, Martin, Weeks & Ong, 2014; Tjia, Givens, & Shea, 2005; Yap, Reavley, & Jorm, 2013). Given that it is uncommon for young people to spontaneously disclose psychological distress, new developments in mental health promotion have leaned towards incorporating broader mental health screening approaches (e.g. in school settings) to indicate those at risk and direct them to follow-up services (Husky, Sheridan, McGuire, & Olfson, 2011).

In light of the above research, it is likely that measurement approaches that conceptualise mental health as inclusive of the presence of positive aspects of mental health *and* the absence of mental illness are required for comprehensive assessment and interpretation of the mental health state of emerging adults. In considering how to design combined mental health measures, there are two key reasons to focus initially on measurement and conceptualisation: firstly, to *design and implement* efficient and effective mental wellbeing strategies; and secondly, to be able to *evaluate* these strategies and determine whether the outcomes are desirable, or whether programs should be modified to improve outcomes. Therefore, by initially examining the measurement of mental wellbeing in young adults, we can begin to understand the best approach to measurement, in order to consider how we can best

implement strategies and programs to improve mental wellbeing (Han & Weiss, 2005).

2. The Present Study

The purpose of the current study was to compare conceptualisation models of mental health to determine if they indicated similar results. Data collected from a sample of young Australian adults were used (mean age of 24 years). It is suggested that efforts towards evaluating and improving mental health are informed and shaped by the methods used to collect data (including varied measures, scores, cut-offs and classification systems) which are, in turn, essentially dependent on theoretical models used for the conceptualisation of mental health (Zimmerman, Chelminski, Young, & Dalrymple, 2011). Consequently, if we are unaware of the measurement approaches underpinning the data presented, we cannot adequately design interventions to improve the mental health of a target population as it will be unclear how to tailor these (Paternite, 2005). The current study investigated whether different approaches to measurement cause inconsistency between the interpretations of a sample's mental health by comparing three different approaches. It is hypothesised that a complete approach to the measurement of mental health would provide more information about the characteristics of the sample as compared to exclusive mental health or mental illness approaches to measurement.

3. Methods

3.1. Sample

A sample of young adults (n=117) was recruited from a pre-existing pool of participants involved in a 10-year longitudinal investigation to examine the transition of young people from school into the workplace and/or higher education (*"Transition from School to Work: A 10-year longitudinal study of unemployment, underemployment, social exclusion, and mental health in young people"*; funded by the Australian Research Council). The parent study commenced in 2001 as a planned 10-year longitudinal cohort study of school leavers, following participants from approximately 15 to 25 years of age. Data were collected on three cohorts: one beginning in 2001, the second in 2002, and the third in 2003, and the parent study received ethical approval from the University of South Australia Human Research Ethics Committee. At baseline, participants were recruited from a broad cross-section of South Australian schools including metropolitan (72.8%), rural (27.2%), government (68.3%), private (31.7%), coeducational (82.9%) and single-sex schools (17.1%). At baseline, 45 South Australian schools were randomly selected (based on type of school and area) and contacted to participate, with a 55% response rate (25 schools). Among these schools, an information letter was posted to all year 10 students (aged approximately 15 years) explaining the aims of the study with a consent form. Students who provided consent were briefed on the study and informed that participation was voluntary and confidential. During the first wave of data, amalgamated participant numbers from the three cohorts

was 2499 (male = 1030, female = 1469, mean age = 15.2). By wave 10, participation had decreased to 446 (male = 126, female = 316, mean age = 25).

The present study involved data drawn only from Wave 10 (final wave of data collection) of Cohort 2 (N=579 at baseline) and Cohort 3 (N=627 at baseline) of the longitudinal study, as at the commencement of the current study the final wave of data for Cohort 1 had already been collected (in January 2012). From these 2 cohorts, 210 responses were returned for the longitudinal study, and 124 of these contained the additional questionnaires required for the current study (59% response rate). Separate ethics approval was obtained from the University of South Australia Human Research Ethics Committee and the University of Adelaide Human Research Ethics Committee for the additional data collection for the present study. All participants in the present study had taken part in the *Transition from School to Work* study, were within the target age range (23 to 27 years of age), and were able to understand and communicate in English. All participants were required to provide additional consent to take part in the current study before participating.

