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Do positive children become positive adults? Evidence from a longitudinal birth cohort study

Marcus Richards¹ and Felicia A Huppert²

¹MRC Unit for Lifelong Health and Ageing, London UK

²Centre for Wellbeing, Department of Psychiatry, and Well-being Institute University of Cambridge, UK

Abstract

Background—Little is known about the long-term consequences of positive wellbeing in childhood in the general population. We used the MRC National Survey of Health and Development (the British 1946 birth cohort) to test associations between adolescent positive wellbeing and social functioning in midlife.

Method—Temperament and behaviour at ages 13 and 15 years were rated by school teachers on a range of criteria. These mostly referred to absence or presence of conduct and emotional problems, but four items allowed positive ratings: ‘very popular with other children’, ‘unusually happy and contented’, ‘makes friends extremely easily’ and ‘extremely energetic, never tired’. In addition, at age 16 years survey members self-completed the Maudsley Personality Inventory, from which a summary measure of extraversion was derived, as this was previously found to be associated with midlife positive wellbeing in this cohort.

Results—Being a happy child, defined as receiving at least two of the above teacher ratings, was positively associated with midlife functioning and wellbeing, specifically a low probability of lifetime emotional problems, a high frequency of contact with friends or relatives, engagement in social activities, and to a lesser extent feeling satisfied with accomplishments in working life. These associations were independent of father’s social class, childhood cognition, educational attainment, and midlife occupational social class. There were no independent associations between being a happy child and educational or occupational attainment, being married, engagement in prosocial activities, taking leadership in community activities, and with life satisfaction in general or with family life. Extraversion was associated with a low probability of lifetime emotional problems, high engagement in social activities, being married, general midlife life satisfaction, and satisfaction with family life, but not with social contact, prosocial activity, leadership activity, or work satisfaction. While childhood conduct and emotional problems were associated with few of the social and life satisfaction outcomes, the former were negatively associated with educational and occupational attainment, and positively with divorce, whereas the latter were negatively associated with being married.

Conclusions—Prospectively rated childhood wellbeing has long-term beneficial links to adult functioning; our results also support the view that positive wellbeing has a unique impact on these outcomes, and does not merely represent the absence of mental ill-health.

Correspondence to Marcus Richards PhD, MRC Unit for Lifelong Health and Ageing, 33 Bedford Place, London WC1B 5JU, UK. Tel: +44 (0)207 670 5710; www.nshd.mrc.ac.uk.

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Introduction

While we know a great deal about the continuity between childhood mental health problems and outcomes in adulthood, we know very little about the continuity between childhood well-being or positive mental health and outcomes in adult life. Troubled children are likely to become troubled adults but how likely are happy, well-adjusted children to flourish in adulthood? In this paper, we address this question using data from a unique longitudinal study in which a representative population sample of children born in 1946 in the UK have been followed up into midlife. Information about positive aspects of well-being is available for this cohort from their early teenage years and at follow-ups when they were 36, 43 and 53 years old. The present study was informed by longitudinal research on continuities in mental health problems, and also by research (mainly cross-sectional) concerning the characteristics and behaviours of happy adults. Accordingly, both literatures are briefly reviewed.

An authoritative review by Rutter, Kim-Cohen & Maughan (2006) presents a body of evidence showing that emotional and conduct problems in childhood show continuities with adult problems. For example, these authors estimated that depressed adolescents have a 2 – 7 times greater chance of becoming depressed in adulthood. Conduct problems or anti-social behaviour in children also predict poor mental health and social functioning in adulthood, with a significant causal impact on crime, substance misuse, and suicide (Ferguson, Horwood & Ridder 2005; Moffitt, Caspi, Harrington & Milne, 2002). Childhood and adolescent mental health problem also have a significant impact on adult life chances. Depression in childhood is associated with poor educational attainment, prolonged unemployment, early parenthood, nicotine dependence and alcohol abuse (Ferguson & Woodward 2002). However, all these effects could be accounted for by a range of other factors including socio-economic background, early adversity and adolescent neuroticism. With respect to the long-term consequences of childhood conduct problems, it has been shown that the higher the number of conduct problems, the higher the proportion of no or vocational only educational qualifications, unemployment, welfare dependency in adulthood, and low income, although the strength of these associations was reduced when controlling for early adversity and IQ (Ferguson, Horwood & Ridder, 2005; Richards & Abbott, 2009).

Childhood cognitive ability has also been linked to later mental health problems (Batty, Mortensen & Osler 2005; Feinstein & Bynner 2004; Gale, Hatch, Batty & Deary, 2009; Hatch, Jones, Kuh, Hardy, Wadsworth & Richards, 2007; Van Os, Jones, Lewis, Wadsworth & Murray, 1997).

A characteristic of the child which is strongly related to mental health problems both in childhood and adulthood, is personality. Both cross-sectional and longitudinal studies find that high levels of neuroticism (negative affectivity or emotional instability) are linked to the development of mental health problems such as anxiety and depression (Caspi, Moffitt, Newman & Silva (1996); Jones (2001), Kendler, Gatz, Gardner & Pedersen (2006); Rodgers (1990); van Os, Park (2006). Evidence for a link between extroversion and mental health problems is less robust, and in some studies even absent; Clarke, Watson & Mineka (1994); Neeleman, Ormel & Bijl (2001); van Os, Park, Jones (2001).

