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Abstract

Objective: According to Diener (1984) wellbeing is a multi-faceted concept reflecting satisfaction with life, good physical health and fewer negative psychological symptoms. Using data from a 10-year longitudinal study of school-leavers (n = 390), we examine whether people aged 25 can be differentiated into ~~two~~ clusters based on indicators of wellbeing, then whether membership in the healthy as opposed to the less healthy cluster can be predicted by age 15 variables. **Method:** Tested predictor variables at age 15 captured the major influences in Bronfenbrenner's Ecological Theory (1979) including individual, family and social influences. Young adults (age 25) were differentiated into two clusters based on indicators of mental health and subjective wellbeing. **Results:** Poorer health, self-image, family functioning and peer relations at age 15 predicted poorer overall wellbeing at age 25. **Conclusions:** Results underscore the potential value of psychological support for adolescents within the school environment and ~~its role in~~ the early identification of individuals at risk of problems which may persist into adulthood.

Keywords:

adolescence; longitudinal studies; family factors; health; social environment; wellbeing

Key points

1. We explored the capacity of health, mental health and psychosocial information gathered from 15 year olds, to predict wellbeing at age 25, using a cluster analysis which allocated participants to two groups: good or poorer outcomes.
2. Poorer health, self-image, family functioning and peer relations at age 15 predicted poorer overall wellbeing at age 25.
3. Results enhance the potential for effective school-based interventions to maximise wellbeing in early adulthood.

The World Health Organisation (WHO, 2003) has identified mental health as a complete state of well-being and not just the absence of mental illness, with mental illness being defined as a psychological syndrome associated with distress, disability, and impaired functioning (American Psychiatric Association, 2000). Although mental health problems can affect people at any stage in life, there is evidence that young adults (18-24 years) may be at particular risk due to the insecurity and instability associated with this transitional phase of life (Arnett, 2000; Park, Paul, Adams, Brindis, & Irwin Jr, 2006). In support of this, a study by the Mental Health Council of Australia (2007) showed that 26% of young Australians (16-24 years) reported experiencing psychological problems in the preceding 12 months, with depression and anxiety the most frequently diagnosed (American Psychiatric Association, 2000; Mental Health Council of Australia (MHCA), 2007). Psychological problems can affect an individual's functioning in a social, family, educational, and vocational context (Department of Health ~~and~~ & Ageing (DHA), 2009), with social problems commonly including unemployment, poverty, and a higher risk of criminal behaviour (Australian Institute of Health ~~and~~ & Welfare, 2010).

Economically, the annual cost of mental illness in Australia is estimated to exceed 20 billion dollars, which includes lost productivity and reduced labour force participation (MHCA, 2007). Given the emotional, social, and financial burden of mental illness, there is increasing interest in finding effective ways to predict early problems in mental health and how to prevent them (DHA, 2009). This is recognised for example by the Australian government (DHA, 2009) and is summarised in the Fifth National Mental Health Plan (Department of Health ~~and~~ & Ageing, 2015) which offers a framework for a system of care that enables the prevention, early detection, and recovery from mental illness. Central to this framework is the reduction in mental health problems (e.g., reduced levels of suicide,

substance abuse, and mental illness) through the effects of empirically supported programs to reduce symptoms of mental illness (Calear, Christensen, Mackinnon, Griffiths, & O'Kearney, 2009; Lowry-Webster, Barrett, & Dadds, 2001).

As pointed out by Venning, Wilson, Kettler, and Eliott (2012), much of the focus of earlier programs and research into mental health was upon the alleviation of negative symptoms. However, there is now evidence to suggest that mental illness and good mental health (as reflected ~~in~~ by indicators such as subjective wellbeing) are separate constructs and do not simply represent opposite ends of the same continuum (Keyes, 2005, 2007; Keyes & Lopez, 2002). Consequently, there has been growing interest in models and research frameworks that examine, not only the predictors of mental health, but also the predictors of positive outcomes, including subjective wellbeing. One such approach is the Complete State Model (CSM) which is a diagnostic framework that conceptualises mental health and mental illness separately (Keyes & Lopez, 2002). The CSM defines Complete Mental Health (CMH) (i.e., flourishing in life) as not just the absence of mental illness, but also the presence of high levels of subjective wellbeing (SWB) (Keyes & Lopez, 2002). Flourishing in life is described as the optimal state of functioning, in which ~~an~~ individuals feel~~s~~ positive emotions, ~~is~~ are fulfilling their potential, and ~~is~~ are purposefully attaining their goals and aspirations (Grant & Cavanagh, 2007). It would be reflected, for example, in people who report being satisfied and fulfilled in combination with having few mental health problems. The reverse of this state (floundering) occurs when people have higher levels of mental illness combined with lower levels of SWB. Research has indicated that individuals diagnosed as flourishing: report fewer workdays missed; less use of healthcare services; better psychosocial functioning, fewer harmful health-related behaviours (e.g., smoking); and fewer chronic physical diseases (Grant & Cavanagh, 2007; Keyes, 2002, 2006, 2007; Venning et al., 2012). The CSM suggests that

the objective of strategies to promote mental health should be to shift people from poorer states of functioning (i.e., languishing, struggling, or floundering) towards a sustainable state of flourishing in life (Keyes & Lopez, 2002).