4. Procedure

All participants in Cohort 2 and Cohort 3 of the *Transition from School to Work* study received information in the post with the longitudinal survey, inviting them to complete an additional survey. The single dimension measures of mental illness (General Health Questionnaire) and mental health (Satisfaction with Life Scale) were included in the original survey, while the additional survey was used to collect data for the combined measure of mental wellbeing (Complete State Model of Mental Health). Data collection took place in May 2012. The questionnaire for the current study was provided in hard copy with a reply-paid envelope, and an online version was also made available as an alternative. The information sheet that was included in the longitudinal data collection mail informed readers that participation was voluntary, and included a link to complete the survey online if preferred.

5. Measures

All data were collected from self-completed questionnaires that the participants filled out either online or with pen and paper in hard copy.

5.1. Mental Wellbeing

SWLS - the Satisfaction with Life Scale

The Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) provides a simple, brief measure of an individual's global cognitive judgments about their life. It comprises of five self-reported items that ask participants to indicate how much they agree or disagree with each statement, using a 7-point Likert scale that ranges from strongly agree to strongly disagree (Diener et al., 1985). The SWLS has demonstrated good psychometric properties (Diener et al., 1985; Pavot, 1993). In the current sample, the Cronbach Alpha coefficient was 0.93.

5.2. Mental Illness

GHQ-12 – The General Health Questionnaire

The General Health Questionnaire (GHQ-12; Goldberg, 1978) is a screening tool used to identify psychological distress experienced within the most recent few weeks. The GHQ-12 is a shortened version of the GHQ, comprising of 12 self-reported items that ask participants to indicate which of four responses applies most to them (ranging from “better than usual” to “much less than usual”). Some examples of items in the GHQ-12 are “felt constantly under strain” and “been able to concentrate on whatever you are doing”. The common binary scoring method (0-0-1-1) was used, with the threshold (cut-off) score 2/3; where 3 or more points indicated a potential case of depression or anxiety (Donath, 2001). The GHQ-12 has demonstrated good psychometric properties in both clinical and nonclinical samples, reported to be a robust shorter alternative to the GHQ-36 (Baksheev, Robinson, Cosgrave, Baker, & Yung, 2011; Fernandes & Vasconcelos-Raposo, 2013; Goldberg et al., 1997). In the current sample, the Cronbach Alpha coefficient was 0.86.

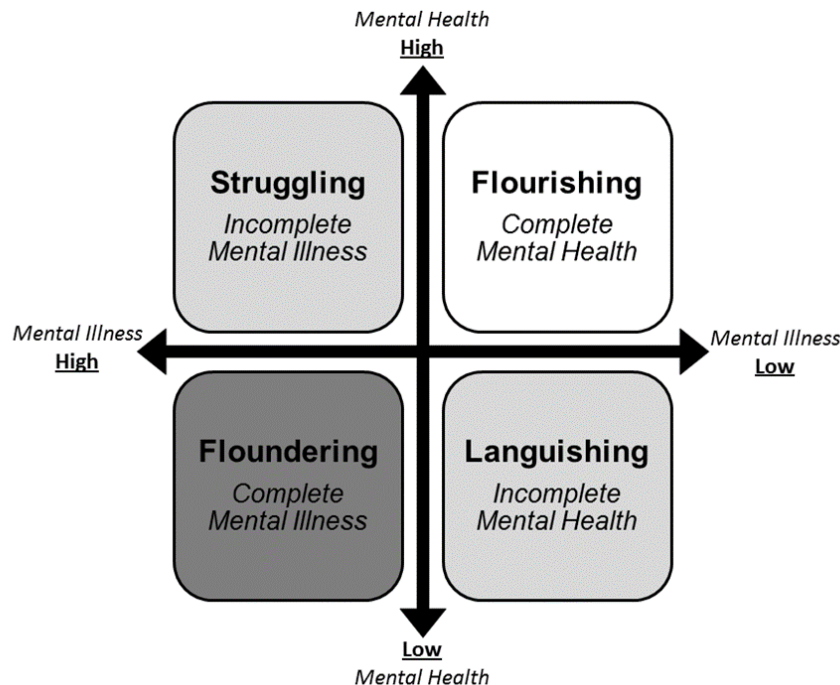
5.3. Complete State Model (CSM) Approach