We turn now to we know about the demographic and social factors associated with happiness or well-being in adults. The vast majority of data have come from large economic and social surveys which include single-items measures of happiness or life satisfaction (see review by Dolan, Peasgood & White 2008); and there have also been a few population-based studies which incorporate a broader range of measures of well-being or positive

mental health. The latter are exemplified by the European Social Survey (ESS; Round 3 $n = 43,000$; Huppert, Marks, Clark, Seigrist, Stutzer, VittersØ, & Wahrendorf, 2009), the National Population Health Survey in Canada ($n \sim 18,000$; Stephens, Dulberg, & Joubert 1999), the British Health and Lifestyle Survey ($n \sim 6,000$; Huppert and Whittington, 2003), and the National Survey of Midlife Development in the United States – MIDUS ($n \sim 3,000$; Ryff & Singer, 1999). Taken together, these diverse surveys provide a broad picture of the association between socio-demographic factors and well-being which can be briefly summarised as follows.

Gender, which is known to be strongly related to psychological disorder with higher prevalence among women, often has little association with positive well-being, although in some studies men tend to have better scores (Stephens et al, 1999); while in others, women do better than men but only on measures which reflect social functions (e.g Huppert et al 1999????; Ryff and Singer 1998). With respect to age, when well-being is measured by happiness or life satisfaction, it typically follows a U-shaped function, being lowest in midlife (e.g. Blanchflower and Oswald (2008); Yang Yang, (2008); but this pattern varies considerably when a wider range of well-being measures is used (e.g Huppert et al 2009, Stephens et al 1999, Ryff and Singer 1998). Education usually shows a positive relationship with well-being, although Diener, Suh, Lucas & Smith (1999) cautioned that most of this relationship can be explained by the fact that more highly educated people tend to have higher income, better health and more social contacts, and that once these factors are controlled, the relationship tends to diminish or even disappear. All studies report a positive association between income and well-being, although the strength of this effect diminishes at higher levels of income (e.g. Layard 2003). Married people generally tend to have higher well-being than non-married people, but there is evidence of reverse causality, i.e. that happier people are more likely to get married (Lucas et al, 2003). This 15-year longitudinal study by Lucas et al (2003) also found high variability in individuals responses to marriage, with some people becoming more happy and some less happy over time.

All the survey evidence shows that social factors have a much greater effect on well-being than do demographic factors or income. Social support, social contact, the number of social roles, and engagement in social or communal activities are all strongly associated with well-being (Diener et al 1999, Halpern, 2009; Helliwell, 2003). Recent research indicates that pro-social behaviour, i.e. what we do for others or give to others, has a particularly strong impact on well-being. This has been demonstrated not only in cross-sectional studies (e.g. Dolan et al, 2008; Meier and Stutzer, 2008; Musick & Wilson, 2003; Plagnol & Huppert 2010) but has also been demonstrated experimentally. In one interesting experiment, participants who were given a sum of money and told to spend it on someone else, showed higher happiness scores than those who were instructed to spend it on themselves (Dunn, Aknin & Norton 2008). Social relationships appear to have a dual influence on well-being: a direct effect which is probably related to our evolutionary origin as social animals, and an indirect impact which involves buffering the effects of stress on behaviour and physiological function (House et al, 1988).

Another factor which is strongly linked to adult well-being is personality, and there have been a number of major reviews of the association between personality and measures of subjective well-being (Costa & McCrae, 1980; DeNeve & Cooper, 1998; Diener & Lucas, 1999; Gutierrez, Hernandez, Jimenez & Puente, 2005; Helliwell & Putnam, 2005). Extraversion and neuroticism appear to be the two personality dimensions most strongly associated with individual differences in subjective well-being. In general, extraversion has been regarded as more important than neuroticism in explaining variations in positive affects and life satisfaction, where as neuroticism is strongly linked to negative affect (e.g. Argyle & Lu (1990); Costa & McCrae (1980); Diener & Larsen (1993) . Personality has also been

linked to a aspect of well-being called 'Psychological Well-being', which focuses on how well the individual functions and not just how they feel using Ryff's scales of psychological well-being (Ryff 1989; Ryff & Keys 1995) Schmutte and Ryff (1997) found that all six of Ryff's dimensions of psychological well-being were positively associated, but the magnitude of the correlations were markedly reduced after controlling for current affect.

The vast majority of studies examining the association between adult well-being and personality have been cross-sectional, all conducted over very short time periods. In the longest prospective study to date, Abbott and her colleagues have shown that the personality traits extroversion and neuroticism impact upon psychological well-being three decades after personality measurement in adolescent and young adulthood (Abbott, Croudace, Ploubidis, Kuh, Wodsworth, Richards & Huppert 2006). They found that extroversion exerted a direct effect on well-being, but the effect of neuroticism was mediated almost entirely through emotional problems. That is, once emotional problems across the life course were controlled, the effect of neuroticism on well-being was negligible.

The specific aim of the present study was to establish whether children whose characteristics had been positively rated by their teachers when they were teenagers, were more likely to have high levels of well-being and social and occupational functioning later in life. Since high midlife well-being could arise from a variety of other factors, such as a favourable early environment, favourable IQ or socio-economic circumstances in adult life, we took account of these factors. We looked both at specific outcome measures of subjective well-being (e.g. life satisfaction) and broader measures of positive outcomes, namely social, educational and occupational functioning. We examined the impact of childhood well-being on three types of outcomes: objective socio-demographic outcomes (educational attainment, midlife social class, marital status), psychological outcomes (satisfaction with work, satisfaction with family, attainment of life goals) and social outcomes (social contacts, social activities, pro-social behaviour, leadership activities). Since many of these positive outcomes could derive simply from the absence of mental health problems in mid-life, we also tested whether mental health problems showed associations with these outcomes in the opposite direction, or were simply absent.