In line with this alternative framework of mental health, a number of complete mental health theories have been proposed. One of the main theories is Diener's (1984) theory of subjective wellbeing (SWB), which asserts that SWB is based on how people evaluate 1) their lives in terms of global judgement (e.g., life satisfaction), 2) the domains of their lives (e.g., physical health, self-esteem, body image, family assessment, financial strain), and 3) their ongoing feelings about what is happening to them (e.g., negative or positive affect). A similar perspective is evident in positive psychology approaches which have emphasised both a research and therapeutic shift towards building individual strengths and helping people to flourish in life rather than merely exist (Duckworth, Steen, & Seligman, 2005; Seligman, 1991, 2005; Yates & Masten, 2004). Research from this perspective argues that only when positive psychological factors, negative psychological factors, and their interaction are accounted for, will therapy reduce suffering and ~~increase~~ improve mental health (Seligman, 2005). With this in mind, Duckworth et al. (2005) have suggested that ~~by increasing an individual's experiences of positive emotions, enriching relationships, engagement, and meaning in life,~~ a positive psychological approach can effectively prevent the onset of mental illness, as well as enhancing subjective well-being (i.e., cognitive and affective evaluations of one's life). Consistent with this suggestion, a meta-analysis of 51 positive psychological interventions (N = 4226) by Sin and Lyubomirsky (2009) provided evidence that this approach was effective in both enhancing subjective well-being and reducing depressive symptomatology, with effect sizes ranging from -.28 to .81. Therefore, an approach that

focuses equally on building positive psychological factors, along with reducing negative psychological factors, may be ~~more~~ most effective in promoting mental health.

In general, studies that have investigated the subjective wellbeing of young adults present a very mixed view. Smart and Sanson (2005) suggested that up to 86% of young people in Australia are satisfied with life, whereas figures reported in the American literature are much lower. Keyes et al. (2012) report studies showing that only 49% of American young adults are flourishing in life, whereas Australian studies by Venning et al. (2012) indicate that just 42% of adolescents (13-17 years) can be described in these terms. Research by Teng, Venning, Winefield, and Crabb (2015) showed that 59% of young people in the South Australian School leavers cohort were flourishing, 32% were struggling, 5.1% were languishing and 4.3% were floundering. This research was based upon classifying young people into groups based upon certain cut-off scores on standardised measures. It would also be important to examine how young people might cluster based upon ~~their~~ continuous scores on wellbeing ~~the~~ measures ~~selected~~, given that the assignment of cut-off scores can be subject to variation. Another important consideration is to examine the extent to which differences in young people's level of functioning in their mid-20s can be predicted by characteristics present during adolescence.

Predictors of Mental Health and Wellbeing in Young People

Studies that have examined general mental wellbeing have generally operationalised this in terms of measures of global and domain satisfaction (Diener, 1984). Global satisfaction refers to satisfaction with life in general, whereas domain satisfaction can refer to satisfaction with family, the self, body image, the job, or finances. On the whole, studies of the predictors of life satisfaction in early adulthood (age 18-30) show that the factors that

influence mental health and subjective wellbeing are likely to be complex. For example, consistent with Brofenbrenner's (1979) ecological model, these influences are known to span a range of factors, extending from individual level physical and psychological factors and individual behaviour to broader social and family influences. Other well-known frameworks such as Antonovsky's salutogenic theory (Antonovsky, 1967, 1979) similarly propose multifactorial theories of aetiology, whereby one needs to consider outcomes to be a function of a range of factors, including: the characteristics of individuals, their adaptiveness and the various social and psychological resources available to them.

Psychological predictors. At the psychological level, meta-analytic studies of longitudinal studies have found that poorer self-esteem is a major risk factor for depression and anxiety (Sowislo & Orthu, 2013), and is associated with lower life satisfaction (Diener & Diener, 1995), ~~-~~less positive affect (Wood, Heimpel, & Michela, 2003), poorer physical health status (Antonucci, Peggs, & Marquez, 1989), and less optimism (Heinonen, Raikkonen, & Keltikangas-Jarvinen, 2005). Another important factor is body image dissatisfaction which has been found to be associated with a number of negative health outcomes including risky sexual behaviour (Schooler, 2012), depression, anxiety, and poor self-esteem (Kostanski & Gollone, 1998). ~~On the other hand,~~ P~~p~~hysical health would also appear to be important (Diener; 1984). For example, Haarasilta (2003) found that adolescents who reported poorer self-perceived health were more likely to suffer from depression than peers who reported better self-perceived health. Similarly, unhealthy behaviours such as smoking cigarettes and marijuana have both been shown to predict future episodes of depression (Bovasso, 2001; Galambos, Leadbeater, & Barker, 2004). P~~However, p~~hysical health has also been linked to positive outcome measures. Positive affect has been found to be associated with lower blood pressure (Ostir, Berges, Markides & Ottenbacher, 2006); cardiovascular health and immune