The Complete State Model (CSM) of Mental Health (Keyes & Lopez, 2002) was chosen as a combined measure to provide data on the presence of mental health and mental illness symptoms (see Fig. 1). To categorise participants into

a mental health state, scores on standardised measures were combined to provide an indication of those with and/or without positive and negative symptoms of mental health and mental illness. The measures incorporated into the model include: the Psychological Well-being Scale (PWBS; Ryff, 1989) including 18 questions across six subscales (self-acceptance, personal growth, purpose in life, environmental mastery, autonomy, positive relations with others) scored on a 6-point Likert scale; The Social Well-being Scale (SWBS; Keyes, 1998) including 15 questions across five subscales (social acceptance, social actualization, social contribution, social coherence, social integration) scored on a 6-point Likert scale; and The Satisfaction with Life Scale (SWLS; Diener et al., 1985) including 5 questions, scored on a 7-point Likert scale. The Cronbach Alpha coefficients for the PWBS, SWBS and SWLS were 0.84, 0.85 and 0.93 respectively. Mental illness was measured in the CSM using the Depression Anxiety Stress Scale (DASS-21; Lovibond & Lovibond, 1995), which includes 21 questions across three subscales (depression, anxiety, stress) scored on a 4-point Likert scale (scores 0-3). The DASS-21 has demonstrated good psychometric properties (Henry & Crawford, 2005; Lovibond & Lovibond, 1995). In the current sample, the Cronbach Alpha for the DASS-21 was 0.94.

Figure 1.

Dual continua model (Keyes & Lopez, 2002)



In order to categorise young adults into CSM states, the authors applied the approach previously utilised in Venning et al., (2013), adapted from Keyes (2002). Participants were categorised into one of four mental health groups, according

to the CSM: flourishing (complete), languishing or struggling (incomplete mental health or illness), or floundering (complete mental illness). The statistical diagnostic criteria incorporated scores on emotional

wellbeing, positive functioning and mental illness and compared them against pre-determined cut-off scores (using median splits) based on the relative proportion of positive and negative symptoms reported for each individual. Participants were categorized as flourishing in life if they reported low levels of mental illness symptoms combined with high levels of emotional wellbeing and positive functioning. They were categorized as languishing if they reported low levels of mental illness (e.g., depression, anxiety and stress) and low levels of emotional wellbeing

and positive functioning. They were categorized as struggling if they reported high levels on some (not all) symptoms of mental illness, and relatively high levels of emotional wellbeing and positive functioning. Individuals were categorized as floundering if they reported high levels on all symptoms of mental illness, in addition to low levels of emotional wellbeing and positive functioning. Cut-off scores for mental health state categorization are detailed in Table 1.

Table 1.
Criteria used to Categorise Complete Mental Health State

	Depression, Anxiety and Stress	Emotional Wellbeing	Psychological Wellbeing and Social Wellbeing
<i>Flourishing</i>	Normal range on all scales	Above or equal to 21	Above or equal to 9 on 6 or more of the 11 subscales
<i>Languishing</i>	Normal range on all scales	Did not fit the category of flourishing	
<i>Struggling</i>	Mild, moderate or severe range on 1 or 2 of the scales	Did not fit the category of floundering	
<i>Floundering</i>	Mild, moderate or severe range on all 3 of the scales	Below or equal to 20	Above or equal to 9 on 5 or fewer of the 11 subscales

Demographic and basic health behaviour information

Demographic information collected included age, gender, marital status and employment.

Data screening and analysis

Data were analysed using SPSS version 20. Prior to conducting statistical analyses, preliminary analyses were performed to ensure no violation of assumptions and outliers (n=2) were removed. Several surveys were identified to have excessive missing data (n=5), in which markings were unclear or whole questionnaires were not answered at all. As this small number were less than 50% complete it was decided these would be removed from analysis. Following data screening, 117 cases of the 124 initial participants remained. Descriptive data for measures of mental wellbeing

and mental illness are reported in Table 2. Frequencies (category percentages), based on standardised cut-off scores for each measure, were used to compare differences in the reports of the overall mental health or illness of the sample. Pearson product-moment correlation was used to examine agreement between single dimension measures of mental illness (GHQ) and wellbeing (SWLS).

6. Results

6.1. Descriptive Analysis

The sample included 117 young adults ($M = 24.4$ years, $SD = 0.75$): 25% male, 80% single (never married), 88% had completed their final year of high school, and 82% undertook further study after completing high school.