Method

Sample

Participants were drawn from the Medical Research Council (MRC) National Survey of Health and Development (NSHD), a birth cohort study stratified by social class and initially consisting of 5362 people selected from all births that occurred in England, Scotland and Wales during one week in March 1946 (Wadsworth, Kuh, Richards & Hardy 2006). Information about socio-demographic factors and medical, cognitive and psychological function has been repeatedly obtained by interview and examination, most recently in 1999 at age 53 years, when sample size was 3035. At this time the cohort was shown still to be a representative sample, in most respects, of the UK population singly born within marriage in the immediate post-war era. Exceptions were an over-representation among non-responders of the never married and the least advantaged in terms of cognitive ability, educational attainment, and social class. Ethical approval for this study came from the North Thames Multicentre Research Ethics Committee.

Childhood mental well-being

Identification of childhood positive well-being was based on teacher ratings when survey members were aged 13 and 15 years, using a forerunner of the Rutter A scale (Rutter, 1967). Four of these items allowed positive ratings: 'very popular with other children' (age 13

years only), 'unusually happy and contented', 'makes friends extremely easily' and 'extremely energetic, never tired' Each of these items was scored as 1 representing the relevant positive rating and 0 representing a relevant average or negative rating. These ratings were summed (maximum = 7) and grouped into none, one and more than one, which yielded one large group with no positive ratings, and two modest and approximately equal sized groups, respectively.

Teachers also rated conduct and emotional problems. Items for the former referred to unpunctuality, restlessness, truancy, daydreaming, indiscipline, disobedience and lying. Items for emotional problems referred to anxiety, timidity, fearfulness, diffidence and avoidance of attention. Summary measures of conduct and emotional problems were created by deriving global measures for each from factor analysis (using the statistical package Mplus, which allows for item-level missing data), then dividing scores for these into absent, mild and severe based on established percentile cuts Colman, Murray, Abbott, Maughan, Kuh, Croudace & Jones 2009), (Ghodsian, Fogelman, Lambert & Tibbenham, 1980; Ghodsian (1983); Rodgers, (1990). For conduct problems these were 0-75%, 75-93% and 94% or higher, respectively; and for emotional problems these were 0-50%, 50-87% and 88% or higher, respectively.

In addition, at age 16 survey members completed six extraversion (E) items from the short Maudsley Personality Inventory (Eysenck, 1958), reflecting sociability, energy, and activity. This dimension was previously shown to be associated with adult psychological well-being in NSHD (Abbott et al., 2008). A simple median split was used to define high and low E.

Outcomes

1. Socio-demographic Outcomes

1a. Educational and occupational attainment: The highest educational qualifications or their training equivalents attained by age 26 were classified as none, vocational only, ordinary secondary ('O' levels), advanced secondary ('A' levels), or degree level or equivalent. Current or last occupational social class at age 43 was classified according to the Registrar General.

1b. Marital Status: At age 53 years survey members were classified as having never or ever been married, regardless of subsequent divorce or separation. At the same age survey members were also classified as being married once versus having been divorced at least once.

2. Psychological Outcomes

2a. Mental Health: Symptoms and ratings of anxiety and depression were classified into six profiles derived from assessments at ages 13, 15, 36, 43 and 53 years (Colman et al., 2007). Those at ages 13 and 15 years were based on items from the teacher rating scales described above. Those at ages 36, 43 and 53 years were rated using a short version of the Present State Examination (PSE); wing, the Psychiatric Symptom Frequency scale, and the Gerard Hedith Questionnaire (GHQ-28; Goldberg & Hillier 1979), respectively. Latent class analysis was used to derive six longitudinal profiles from these data, representing 1. absence of symptoms/behaviours; 2. repeated moderate symptoms; 3. adult-onset moderate symptoms; 4. adolescent-onset symptoms with good adult outcome; 5. adult-onset severe symptoms; and 6. repeated severe symptoms (see Colman et al., 2007 for details). These profiles were reordered by severity to create a three-level outcome variable: no lifetime symptoms; moderate (repeated, adult onset or adolescent onset with good adult outcome); and severe (repeated or adult onset).

2b. Life satisfaction: At age 36 years survey members were asked if, on the whole, life had been good to them, coded as a yes/no binary variable

At age 43 years survey members were asked how satisfied they were with what they had accomplished at work. Answers were dichotomised to 'fairly satisfied' or more vs. 'neither satisfied nor dissatisfied' or less. Survey members were also asked if they felt they had achieved all they were likely to in working life, or had further ambitions for the future. Answers were dichotomised to 'nothing more to achieve' vs. 'something' or 'much more' to achieve. These ratings were combined into one dichotomous variable, with a positive outcome coded as at least fairly satisfied and with at least something to achieve.

At age 43 years survey members were asked similar questions about satisfaction with family life and further ambitions for the family, and a similar summary variable was derived.

At age 53 years survey members were asked about work satisfaction. For distributional reasons answers were recoded into 'very happy' with the present (or last) job versus 'fairly happy', 'not very happy' or 'unhappy'.