function are strongly linked to optimism (Rasmussen, Scheier, & Greenhouse, 2009); and self-reported physical health has been shown to ~~longitudinally~~ predict both life satisfaction longitudinally (Gana et al., 2013) and self-esteem (Reitzes & Mutran, 2006). ~~Accordingly, activities such as exercise that improve physical health also tend to improve mental health (e.g., Raglin, 1990). Hogan, Catalino, Matta, and Fredrickson (2015) have suggested that the mechanism through which this improvement takes place may be through an increase in positive emotions caused by the exercise. Consistent with the Broaden-and-Build Theory of Positive Emotions (Fredrickson, 2001), increases in positive emotions (e.g. from exercise) may help to build psychological resources which lead to flourishing in life. The link between physical health and positive emotions is important, as many theorists have identified positive emotions as one of the major pillars of psychological wellbeing (Seligman, 2011).~~

Behaviour: Leisure activities. In similar vein, there is evidence to support associations between engagement in appropriate leisure activities at a younger age and greater psychological wellbeing. Leisure is argued to be important to youth wellbeing because it provides the opportunity for the development of new skills, the establishment of social relationships, and the formation of new identities during adolescence (Kleiber & Kirshnit, 1991). Other psychologists have argued that leisure activities promote autonomy and the development of decision-making skills (Garst, Scheider, & Baker, 2001). Accordingly, adolescent leisure activity is associated with better life outcomes and psychological wellbeing (Bartko & Eccles, 2003), and a clearer sense of self-identity (Garst et al., 2001). Leisure activities may also buffer against the effects of stress (Hutchinson, Bland, & Kleiber, 2008). However, despite the positive association found between psychological wellbeing and leisure, research also shows that ~~the~~ leisure time may only be beneficial if it provides sufficient challenge or structure (e.g., Trainor, Delfabbro, Anderson, & Winefield, 2010). This caveat

may explain why less challenging and structured leisure activities like watching television have been linked to less identity development and lower overall happiness (Bruni & Stanca, 2006; Shaw, Kleiber, & Caldwell, 1995). Garst et al. (2001) suggest that these findings are consistent with research showing that activities with clear goals are more psychologically beneficial. The findings are also consistent with the psychological theory of "flow" developed by Csikszentmihalyi (1998). Csikszentmihalyi defined flow as an optimal experience of enjoyment which involves complete absorption in an activity and an associated lack of self-consciousness. The theory posits that flow is most likely to be achieved through structured and challenging leisure activities (e.g., sport) compared to passive leisure activities (e.g., watching television) (Csikszentmihalyi, 1998). Given that flow is synonymous with engagement, and engagement itself has been identified by some theorists as one of the five pillars of psychological wellbeing (e.g., Seligman, 2011), leisure time usage may be a crucial predictor of the flourishing life.

Personality. There is a significant volume of literature to suggest an association between certain personality traits, most notably neuroticism and extraversion, and psychological wellbeing. Examination of personality traits is important because they show considerable stability over time (Matthews, Deary, & Whiteman, 2009). Research indicates that adolescents and adults higher in extraversion or lower in neuroticism tend to have greater wellbeing (Garcia, 2011). Recently, longitudinal research has demonstrated that neuroticism and extraversion measured at ages 16 and 26 influence future wellbeing at age 60-64 (Gale, Booth, Mottus, Kuh, & Deary, 2013). Gale ~~and colleagues~~et al. (2013) found that extraversion had a direct, positive effect on wellbeing, while neuroticism had ~~in~~ an indirect effect through susceptibility to physical health problems and psychological distress.

Therefore, these two personality traits are suggested to have an enduring impact on mental health throughout life, and are worthy of further exploration.

Family and Social Functioning. A number of studies have shown that young people living in homes characterised by better family functioning have better mental health. For example, Paradis et al. (2011) demonstrated that self-rated family assessment at age 15 predicted adult adaptive functioning across a number of different domains at age 30. Peer relationships are also equally important (Umberson & Montez, 2010). Fewer close relationships, smaller social networks, and lower perceived social support have all been shown to be associated with depression (Barnett & Gotlib, 1998). Furthermore, as Landstedt, Hammarström and Winefield (2015) have found, the relationship between depression and social relationships can be particular strongly during adolescence (Falci & McNeely, 2009). The experience of bullying, for example, has been shown to be associated with greater anxiety and depression and lower self-esteem (Salmon, James, & Smith, 1998; Wilkins-Shurmer et al., 2003). Research has suggested that peer relationships have profound importance because they provide the social support and belongingness required for successful adolescent development and transition into adulthood (Kupersmidt, Coie, & Dodge, 1990). Based on the importance of peer relationships, there has been some emphasis on the need to develop emotional skills in adolescence such as empathy (Laible, 2007). Research has demonstrated that higher levels of empathy in adolescence has been associated with more prosocial behaviour and less aggressive behaviour (Carlo, Raffaelli, Laible, & Meyer, 1999), and can mediate the relationship between peer attachment and self-esteem (Laible, Carlo, & Roesch, 2004).