Table 2.
Measures of mental wellbeing and mental illness

Variables	Mean ± SD
<i>Measures of Mental Wellbeing</i>	
- Life Satisfaction (SWLS)	24.09 ± 7.14 (range: 7-35, satisfied with life ≥ 21)
- Psychological wellbeing (PWB)	84.46 ± 9.95 (range: 18-108)
- Social wellbeing (SWB)	59.45 ± 10.09 (range: 15-90)
<i>Measures of Mental Illness</i>	
<i>DASS-21</i>	
- Depression	5.78 ± 7.88 (clinical cut-off score ≥ 10)
- Anxiety	4.90 ± 6.07 (clinical cut-off score ≥ 8)
- Stress	10.51 ± 7.71 (clinical cut-off score ≥ 15)
<i>GHQ-12</i>	2.85 ± 2.63 (clinical cut-off score ≥ 3)

Prevalence of the Four CSM Categories

Results indicated that 59% of young adults in the sample

were *flourishing* in life, 5.1% were *languishing*, 31.6% were *struggling* and 4.3% were *floundering*.

Table 3.

Comparison between measures of mental health and mental illness in young Australians.

SWLS (%)†		CSM (%)§		GHQ-12 (%)†
Extremely dissatisfied	2.6			
Dissatisfied	10.3	Floundering	4.3	
Slightly Dissatisfied	10.3	Languishing	5.1	GHQ Case 39.3
Average Satisfaction	15.4	Struggling	31.6	Not a case 60.7
Highly Satisfied	31.6	Flourishing	59.0	
Extremely high	29.9			

† Single dimension measures of mental health: SWLS (Satisfaction with Life Scale; Diener et al., 1985), GHQ-12 (General Health Questionnaire; Goldberg, 1978)

§CSM: Dual continua measure of mental health (Complete State Model of Mental Health; Keyes & Lopez, 2002)

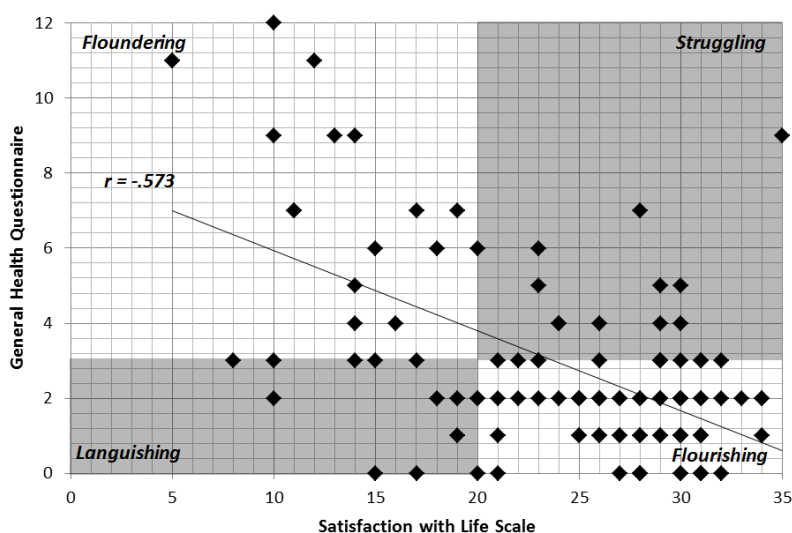
Comparison of single dimension measure of mental wellbeing (SWLS) and single dimension measure of mental illness (GHQ).

Results indicated clear differences between the SWLS as a measure of mental wellbeing and the GHQ as a measure of mental illness. From a single dimension mental illness focus, almost 40% of the sample were a potential case for depression or anxiety, indicated by scoring 3 or higher on the GHQ. Comparatively, from a single dimension focus on

mental health, only 23% of the sample were unsatisfied with life on the SWLS. The relationship between GHQ total scores and SWLS total scores was investigated using Person product-moment correlation coefficient. There was a strong negative correlation between the two variables, ($r = -.573$, $n = 117$, $p < .05$ level). This correlation is summarised on the scatterplot in Figure 2, which also demonstrates the categories that would not be well represented by single dimension measures.

Figure 2.

Adapted dual-continua model using single dimension measures (SWLS and GHQ) to represent mental health and illness (white areas indicate cases that would be well represented by single dimension measures; grey areas indicate cases that would not be well represented by single dimension measures)



Comparison of single dimension measures of mental wellbeing (SWLS) / illness (GHQ) and a combined measure of mental wellbeing / illness (CSM).