3. Social Outcomes

3a. Social contact: At ages 36 and 43 years survey members were asked about the frequency of their social contact. Specifically, at age 36 they were asked to state how often they had friends spend the evening, or time at the weekend, with them at home; answers were dichotomised into once a week or more often versus less than this. At age 43 years they were asked how often, on average, they met friends or relatives socially; answers were dichotomised to 6-10 times per month versus less than this. The overall social contact variable was coded as 0 (answers in the lower category at both ages), 1 (an answer in the higher category at one age) or 2 (answers in the higher category at both ages).

3b. Social activities: At ages 36 and 43 years survey members were asked about participation in a range of social activities. These are summarised in Table 1.

At ages 36 and 43 years survey members were asked about participation in the following social activities: chess, bridge or similar games (age 36 only); church or religious activities (36 and 43 years); going to the cinema, theatre or concerts (age 36 only); going to the pub or club (age 36 years; sports club at 43 years); club, playgroup, or school (36 and 43 years, also helping to run any of these at 36 years); local government, trade union, or political work (36 and 43 years); playing a musical instrument with others (age 36 years); voluntary work (ages 36 and 43 years); evening classes/adult education (age 43 years); and 'other' organisations (age 43 years).

Survey members were classified into those who engaged in none, one or more than one of these social activities on at least a weekly basis, at either age.

3c. Pro-social and Leadership activities: A subset of these items was also chosen to represent pro-social activity. At 36 years these were 'Helping to run a club, playgroup or school', 'Local government, trade union or political work' and 'Voluntary social welfare work'. At 43 years these were 'Playgroup, nursery or school', 'Local government', 'Trade unions' and 'Voluntary services'. Because few survey members engaged in more than one such activity (N = 61) this variable was dichotomised into those who engaged in none versus any of these pro-social activities on at least a weekly basis, at either age. Finally, at ages 36 and 43 years survey members were asked if they helped to run any of the social activities. Leadership was defined as running none, one or more than one of these social activities, including (as for pro-social activity) 'Helping to run a club, playgroup or school' at 36 years.

4. Covariates

4a. Socio-economic status (SES) of origin: SES of origin was represented by father's social class when survey members were aged 11 years or, if unknown, 4 or 15 years, as well as mother's education. Father's social class was classified as professional, managerial, intermediate, skilled manual, semi-skilled manual or unskilled, according to the Registrar General, and dichotomised as non-manual versus manual. Mother's education was indicated by eight categories (e.g., primary school only, secondary school only, secondary school and qualifications/degree). These categories were recoded into two response categories: 0= primary school only and 1= secondary school or any training/qualifications.

4b. Childhood cognition: At age 15 years survey members took three tests of cognitive function (Pigeon, 1968): the Heim AH4 test (Heim, 1970), a 130-item test requiring shape matching and selection, and verbal and number problems, yielding scores for Verbal Intelligence and Non-verbal Intelligence; the Watts-Vernon Reading Test, a 35-item test of reading comprehension requiring the participant to select an appropriate word to complete a sentence; a 47-item mathematics test, requiring the use of arithmetic, geometry, trigonometry and algebra.

4c. Educational and occupational attainment: Adult socio-demographic characteristics (educational and occupational attainment, marital status) were also used as covariates in the analysis. Details of their measurement were presented earlier when they were considered socio-demographic outcomes.

Statistical methods

Univariate associations between predictors, covariates and outcomes were tested by ANOVA or Chi Square, as appropriate. Multivariate regression models were used to test associations between the predictor variables (positive child ratings and high Extraversion) and the outcomes. For continuously distributed outcomes (GHQ-28) linear regression was used; for numbered ordinal (0, 1 or 2) outcomes polytomous regression was used; for binary outcomes logistic regression was used. For all three types of model, analyses were initially adjusted for gender only, then additionally adjusted for father's social class, childhood cognitive ability, educational attainment, and midlife social class. To test whether any significant effects of being a positive child merely represented the absence of negative mental health, these analyses were repeated substituting the positive predictors for the variables representing childhood conduct and emotional problems.

Results

Sample size, when selected for non-missing data on all predictor variables and covariates, was 2,776. Those who were missing any outcome data were less likely than those with complete data to have been rated as a positive child ($p < 0.001$), and more likely to have childhood conduct problems ($p < 0.001$) although they were not significantly different with regard to Extraversion and childhood emotional problems. Those who were missing any outcome data were also more likely to be of manual social class origin ($p = 0.006$), to have not achieved advanced education ($p < 0.001$), and to be in an adult manual occupation ($p < 0.001$).

Table 2a shows inter-associations between the childhood mental health measures. The likelihood of having a high Extraversion score showed a graded increase across the three categories of 'positive child'. As expected, there was a strong graded decrease across these categories in the likelihood of being rated as having emotional problems at the same age.

However, there was no association between being a positive child and having concurrent conduct problems.

For reference, Table 2b shows how positive child ratings are distributed across these with high Extraversion and childhood mental health problems. As expected, only a small percentage of those with emotional problems have positive child ratings (18.2% one rating; 8.9% two or more), but almost half of those with conduct problems or high Extraversion have one or more positive child ratings (42.4% and 46.2% respectively).

Table 3 shows associations between being a positive child and the covariates. Positive children were significantly more likely to be male; to be of non-manual origin; to have higher childhood cognitive ability; to have attained advanced educational qualifications; and to be in a non-manual occupation in midlife.

Table 4 shows associations between being a positive child and the adult mental health and social activity outcomes. There was a highly significant inverse gradient between number of positive childhood ratings and having a moderate or severe life course emotional profile. Children who had no positive ratings had a 64.7% chance of moderate or severe emotional problems during their life, compared to 37.7% in children who had two or more positive ratings. Positive children also had significantly higher mean scores for work satisfaction at 43 years, frequency of social contact and engagement in social activities. Effects for family satisfaction, marital status, pro-social and leadership activities were not significant at the 5% level.