Present study

A brief summary of the literature shows that mental health and wellbeing in young people appears to be related to both individual-level and broader social factors. Studies have examined the predictors of both wellbeing as well as mental illness. However, inconsistent with frameworks that conceptualise wellbeing to be both the absence of mental illness ~~and~~ as well as the presence of well~~-~~being, such studies have not generally examined both types of dependent measures in the same study. In other words, what factors predict which young people are both more satisfied with their lives (higher satisfaction) and have lower scores on indicators of mental illness? In this study, we present ~~the~~ longitudinal findings from a study that examined the mid-adolescent predictors of psychological status at age 25 years. In this study, young adults are identified in terms of clusters differentiated by ~~based upon~~ their combination of ~~both~~ better life satisfaction and~~s well as~~ reduced symptoms of mental illness. In terms of the CMH model, the study examines what factors differentiate between those who are flourishing (i.e., higher life satisfaction and low mental health problems) and those who are floundering (i.e., low life satisfaction and higher mental health problems). ~~It was~~We predicted that healthy overall functioning (flourishing) at age 25 would be associated with the age 15 factors previously identified in the literature, namely: better physical health; better self-esteem and self-image; better social and family relationships; higher extraversion and lower neuroticism scores, and more constructive leisure activities.

Method

Participants

The data (n = 390, M =110, F = 280) for this study were derived from the South Australian School Leavers project and comprised those who provided data at ~~for 10~~ measurement points ten years apart (at ~~from the~~ ages ~~of~~ 15 and~~to~~ 25 years~~ of age~~). This

sample was a subset of a larger 10-year longitudinal study which originally involved a baseline sample of 2552 (M = 1041, F = 1485, 26 missing gender data) secondary school students with a mean age of 15.2 years (*SD* = 0.50). Sampling details of this study have been previously described in Delfabbro, Winefield, and Winefield (2013) but are briefly summarised for convenience: informed consent for participation was obtained from children's parents and after age 18 from the participants themselves, and the project was approved by the Human Research Ethics Committee of the university. Students were recruited from 25 schools in both rural and metropolitan South Australia and this represented just over half of the 45 institutions that had been randomly selected to participate. Participants from metropolitan Adelaide comprised 71.1% (*n* = 1814) of the sample and included participants from 19 schools, whereas 677 (26.5%) students came from rural and regional schools (61 students did not provide their school's name). There were no exclusion criteria for participation in the study. Matching of the final school sample with population figures showed that the composition of the sample was generally consistent with the government/ non-government and rural/ metropolitan distribution of schools. The data for this study were based on those who remained in the study until time 10 (age 25). This end-point was chosen to allow the maximum follow-up time, reflecting our research question about the predictors at age 15 of well-being in early adulthood.

Sample Attrition. The attrition rate for this study was commensurate with a similar and highly cited school leavers study conducted by Winefield, Tiggemann, Winefield, and Goldney (1993). Around 40% of the sample was lost from age 15 to 16 years, but sample size was more consistently maintained thereafter. By Time 5, 812 of the sample still remained in the study, and by Time 10, 390 remained. Attrition analysis showed that males were more likely to leave the study than females: at Time 10, 73% of the sample were female vs. 59% at

Time 1. Although the cause of missingness of data is difficult to determine because it can be attributable to both observed and unobserved variables, earlier analysis by Analysis of the missing data in this study (DDelfabbro, Winefield, Winefield, Malvaso, &and Plueckhahn , (2017) indicated that the selective drop out of males from study is unlikely to have had a strong impact on the results. Scores on key variables were generally similar for those who remained in the study as opposed to those who dropped outeresupported the assumption that showed that the data were Missing at Random (MAR) which indicated that the source of the missingness was accounted for by other known variables (namely, male gender). Comparisons of scores on variables and relationships between key psychological and social variables presented in this paper appeared to be minimally affected by the missing data.. Given that 390 represents a sufficiently large sample to achieve an acceptable level of statistical power as well as meet the assumptions of all statistical tests used (e.g., regression and t-tests), the results are based on the retained sample and are not supplemented by imputed data.

Commented [HW1]: Paul should this clause be removed? It seems to contradict the idea of MAR.

Procedure

Schools participated with the approval of principals and surveys were conducted under supervision by research assistants and/or teachers. All participants were required initially to obtain parental consent. In subsequent years data collection occurred using postal surveys, supplemented towards the end of the 10-year period, with online surveys. Incentives in the form of payments of $15 were paid for each survey completion for waves 7 and beyond.