Results indicated that results provided by single or combined measures of mental health do not provide

equivalent information (see Table 3). From a CSM perspective of mental wellbeing / illness, only 59% of the sample were flourishing in life, compared to the approximate 77% reported to be mentally 'well' from a single dimension focus on mental wellbeing (SWLS). However, when

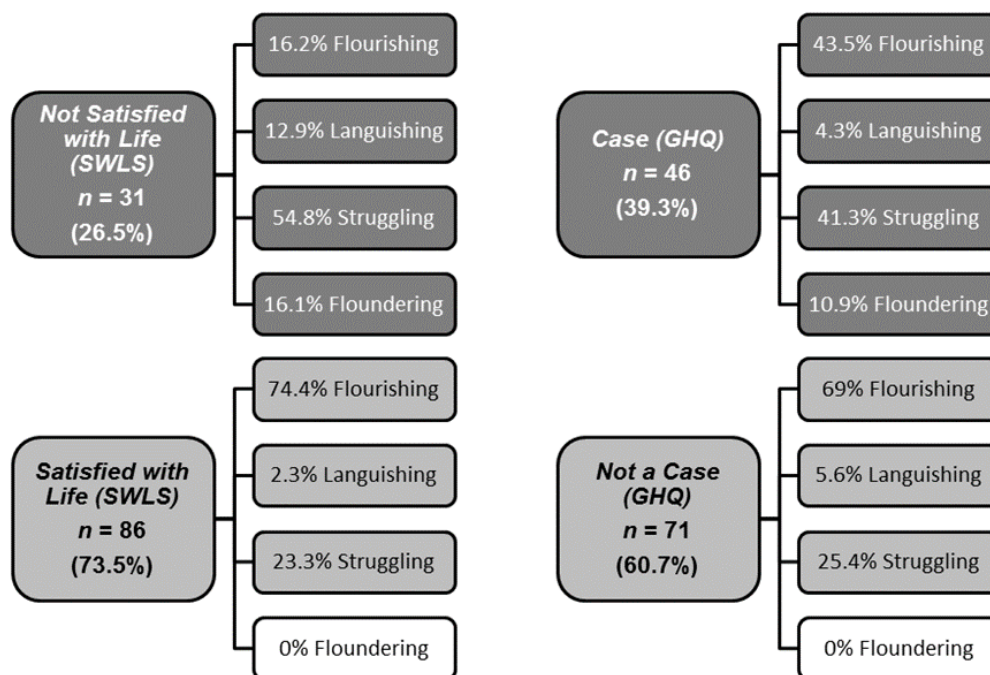
comparing the 59% reported to be *flourishing* (optimum mental health), according to the CSM perspective, to the 61% who were not recognised as a potential case for depression or anxiety using the GHQ measure, there was less discrepancy.

Overall, single dimension measures reported a more negative picture of the sample’s collective mental health.

The GHQ reported almost 40% to be a potential case for depression or anxiety, and the SWLS reported 23% to be slightly dissatisfied to extremely dissatisfied with life. However, the CSM showed that while there was about 40% of the sample that was *not flourishing* in life, only 10% were *floundering* or *languishing* in life.

Figure 3.

Prevalence break-down of CSM states within dichotomous SWLS and GHQ categories



When participants were divided into two dichotomous categories on the SWLS (satisfied with life vs. not satisfied with life), both categories were comprised of individuals from a range of CSM states (see Figure 2). The category group ‘not satisfied with life’ (26.5 of sample) was comprised of individuals from all four CSM mental health states. The category group ‘satisfied with life’ (73.5% of sample) was comprised of individuals from three of the four CSM groups. Similarly, when the GHQ measure was divided into two dichotomous categories (‘case’: a potential case for depression or anxiety vs. ‘not a case’), there was also a combination of people that fell into a varied range of CSM states. The category group ‘case’ (39.3% of sample) was comprised of individuals from all four CSM states. The category group ‘not a case’ (60.7% of the sample) was comprised of individuals from three of the four CSM states.

7. Discussion

The purpose of the current study was to compare different approaches to the measurement of mental health to determine which approach provides the more informative or

representative picture of an individual or group’s mental health.