Table 5 shows ordinal regression coefficients for the psychological outcomes, representing differences in severity of life course emotional profiles and life satisfaction in relation to the childhood predictors. There was a strong inverse association between number of positive child ratings and odds of an increasingly severe life course emotional profile, before and after adjustment for the covariates. Children with one positive rating were 25% less likely to have mental health problems across their life course, and children with two or more positive ratings were 61% less likely to have such problems, compared to children with no positive ratings. Similar associations were observed for high Extraversion. While there were no associations between childhood conduct problems and later mental health problems, there was, as expected (Richards & Abbott, 2009) a strong association between childhood emotional problems and odds of mental health problems later in life. Children with emotional problems were more than four times as likely as others to have a moderate or severe mental health problem.

Table 5 also shows the regression results for the other psychological variables, namely life satisfaction at different ages. Being a positive child was significantly associated with work satisfaction and ambition at age 43, and with work satisfaction at age 53 years. Extraversion was associated with general life satisfaction at 36 years, and with family satisfaction and ambition at 43 years. Adjustment for the covariates had little effect on these associations, with the exception of the removal of a dose-response effect for work satisfaction at 43 years. There were no significant independent associations between childhood mental health problems and these life satisfaction outcomes.

Table 6 shows the results of logistic regression, with odds ratios representing likelihood of attaining advanced qualifications by 26 years, being in a non-manual occupation by 43 years, and of having been married or divorced by 53 years. There was a modest suggestion of a positive dose-response effect of number of positive child ratings and educational and occupational attainment, but these associations were explained by the covariates. There was no association between being a positive child and odds of becoming married. However – and surprisingly – those who had received more than one positive rating as a child were, once

married, more likely to divorce than the other survey members. There was modest evidence that high Extraverts were more likely to marry than those with lower Extraversion scores, even after full adjustment for the covariates. However, there were no independent associations between Extraversion and educational and occupational attainment.

Consistent with previous work in this cohort (Richards & Abbott, 2009), children with conduct problems had strongly lower odds of obtaining advanced educational qualifications and being in a non-manual occupation in midlife than children without these problems, after adjusting for the covariates. Childhood conduct problems were also modestly and independently associated with increased likelihood of being married in midlife, but, with likelihood of divorce. On the other hand, children with emotional problems were significantly less likely to marry than those without these problems. Childhood emotional problems were not associated with educational or occupational attainment.

Table 7 shows the results of ordinal and logistic regression, with odds ratios representing likelihood of a greater level of social activity with respect to the childhood predictors. Tests of parallelism were non-significant for all fully adjusted ordinal models, suggesting comparable effects for each outcome level. While there were no significant effects in regard to receiving one positive rating, those who had received at least two positive ratings were nearly 40% more likely than those who had received none to have more frequent contact with friends or family, and to be more regularly engaged in social activities. However, there were no effects for pro-social or leadership activities, and this was still the case when leadership activities were re-classified as pro-social activities and analyses re-ran for the latter. High Extraverts were approximately 30% more likely than those of lower Extraversion to engage in more frequent social activities, but there were no other significant effects for this predictor. The strength of these associations was not substantially changed by adjustment for the covariates. There were no independent associations between childhood mental health problems and these outcomes, with the single exception of an inverse association between emotional problems and frequency of social contact with friends and family.

Associations between 'positive child' and the outcomes, where significant, were not substantially attenuated by additional adjustment for Extraversion (not shown), with the single exception of the divorce outcome, where the effect was pushed just below conventional significance ($p = 0.06$). This suggests that the positive teacher ratings are an independent entity and are not merely an aspect of this personality trait. This mutual adjustment also preserved significant associations for Extraversion, with the exception of general life satisfaction at 36 years, which was no longer significant.

Discussion

In this longitudinal population-based cohort study, children who were rated by teachers as being 'positive' at ages 13 or 15 years, were significantly more likely than those who received no positive ratings to report satisfaction with their work in midlife, have regular contact with friends and family, and engage in regular social activities. Positive children were also much less likely to have a mental health problem throughout their lives. Those with one positive childhood rating were 25% less likely, while those with two or more positive ratings were 61% less likely to develop emotional problems compared to those with no positive ratings. Almost two thirds (62.3%) of children with two or more positive ratings had developed no mental health problems by age 53 compared with only one third (35.3%) in the group with no positive ratings. These associations were independent of a range of potential confounders, including childhood social class, childhood cognitive ability, extraversion, and educational and occupational attainment. On the other hand, children rated

as positive were not significantly more likely to be satisfied with their family life, or to report higher levels of pro-social activities or leadership roles.

Importantly, the associations between being a positive child and positive adult outcomes did not merely represent the absence of mental health problems. There were no significant associations between childhood conduct or emotional problems as rated by teachers, and these adult well-being outcomes, apart from the association between childhood emotional problems and a reduced likelihood of having contact with family or friends.

Based on our earlier literature review of the environments and characteristics which lead to continuities in mental health problems, as well as our review of the factors associated with high levels of well-being in adults, we hypothesized that positive wellbeing in children would be associated with higher educational attainment, higher occupational status, and a greater likelihood of being and staying married. Although there was some support for this in unadjusted models, once the models had been adjusted for possible confounding factors, there was no significant relationship between childhood well-being and education, occupation or marital status. This is an interesting finding, since there is overwhelming evidence that poor mental health in childhood is associated with difficulties in all three areas (refs to be added). These findings add support to the idea that positive well-being is not simply the absence or opposite of mental health problems (e.g. Huppert and Whittington, 2004).