Analysis Preparation and Strategy. A cluster analysis was undertaken in order to identify significant groups within the Time 10 sample related to general mental and physical health. The clusters were formed using six variables related to mental health (self-esteem; GHQ-12;

Social Alienation; Negative Mood; Life satisfaction) and the physical health rating. Data were analysed initially using a hierarchical clustering procedure to determine the appropriate number of clusters (Hair, Anderson, Tatham, & Black, 1995). Ward's method (Ward, 1963) was used as the clustering algorithm because of its tendency to generate clusters that are homogenous and relatively equal in size (Hair et al., 1995). As a similarity measure, squared Euclidean distance was used as it is recommended for Ward's method of clustering. These results suggested that, while a 3-cluster solution was feasible, a 2-cluster solution was better ~~more optimal~~ given the small number of cases in the third cluster (n = 23). For further information relevant to the rejection of a 3-cluster solution, please see the Appendix table. The Appendix shows that a third cluster was very small and similar to Cluster 2 in its profile of scores. There were ~~also~~ large differences in scores between Cluster 1 and 2 and only small differences between Cluster 2 and 3. To ascertain the characteristic of the two clusters, a non-hierarchical or K-means cluster analysis was undertaken.

The second principal analysis involved the development of a logistic regression model to identify the best predictors of general wellbeing at age 25. ~~Backwards elimination was used to enter the variables into the logistic model. All variables were entered in together and then variables were removed if they did not give rise to any significant change in the value of the log-linear likelihood ratio.~~

This analysis was conducted in a series of stages because of problems of multi-collinearity. The first stage of model building involved the entry of the variables which comprised the basis for the age 25 clusters as baseline control measures. Those variables which had unacceptably high variable inflation factors (> 2.5) were removed. The remaining variables were then added in sequence: personality, social, leisure, coping style and self-image. These were only retained in the final model if they contributed to a significant chance in the log-

linear likelihood ratio as they were entered on each stage and if they were significant. For example, if social variables yielded no significant change in the -2LLR, then they were not included in the model. This process ensured the development of a stable and parsimonious model that was not overly affected by multi-collinearity.

Measures

(i) Demographic/Background Variables. Participants were asked to report their gender, age, and ethnicity/cultural identity (Aboriginal or Torres-Strait Islander descent). They were also asked at age 15 whether their parents co-habited (Yes/No), whether there was any unemployment in their immediate family and if their mother or father worked in a professional vs. other type of occupation. They also rated if they themselves were employed at age 25 (1 = No, 2 = Yes).

(ii) Health-related variables. Participants were asked to give a rating of their health status on a 5 point rating scale, where 1 = Very healthy most of the time, 2 = Quite healthy most of the time, 3= Sometimes healthy, sometimes ill, 4 = Quite ill most of the time, 5 = Nearly always ill. They also completed the General Health Questionnaire (GHQ-12, Goldberg & Williams, 1988). The widely-used GHQ-12 was designed as a screening instrument to provide information on current mental wellbeing in community samples, rather than giving a specific psychiatric diagnosis (Hankin, 2008). Participants were asked to rate the degree to which they had experienced each of twelve symptoms (e.g. Lost sleep over worry, Been feeling unhappy or depressed in the past few weeks by selecting one of four response categories (i.e., 1 = More so than usual; 2 = Same as usual; 3 = Less than usual; 4 = Much less than usual). The scores were recorded using the standard binary coding method in which for each item, the two responses indicating psychological distress were scored as a one and

the other two as a zero. This method of scoring resulted in scores that ranged from 0 to 12 with higher scores signifying more psychological distress. The GHQ manual notes that the scale can be used with adolescents. The internal reliability was very good in this sample, α = 0.80.

(iii) Social variables

a. Victimization / Bullying. Participants were asked to report their experiences of being bullied by peers at school and outside of school. Participants were presented with five statements regarding various forms of victimization (i.e., "I get picked on by other kids", "I get picked on by some teachers", "I get hit and pushed around by other kids", "Other kids make fun of me", "I get called names by other kids") and were asked to rate on a 4-point scale the extent to which each of these had been their experience both in school and outside of school (1 = Never; 4 = Very often). The 8 items were combined to yield a total bullied by peer score that could range from 8-32 (maximum). The bullying by peers scale was found to have very good internal reliability (α = .82).

b. Peer relationships. Participants were asked to report the number of friends they had (a number between 0 and 30), the number of their class peers that they ~~do~~ did not like (0-30), and to estimate the number of class peers that disliked them (0-30).

c. Family functioning. The General Functioning scale from the Family Assessment Device (Epstein, Baldwin, & Bishop, 1983) was used as a measure of family functioning (11 of 12 items were included because one item reduced the a~~A~~lpha v~~V~~alue of the scale: "We cannot talk to each other about the sadness we feel"). The items selected for the present study all provided global measures of family functioning (problem solving, communication, roles,

affective responsiveness, affective involvement, and behavioural control). Participants were asked to rate the extent to which each aspect of family functioning described their immediate family on a scale of one to four (1 = Strongly agree; 4 = Strongly disagree) giving a score range of 11 to 44 (excellent functioning). This measure proved to have good internal consistency, $\alpha = 0.77$.

d. ***Physical Appearance***. Responses were asked to rate how satisfied they were with their physical appearance at age 15 on a , where 1 = Very satisfied, 5 = Very satisfied).