7.1. Comparing single dimension measures of mental illness and mental wellbeing

The findings suggested that there is a considerable level of discrepancy between measurement approaches that exclusively assess mental health and those that exclusively assess mental illness within the same sample. A mental illness focus indicated that 39% of the sample could be considered a case for experiencing psychological distress. Conversely, a mental wellbeing focus indicated that only 25% of the sample was dissatisfied with life. From a population health perspective, an exclusive focus on mental illness would prompt further investigation of a considerable 40% of the sample, a disturbing result, whereas a focus on mental wellbeing would convey the impression that 75% of the group are satisfied with their lives, a seemingly positive result. In addition, the observation of cases on the scatterplot indicated that a significant proportion of cases fall outside of a single dimension model, and these languishing and

struggling categories of moderate mental health present a significant challenge to gaining a comprehensive and informative picture of groups of emerging adults with a single dimension measurement approach, in line with previous research (Keyes, 2005; Westerhof, 2013, Winefield et al., 2012).

7.2. Comparison of single and combined approaches to mental health

By comparing the differences between single and combined measures within the same sample, it is clear that the same individuals can be classified in various ways depending on the measurement approach used. The SWLS and GHQ both indicated somewhat dissimilar findings to the combined measure. For example, of those that were classified as *'not satisfied with life'* on the SWLS, 16.1% were *flourishing in life* according to CSM criteria, which are entirely contradictory labels. Similarly, of those classified as a *'case'* for depression, anxiety or stress on the GHQ, a significant 43.5% could be classified as *flourishing* according to the CSM criteria. These results highlight important inconsistencies between measures, because they suggest that individuals and groups collectively may be categorised as fitting into a wide range of mental health states, depending on the measurement approach chosen.

It is particularly useful to examine the individuals who appear to be a *'case'* for depression or anxiety on the GHQ. They represent a widely varied group, including people that fit into all four categories of mental wellbeing according to the CSM. Moreover, although one might reasonably predict that the *'case'* group would be dominated by individuals from the higher end of the mental illness continuum (including CSM states *struggling* and *floundering*), results indicated that there were almost as many individuals that fit into the groups characterised by *low* levels of mental illness and/or high levels of positive functioning (*languishing* and *flourishing*). Such apparent inconsistencies between measures are of critical importance, because they not only emphasise the potential for discrepancies between measurement approaches and increase the likelihood for the misinterpretation of data, but also raise concerns surrounding the validity of approaches. These results suggest that a combined approach to measurement may provide a more representative picture of an individual's mental health, consistent with previous research in adult populations (Howell, 2009; Keyes et al., 2008; Keyes, 2005; Peter, Roberts, & Dengate, 2011; Westerhof & Keyes, 2010). However, it should be noted that while the current results indicate that a single dimension measure could fail to capture important aspects of an individual's mental health state, it is also crucial to consider the potential risk of *'creating'* combined measures that do not possess strong psychometric properties by simply using data from separate illness and wellbeing focused single dimension measures. This notion is in line with findings from a previous study that similarly examined measures of positive and negative mental health in emerging adults, in a Swedish sample (Winzer et al., 2014).

7.3. Limitations and future research

Although the results of the current study establish a promising direction for future research on a dual mental health continuum, results should be interpreted with caution. First, the small sample size ($n=117$) in the current study represents a considerable limitation to the generalisability of results to the population of young Australian adults. Further, prevalence estimates for the CSM categories are based on a non-probability, convenience sample recruited from a pool of pre-existing participants involved in a longitudinal study. It could be hypothesised that there may be bias within the sample towards those with higher levels of emotional or psychosocial wellbeing, due to participants being more likely to have the resources (time, energy, motivation) to contribute to the study (which offered little financial compensation for participation). As previous research has suggested that timing and occurrence of perceived *'adult transition'* events may have an effect on the mental health of emerging adults, it is clear that further research is needed to explore prevalence of mental health and illness using dual-continua measures among a larger and more representative sample of emerging adults, in addition to examining the influence of the high levels of uncertainty and change that uniquely characterises this developmental phase on subjective wellbeing (Raikkonen, Kokko, & Rantanen, 2011). Additionally, in place of using well-standardised and validated CSM measures, the measurement approach employed statistical categorisation methods which were chosen to best fit in with the existing data that had been collected for the *Transition from School to Work* study. Thus, the reliance on these individual self-report instruments and predetermined cut-off scores represent a limitation to the interpretation of results. However, given that the cut-off scores utilised were based on frequently employed methods of converting scores from continuous to categorical data, the findings also highlight the potential flaws of a system of using cut-off scores when assessing mental health and illness factors.