Our findings also advance knowledge on continuities between childhood mental health problems and later adult outcomes, in that we have examined positive outcomes rather than the negative outcomes which are the focus of virtually all the existing literature (see review by Rutter, et al. 2006; and Richards & Abbott 2009). There have been many longitudinal studies of the long-term consequences of childhood emotional and conduct problems, which show a substantially increased likelihood of later mental ill-health, as well as difficulties in educational attainment, employment and social relationships (e.g. Bynner et al 2000, Caspi 2002, Ferguson et al 2005, Ferguson & Woodward 2002). If positive well-being outcomes simply represented the absence of problems, we would expect the group of children who were rated as having conduct or emotional problems to do poorly in our well-being measures. This was the case on a number of measures including work and family satisfaction, contact with friends and family, social activities, but only in the unadjusted model. When we adjusted for a range of possible confounding factors, the only significant finding was the low level of contact with friends or family in cohort members who had been rated as having emotional problems in childhood.

It is important to note that the categories positive child, conduct problems and emotional problems are not mutually exclusive. Table 2 shows that among the children with two or more positive ratings (23.8%) almost a quarter were also classified as having a conduct problem or an emotional problem (22.7%). The percentage with an emotional problem increased as the number of positive ratings decreased but there was no relationship between the number of positive ratings and the presence of a conduct problem. The finding that midlife wellbeing is unaffected in children rated as having conduct problems is very interesting. It probably reflects the fact that the conduct problems identified in this study were relatively mild, and very few of the children would be diagnosed with conduct disorder.

In spite of the mildness of the conduct problems in this study, we confirmed the finding that this group had lower educational and occupational attainment in midlife, despite adjustment for a wide range of confounders, as previously shown by Ferguson et al, 2005, Richards & Abbott, 2009. We also confirmed that the group with conduct problems continues to have

some difficulty with relationships, i.e. although they were significantly more likely to be married they were also more significantly more likely to be divorced (Richards & Abbotts, 2009). Despite the lower educational and occupational attainment of the group with conduct problems and their greater likelihood of being divorced, they did not differ significantly from the 'positive child' group in terms of life satisfaction or social activities.

A very surprising finding of the study was that while positive children are no more likely to get married than other cohort members, they are significantly more likely to get divorced. The explanation for this is not immediately obvious and warrants further investigation. One possible factor might be that positive children have higher self-esteem or self efficacy than their peers and are therefore more willing to leave a marriage if it is not meeting their needs.

The study has also provided some insight into the relationship between the personality dimension extraversion, and positive teacher ratings. There was certainly an association between high extraversion and positive child ratings (see table 2), but there were also some differences in outcome: in social contact (a weaker association than with positive teacher ratings, in being married and with general life and family satisfaction (stronger associations). Importantly, when regression analyses included extraversion as a covariate, the pattern of associations between positive child and outcome variables remained the same.

The strengths of this study include the large size and representativeness of this population-based sample, the prospectively obtained information on well-being, mental health and social functioning across a large section of the life course, and data on a comprehensive set of potential confounders. Among the study's limitation are the disproportionate loss to follow up of survey members who were relatively more disadvantaged, although we have no reason to believe that this would significantly alter the pattern of association we report. A further limitation, common to all long-term studies, is that they were often not designed to answer the questions which are later addressed: hence the survey items are not always optimal, and one has to make do with the items that are available. However, within these constraints, we believe we have shown some important continuities between being a positive child and later well-being outcome, as well as some instances where there appears to be no evidence for continuity.

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Table 1**Social activities at ages 36 and 43 years** (Items in *Italics* indicate pro-social activities)

Age 36 years	Age 43 years
Chess, bridge or similar games	Church activities
Church or religious activities	<i>Playgroup, nursery, or school</i>
Going to the cinema, theatre or concerts	<i>Local government</i>
Going to the pub or club	<i>Trade union</i>
<i>Helping to run a club, playgroup, or school</i>	<i>Voluntary services</i>
<i>Local government, trade union, or political work</i>	Sports clubs
Playing a musical instrument with others	Evening classes/adult education
<i>Voluntary social welfare work</i>	Other organisations

Table 2a

Percentage of survey members in each positive child category who had high Extraversion and childhood mental health problems

Variable	No positive ratings	One positive rating	Two or more positive ratings
N	1645	593	538
High Extraversion (%)***	38.8	45.9	51.5
Adolescent conduct problems (% any)	22.3	23.9	23.8
Adolescent emotional problems (% any)***	61.1	42.3	22.7

p < 0.001

Table 2b

Percentage of survey members with high Extaversion or childhood mental health problems in each positive child category

Variable	No positive ratings	One positive rating	Two or more positive ratings
N	1645	593	538
High Extraversion (%)***	53.8	22.9	23.3
Adolescent conduct problems (% any)	57.6	22.3	20.1
Adolescent emotional problems (% any)***	72.9	18.2	8.9

p < 0.001

Table 3

Descriptive statistics for the covariates in relation to being a positive child

Variable	No positive ratings	One positive rating	Two or more positive ratings
N	1,645	593	538
Gender (% female) *	52.6	46.5	48.46
Childhood social class (% manual) *	60.1	61.6	54.3
Mother's education (% with qualifications) *	8.0	9.1	12.1
Childhood cognition (mean and SD) ***	38.1 (11.0)	37.4 (11.0)	39.9 (10.4)
Educational attainment (% advanced qual.) *	33.7	34.1	39.8
Midlife social class (% manual) **	37.5	37.1	29.0