(iv) Psychological variables

a. Personality Measures. Participants completed the Costa and McRae (1992) extraversion and neuroticism subscales. Each scale comprises 12 items which are answered using a 5-point Likert scale ranging from 1 = Strongly disagree to 5 = Strongly agree to yield a scoring range of 12-60. Both of these scales had very good internal consistency in this sample, both a~~A~~lphas $\alpha > 0.80$.

b. Self-esteem. Self-esteem was measured using Rosenberg's (1965) self-esteem scale. This scale consists of 10 items and respondents indicate their level of agreement (1 = Strongly agree, 2 = Agree, 3= disagree, 4 = Strongly disagree). The scoring range was from 10 (low self-esteem) to 40 (high self-esteem). This scale had very good internal reliability in the present sample, $\alpha = 0.82$.

c. Life-satisfaction. An abbreviated version of Warr, Cook and Wall's (1979) Life-satisfaction scale was administered. This consisted of 7 items describing aspects of life (e.g.,

education, family life, present Government) and respondents indicated their level of satisfaction on a 5 point scale ranging from 1 = Extremely dissatisfied to 5 = Extremely satisfied. Possible scores ranged from 7 (Low satisfaction) to 35 (High satisfaction). This scale had acceptable internal reliability, $\alpha = 0.73$.

d. Negative Mood Scale. (Tiggemann & Winefield, 1984). This 7-item scale required participants to rate how they had been feeling in relation to 7 statements of emotions. Each descriptor (e.g., sad, bored) was scored on a 4-point scale (1= Almost never to 4 = Almost always). Scores ranged from 7 (positive mood) to 28 (high negative mood score). This scale had a very good internal reliability, $\alpha = 0.80$.

e. Social alienation. The Dodder and Astle (1980) social alienation scale consisted of nine statements and respondents were required to indicate whether they agreed or disagreed with each statement. This scale was adapted from Srole's Anomie scale (Srole, 1959) designed to measure a person's perception of meaninglessness in society, or cynicism. This measure had a barely acceptable internal consistency, $\alpha = 0.60$.

Results

Two clusters (Cluster 1, n=267, Cluster 2, n=123) could be clearly distinguished in terms of significant mean differences on the variables. The two clusters had a similar gender composition (70% women in both) and did not differ in the percentage of parents working in professional occupations (48% in the better cluster and 42% in the lower cluster). The results for other variables and the magnitude of the differences are displayed in Table 1. As indicated in Table 1, there were very large differences between the two groups on all measures of physical and mental health. Those in Cluster 1 had significantly better mental and physical health than those in Cluster 2. In addition, proportion difference tests were used to compare

responses to questions relating to employment status and smoking and recreational drug use in the previous 12 months. Those in the flourishing cluster were significantly less likely to report having not been employed (3%) as compared with those in the other cluster (~~3~~12%), Z (384) = 3.50, $p < .05$. Those in the flourishing group were less likely to report smoking cigarettes (7.1% vs. 12.9%), Z (384) = 2.24, $p < .05$ and to have used marijuana (1% vs. 4.3%), Z (384) = 2.07, $p < .05$.

[INSERT TABLE 1 about here]

These clusters were then used as the basis for a series of age-15 comparisons presented in Table 2. These comparisons show how the two age-25 clusters differed on a range of variables during adolescence (age-15). Those who had poorer health at age 25 scored more poorly on similar measures at age 15. They were more likely to report unproductive leisure activities and fewer activities involving other people; they were more likely to report poorer relationships with their peers, had poorer family functioning, scored lower on task-based coping and higher on emotion-based coping, and scored higher on Neuroticism and lower on Extraversion. The effect sizes ranged from small to large, with the largest differences being observed for variables such as life-satisfaction, family functioning, negative mood and self-image.

[INSERT TABLE 2 about here]

The results of the logistic regression are displayed in Table 3.

[INSERT TABLE 3 HERE]

The logistic regression showed that the strongest predictors of being in the ~~higher functioning~~ Flourishing group (Cluster 1) were peer relations (how many class-mates were not liked by the respondent at age 15),~~;~~ their self-image,~~;~~ and the quality of family functioning. Those who at 15 had better relationships with their peers, better self-image or family functioning, were more likely to be in the ~~higher functioning~~ flourishing (Cluster 1) group at 25. Poor scores on all ~~three of~~ these variables were therefore risk factors for being in the ~~Lower functioning~~ Floundering Group (Cluster 2) ~~group~~ at age 25. A greater number of peers not liked at age 15 were both associated with a greater odds odds of being in the Floundering Group (Cluster 2). ~~For example, as indicated by the odd~~Furthermore, as indicated by ~~s~~ odds-ratios with values < 1, each increase in the physical appearance rating towards a more ~~dis~~satisfied score was associated with ~~a~~ 1/ 0.7 = 1.43 times greater ~~likelihood~~odds of being in the ~~lower functioning~~Flourishing group (Cluster 1), whereas each unit increase in the Family Functioning score (a better score) was associated with a 1/ .93 = 1.075 or 7.5% increased odds~~likelihood~~ of being in the ~~lower cluster~~Flourishing group (Cluster 1).