It should also be noted that the scales and measures used in the current study are not necessarily intended to represent a comprehensive picture of mental health, and so naturally vary in their focus on slightly different dimensions or aspects of mental health and illness, and thus, some of the discrepancy between approaches is likely to be caused simply by the use of different measures. However, given that brief, single dimensions measures may be widely used as initial screening tools, for ease, convenience or speed of assessment, or to gain a brief snapshot of psychological health in combination with other measures (e.g. demographics, physical health) and across settings (Annells et al., 2010; Cappelli et al., 2012; Husky, Sheridan, McGuire, & Olfson, 2011), this limitation also draws attention to problems and concerns associated with this practice. While previous research on the GHQ has confirmed the measure as an appropriate tool for its original purpose, to detect *"psychiatric morbidity"*, it is clear that as a popular and well-validated instrument, it may be employed for

purposes beyond this (Winzer et al., 2014). Finally, it should also be acknowledged that the cross-sectional design of the current study represents a significant further limitation, as it eliminates the possibility of inferring causal relationships between factors and merely provides a snapshot of the sample characteristics at a specific point in time.

The current study is, to the best of the authors' knowledge, the first comparison between measures of positive mental health, mental illness and a combined (dual continua) mental health approach, conducted within an Australian sample. The discrepancies observed between measurement approaches serve to emphasise the need for further exploration into the varying representations that can be constructed in both community and clinical samples, dependent on measurement approach. If combined measures are to become more commonly considered when assessing the baseline mental wellbeing of groups and individuals, it will be necessary for future research to develop and standardise these measures for application within different settings and populations. Furthermore, research is needed to explore whether discrepancies in the measurement of mental health of groups and individuals has a significant effect on the mental treatment, prevention, and intervention services they are able to access.

7.4. Clinical Implications

This study builds on a research agenda for examining the conceptualisation of mental health in young people. The results illustrate a number of discrepancies between the three approaches to measurement of mental health and illness, which were found to paint three vastly different depictions of the collective mental health of a group of young people. The discrepancies between differing approaches highlight questions regarding the most helpful and accurate representation of mental health in young people, with implications for the design and evaluation of mental health programs.

It is important to note that the authors of the current study are not implying any criticism towards the use of single dimension approaches in circumstances where there is a need to screen for or identify the presence of specific mental health characteristics or factors (e.g. looking to remove cases of depression and anxiety from a sample). Indeed, single dimension measures and short-form screening tools are known to be highly advantageous for providing brief, standardised, easily administered and cost-effective methods of identifying, and prompting referrals to further services for, untreated mental health problems (Annells et al., 2010; Cappelli et al., 2012; Husky, Sheridan, McGuire, & Olfson, 2011). Rather, the authors intend to emphasise the need to exercise caution in the administration and interpretation of mental health measures and to always consider the risk of using mental health measures interchangeably to assess general mental health or mental illness, without due consideration to the possible consequences of misinterpretation of scores or categories for such groups and individuals.

From a clinical perspective, the current study draws attention to the need to be wary of the weight we place on standardised measures of young adult psychological functioning, emphasising the importance of using clinical judgement in addition to questionnaires and survey instruments. From a population health perspective, it is clear that conceptualisation plays an important role in both the design and outcome evaluation of mental health based policies and programs. Given the recent emphasis on the role of universal and population health approaches to mental health promotion in young people (Kobau et al., 2011; Patel, Flisher, Hetrick, & McGorry, 2007; Prince et al., 2007; Weist, 2005; Wells, Barlow, & Stewart-Brown, 2003), it is necessary to further explore the most appropriate measurement approach for application to different settings and populations.

If we hope to increase the implementation of mental health programs on a more widespread basis, clear targets (dependent on measures used) are needed to produce quantifiable, extensive and ongoing demonstration that such programs are effective (Kutash, Duchnowski, & Green, 2011; Russell-Mayhew, 2006; Weist, Nabors, Myers, & Paul, 2000; Weist et al., 2005). A lack of established measures that provide comprehensive information on the spectrum of population mental health and illness poses a major challenge to the health care system in terms of planning and allocating mental health resources and monitoring the effectiveness of mental health policies and programs (Tannenbaum, Lexchin, Tamblyn, & Romans, 2009). The current study acts as a preliminary exploration into the differences between measurement approaches to mental health and illness in an Australian sample.

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