*
p < 0.05**
p < 0.01***
p < 0.001

Table 4

Descriptive statistics for the outcomes in relation to being a positive child (means and SDs, or percentages)

Variable	No positive ratings	One positive rating	Two or more positive ratings
Life course emotional profile (% moderate or severe) ***	64.7	45.8	37.7
Life good at age 36 (%)	94.9	95.6	96.0
Satisfied with work (43 years) (%) *	56.6	64.5	64.8
Satisfied with work (53 years) (%)	36.3	38.1	41.6
Satisfied with family (43 years) (%)	68.8	72.3	72.1
Never married (by 53 years) (%)	5.9	6.6	5.1
Ever divorced (by 53 years) (%)	16.5	16.3	20.4
Social contact *	0.56 (0.78)	0.63 (0.8)	0.68 (0.83)
Social activities **	0.56 (0.78)	0.58 (0.79)	0.69 (0.82)
Prosocial behaviours (none vs. 1 or more)	0.59 (0.79)	0.65 (0.80) ^I	
Leadership activities	0.59 (0.79)	0.64 (0.80)	0.62 (0.81)

Social contact, social activities, pro-social and leadership variables sum to a maximum of 3.

^I The total number in each of those groups who reported a pro-social activity at least once a week was small, so the groups were combined on this variable*
p < 0.05**
p < 0.01***
p < 0.001

Table 5

Unadjusted and adjusted regression coefficients (Odds Ratios) and 95% confidence intervals representing associations between childhood mental health and adult mental health problems, and life satisfaction

		Unadjusted (gender only)		Fully adjusted ^a	
		Odds Ratio	p	Odds Ratio	p
Life course emotional profile (absent, moderate or severe)	Positive child b_1	0.75 (0.58, 0.98)	0.04	0.79 (0.60, 1.03)	0.08
	2	0.39 (0.32, 0.49)	<0.001	0.40 (0.32, 0.50)	<0.001
	High Extraversion	0.73 (0.62, 0.86)	<0.001	0.75 (0.64, 0.89)	0.001
	Conduct problems	1.07 (0.88, 1.31)	0.48	1.00 (0.82, 1.23)	1.00
	Emotional problems	4.14 (3.47, 4.94)	<0.001	4.08 (3.41, 4.87)	<0.001
Life satisfaction (age 36 years)	Positive child b_1	1.21 (0.73, 2.02)	0.46	1.27 (0.76, 2.12)	0.37
	2	1.30 (0.75, 2.23)	0.35	1.22 (0.70, 2.11)	0.49
	High Extraversion	1.34 (1.04, 1.74)	0.03	1.32 (1.01, 1.71)	0.04
	Conduct problems	0.78 (0.58, 1.05)	0.10	0.80 (0.59, 1.09)	0.15
Work satisfaction and ambition (age 43 years)	Emotional problems	0.87 (0.67, 1.12)	0.28	0.88 (0.68, 1.14)	0.88
	Positive child b_1	1.31 (1.04, 1.65)	0.02	1.34 (1.04, 1.71)	0.02
	2	1.44 (1.13, 1.84)	0.003	1.30 (0.98, 1.64)	0.07
	High Extraversion	1.20 (1.00, 1.44)	0.06	1.16 (0.96, 1.42)	0.13
Family satisfaction and ambition (age 43 years)	Conduct problems	0.67 (0.53, 0.83)	<0.001	0.85 (0.67, 1.09)	0.20
	Emotional problems	0.86 (0.71, 1.04)	0.11	0.95 (0.78, 1.16)	0.62
	Positive child b_1	1.12 (0.88, 1.43)	0.35	1.14 (0.89, 1.46)	0.30
	2	1.14 (0.88, 1.47)	0.32	1.09 (0.84, 1.41)	0.53
Work satisfaction (age 53 years)	High Extraversion	1.32 (1.08, 1.60)	0.006	1.29 (1.06, 1.58)	0.01
	Conduct problems	0.75 (0.60, 0.95)	0.02	0.89 (0.70, 1.13)	0.34
	Emotional problems	0.78 (0.64, 0.95)	0.02	0.84 (0.69, 1.03)	0.09
	Positive child b_1	1.08 (0.85, 1.38)	0.52	1.09 (0.85, 1.39)	0.50
	2	1.30 (1.01, 1.66)	0.04	1.29 (1.00, 1.66)	0.05
	High Extraversion	1.05 (0.86, 1.27)	0.64	1.04 (0.86, 1.27)	0.68
	Conduct problems	1.03 (0.82, 1.30)	0.81	1.02 (0.80, 1.29)	0.89
	Emotional problems	0.99 (0.82, 1.20)	0.89	0.98 (0.81, 1.19)	0.86

^a adjusted for gender, father's occupational social class, mother's education, adolescent cognitive ability, own educational attainment, and own midlife occupational social class

^b one positive rating and two or more positive ratings compared to no positive ratings (reference group)

Table 6

Unadjusted and adjusted regression coefficients (Odds Ratios) and 95% confidence intervals representing associations between childhood mental health and education, occupational attainment, and marital status