Discussion

The aim of this paper was twofold. The first was to examine the extent to which young adults could be differentiated based on indicators of overall subjective wellbeing and mental health at age 25 years. The second was to examine how well membership in these clusters (broadly corresponding with the flourishing and floundering groups postulated in the CMH model) could be predicted based upon measures at age 15. The measures included attempted to capture the three most proximal developmental influences conceptualised by Bronfenbrenner's Ecological Theory, namely the role of individual, familial and social factors. The results showed that ~~it was possible to differentiate~~ two clear clusters of people at

age 25 based on measures of wellbeing that encompassed physical health, psychological health and life satisfaction. Further analysis showed that the lower cluster differed significantly on a range of measures and indicators measured at age 15. In particular, young adults with overall poorer subjective wellbeing tend to have reported poorer scores on indicators of physical health and psychological wellbeing when they were teenagers. As teenagers, they were also more likely to have poorer self-image, poorer peer and family relationships, higher neuroticism scores and lower extraversion scores. Indicators from each of these domains remained significant in the final multivariate model.

The conclusion to be drawn from these findings is that problems experienced by young people appear to be highly clustered or correlated. That is, it appears that having problems in one area of development is related to other areas. Those who are doing less well physically and psychologically are also experiencing problems in other social areas. These observations lead to several possible interpretations. One view is that individual level wellbeing is influenced by familial and social problems, so that young people who are exposed to unsupportive or even disruptive social and family environments develop greater negative affect, poorer self-esteem and lower life satisfaction. ~~Another way to express this is to say that there are different kinds of people who tend to have different social experiences.~~ Another possibility is that some young people, because of their particular psychological and physical characteristics, are less effective in developing supportive social relationships. For example, a teenager who has poorer self-image, health and self-esteem from an early age is less able to form many relationships, has fewer friends and is more likely to be the target of bullying. A third, and perhaps the most likely possibility, based on Ecological Theory is that there is an interaction between individual-level factors and the social environment. Those who have underlying psychological and physical vulnerabilities experience a perpetuation of

these problems when the family or peer environment is disruptive or where there are social environments characterised by a lack of support. The extent to which social and family environments can moderate the effects of psychological vulnerability during adolescence has been the subject of a number of investigations (Hall-Lande, Eisenberg, Christenson, & Neumark-Sztainer, 2007; McFarlane, Bellissimo, & Norman, 1995; Repetti, Taylor, & Seeman, 2002; Taylor, Repetti, & Seeman, 1997; Viner et al., 2012) but was beyond the scope of the present paper. However, even in light of this evidence it is likely that making generalisations about all young people is probably unwise. It is possible that all three explanations above are valid, but apply to different subsets of individuals.

Consistent with Diener's (1984) framework, we found it was useful to include a measure of positive development (life satisfaction) in the analyses. In general, those who report being less satisfied with life in general also appear to be those who report more negative psychological outcomes: poorer self-esteem, greater negative affect, and poorer general health. It is likely that this relationship has several possible explanations. It may be that scores on both types of measure reflect common underlying factor (e.g., shared environmental experiences), but this is not the only explanation. People who experience negative affect and who score higher on neuroticism may be more likely to adopt more pessimistic attributional styles. As a result, they may interpret their own circumstances more negatively than other people and therefore be less satisfied with life as a result of this process. What this does indicate, however, is that a single measures of poor general life satisfaction appears to coincide with other problems, so that it may be, of itself, a useful indicator of other underlying problems. Poorer scores on quickly administered measures of this nature in school settings could be a useful guide to identifying teenagers who are statistically more likely to have broader problems with self-image, psychological wellbeing and social relationships.

There are several methodological factors that should be taken into account when interpreting these findings. The first is that the study is based on only a subset of a larger sample of young people recruited for the School Leavers project. Although attrition analyses have been undertaken to rule out the possibility of significant bias in the profile of young people who were retained in the study over ~~for~~ the full 10 years~~waves~~, there is still the possibility that there may be other uncontrolled variables of which we are unaware. For example, it may be that a 3-cluster solution would have emerged if those dropping out between 15 and 16 had contributed data, or there may be~~are~~ broader sociological variables (e.g., reflecting social disadvantage) which might explain some of the relationships observed in the study. Second, self-report measures can be subject to common method variance, such that negative responding to one measure can anchor or prime similar styles of responding to other measures. This is sometimes because people like to be internally consistent in their responding or because questions about self-worth or peer relations can trigger negative evaluations during survey completion (Podsakoff, MacKenzie, Lee, Podsakoff, 2003). Third, the study only includes one measure of happiness (i.e., life satisfaction). Although this is generally considered to be a key construct in Diener's framework and often highly correlated with domain specific satisfaction measures, there are other standardised measures of happiness which a study of this nature could have used. I~~However, i~~n the original design of the project in the early 2000s, we had to be selective in our choice of measures to ensure that the survey was of an appropriate length; however, it does seem that life satisfaction provides a useful brief screening measure for current wellbeing.