	Unadjusted (gender only) ^a		Fully adjusted ^a	
	Odds Ratio	P	Odds Ratio	P
Advanced education				
Positive child ^b ₁	1.01 (0.81, 1.26)	0.93	1.09 (0.83, 1.44)	0.54
2	1.26 (1.00, 1.58)	0.05	1.02 (0.76, 1.35)	0.92
High Extraversion	0.97 (0.81, 1.16)	0.97	0.91 (0.73, 1.13)	0.38
Conduct problems	0.38 (0.30, 0.48)	<0.001	0.55 (0.41, 0.74)	<0.001
Emotional problems	0.91 (0.76, 1.09)	0.31	1.04 (0.84, 1.30)	0.71
Non-manual social class (by 43 years)				
Positive child ^b ₁	0.98 (0.79, 1.22)	0.87	1.04 (0.81, 1.34)	0.76
2	1.42 (1.12, 1.89)	0.004	1.25 (0.95, 1.64)	0.10
High Extraversion	1.27 (1.06, 1.52)	0.008	1.19 (0.97, 1.46)	0.09
Conduct problems	0.48 (0.39, 0.58)	<0.001	0.72 (0.57, 0.91)	0.005
Emotional problems	0.87 (0.73, 1.04)	0.12	0.96 (0.79, 1.18)	0.72
Married (by 53 years)				
Positive child ^b ₁	1.01 (0.61, 1.68)	0.97	1.00 (0.60, 1.67)	1.00
2	1.33 (0.75, 2.37)	0.33	1.31 (0.73, 2.36)	0.36
High Extraversion	1.68 (1.08, 2.60)	0.02	1.57 (1.00, 2.45)	0.05
Conduct problems	1.62 (0.92, 2.83)	0.10	1.80 (1.00, 3.23)	0.05
Emotional problems	0.44 (0.29, 0.69)	<0.001	0.46 (0.29, 0.71)	0.001
Divorced (by 53 years, compared to those in one marriage)				
Positive child ^b ₁	0.98 (0.72, 1.33)	0.89	0.98 (0.72, 1.35)	0.93
2	1.32 (0.98, 1.77)	0.07	1.35 (1.00, 1.82)	0.05
High Extraversion	1.19 (0.94, 1.50)	0.16	1.15 (0.90, 1.47)	0.26
Conduct problems	1.44 (1.10, 1.88)	0.008	1.37 (1.04, 1.82)	0.03
Emotional problems	0.87 (0.68, 1.10)	0.25	0.87 (0.68, 1.11)	0.27

^a adjusted for sex, father's occupational social class, mother's education, adolescent cognitive ability, own educational attainment, and own midlife occupational social class

^b one positive rating and two or more positive ratings compared to no positive ratings (reference group)

Table 7

Unadjusted and adjusted ordinal regression coefficients (Odds Ratios) and 95% confidence intervals representing overall odds of increased social activities with respect to childhood mental health

		Unadjusted (gender only)		Fully adjusted ^a	
		Odds Ratio	p	Odds Ratio	p
Contact with friends or family (at least weekly)	Positive child ^b 1	1.15 (0.90, 1.48)	0.25	1.14 (0.89, 1.46)	0.11
	2	1.38 (1.12, 1.69)	0.002	1.37 (1.12, 1.68)	0.003
	High Extraversion	1.16 (0.99, 1.35)	0.07	1.16 (0.99, 1.36)	0.07
	Conduct problems	1.16 (0.96, 1.40)	0.11	1.18 (0.97, 1.43)	0.10
Social activities(at least weekly)	Emotional problems	0.81 (0.69, 0.94)	0.007	0.82 (0.70, 0.96)	0.01
	Positive child ^b 1	1.20 (0.94, 1.54)	0.27	1.15 (0.90, 1.47)	0.27
	2	1.43 (1.17, 1.76)	0.001	1.37 (1.11, 1.68)	0.003
	High Extraversion	1.32 (1.13, 1.55)	<0.001	1.28 (1.09, 1.50)	0.002
Pro-social (at least weekly)	Conduct problems	1.03 (0.86, 1.24)	0.74	1.19 (0.98, 1.44)	0.08
	Emotional problems	0.85 (0.72, 0.99)	0.04	0.87 (0.74, 1.02)	0.08
	Positive child ^b 1	1.25 (0.98, 1.61)	0.08	1.25 (0.97, 1.62)	0.08
	2	1.25 (0.97, 1.62)	0.09	1.17 (0.90, 1.52)	0.25
Leadership activities	High Extraversion	1.13 (0.92, 1.38)	0.26	1.11 (0.90, 1.37)	0.33
	Conduct problems	0.84 (0.65, 1.08)	0.17	0.90 (0.69, 1.18)	0.46
	Emotional problems	0.87 (0.71, 1.07)	0.19	0.90 (0.73, 1.12)	0.36
	Positive child ^b 1	0.97 (0.79, 1.33)	0.84	0.91 (0.70, 0.84)	0.48
	2	1.17 (0.94, 1.45)	0.15	1.05 (0.84, 1.31)	0.66
	High Extraversion	1.09 (0.92, 1.29)	0.30	1.08 (0.91, 1.28)	0.39
	Conduct problems	0.67 (0.54, 0.83)	<0.001	0.82 (0.66, 1.03)	0.09
	Emotional problems	0.92 (0.78, 1.08)	0.31	0.97 (0.82, 1.16)	0.77

^a adjusted for sex, father's occupational social class, mother's education, adolescent cognitive ability, own educational attainment, and own midlife occupational social class

^b one positive rating and two or more positive ratings compared to no positive ratings (reference group)