Conclusions

In our view, there are opportunities for similar analyses to be undertaken using other longitudinal data-sets. Such analyses could for example be undertaken: using more detailed measures of wellbeing (e.g., indices of happiness); be combined with physiological measures

(e.g., cortisol levels, physical measures of health); use samples where there is less attrition or where participants have been recruited in other countries. It would also be useful to examine whether changes in social environments over time moderate the relationship between indicators of psychological wellbeing obtained during adolescence and later in adulthood. In a climate where there is interest in the mental health of the population and the extent to which it influences productivity and other life outcomes, we argue that longitudinal studies of this nature are likely to be important. From both a social-ethical and economic perspective, they highlight the potential benefits of early intervention, and support ongoing parent or school-focused interventions that attempt to create social environments to reduce bullying and promote greater social support for adolescents.

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Table 1

Significant Differences between Mean Scores for Variables Defining the Two Clusters (Time 10, Age 25)

	Cluster 1 N = 267 Flourishing	Cluster 2 N = 123 Floundering	t-value	Cohen's d
Anomie/ Social alienation	1.90 (1.78)	3.93 (2.33)	2.90*	.52
General health (GHQ-12)	2.08 (1.58)	4.15 (3.19)	6.91***	.87
Negative mood	10.19 (2.17)	15.23 (3.78)	10.9***	1.69
Life satisfaction	46.46 (4.46)	29.89 (7.08)	23.73***	2.87
Self-esteem	35.07 (3.92)	28.18 (5.68)	12.14***	1.44
Physical health rating	1.83 (0.67)	2.25 (0.72)	5.60***	0.60

*p < .05 ** p < .01 *** p < .001

Table 2

Age-15 comparisons of scores by age-25 clusters

Category	Variable	Cluster 1 (Flourishing) N=267 *M (SD)*	Cluster 2 (Floundering) N=123 *M (SD)*	*t*-value	Effect Size Cohen's *d*
Physical and General Health					
	How rate physical health	1.87 (0.61)	2.18 (0.79)	3.67***	.44
	General health (GHQ-12)	2.67 (2.33)	3.37 (2.69)	2.44*	.28
Leisure					
	Spare time doing nothing in particular	1.79 (.71)	2.00 (.84)	2.53***	.27
	Spare time activities by self	2.19 (.72)	2.20 (.88)	< 1	0
	Spare time activities with other people	2.93 (.79)	2.65 (.77)	3.15***	.36
Peer Relationships					

		How many close friends do you have (up to 30)	12.83 (7.88)	11.05 (7.81)	2.34*	.23
		How many kids in your class don't you like	3.91 (4.92)	6.64 (6.10)	4.10**	.50
		How many kids in your class don't like you	3.02 (4.25)	5.27 (6.03)	3.27**	.44
		Bullying at school	11.17 (3.14)	12.15 (3.38)	1.95	.30
		Family assessment /functioning	33.91 (5.83)	30.24 (6.15)	5.41***	.61
Coping						
		Task-based coping	53.89 (10.15)	50.56 (9.27)	2.90*	.34
		Emotion-based coping	39.71 (10.40)	43.39 (9.61)	3.15**	.18
Psychological variables						
		Anomie/ Social alienation	3.29 (2.11)	4.00 (2.15)	2.90*	.30
		Satisfaction with life	25.85 (5.49)	20.55 (7.24)	4.97***	.83
		Self-esteem	31.55 (5.55)	28.88 (5.41)	4.34***	.48
		Negative mood	11.63 (3.24)	13.43 (3.67)	4.52***	.52

Self-image					
	Physical appearance rating	3.29 (.95)	2.77 (.85)	5.05***	.58
Personality					
	Neuroticism	32.35 (7.96)	36.26 (7.32)	4.46***	.51
	Extraversion	43.89 (6.30)	40.39 (6.69)	4.79***	.54

Table 3.

Logistic regression: Age 15 predictors of cluster membership at age 25

Variable	*B*	*Wald*	*Odds-ratio*	*95% Confidence Interval*
Physical health	.39	3.47*	1.48	0.98 – 2.23
Peers not liked	.08	10.16**	1.08	1.03 – 1.14
Physical appearance	-.36	4.53*	0.70	0.51 – 0.97
Family functioning	-.07	7.17**	0.93	0.89 – 0.98
GHQ-12	-.05	< 1	0.95	0.83 – 1.09
Social alienation	.04	< 1	1.04	0.90 - 1.21

Coding: Cluster 1 = Flourishing, Cluster 2 = Floundering. All measures scored so that higher scores = Better scores. Higher or better scores on physical appearance and family functioning have a negative relationship with cluster membership, i.e., more likely to be in Cluster 1 (Flourishing).