# Beliefs about personal change

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## ARTICLE INFO

## ABSTRACT

In all, 510 Europeans completed an online questionnaire rating their beliefs about personal change, including the established Dweck Mindset measure. Their ratings of 27 characteristics from BMI to sexual preference factored into 5 interpretable factors labelled Personality, Beliefs and Habits, Health, Social Status and Physical. Correlation indicated beliefs about change were most related to religious beliefs but also sex and age. Dweck ratings of ability and personality growth were logically related to beliefs about change on the five factors and also to religious beliefs and self-rated optimism. Regressions indicated that being religious was the most consistent predictor about change, as well as age and education. Many beliefs about change were in direct contraction to the academic literature on the topic. Implications and limitations are acknowledged.

## 1. Introduction

Do we change much over time? If so, what features change and why? What are the processes or mechanisms which encourage or inhibit change? We all want to believe that we can change (for the better), but are we deluded? There are a many self-help books that promise to provide the answer of how to change personal behaviour. Indeed, it is the premice of most of these books that (sometimes dramatic and radical) change is possible. They offer simple procedures, "solutions" and processes and often make claims that are not supported empirical research (Lilienfeld et al., 2010; Sala, 1999; Seligman, 2007).

Differential and clinical psychologists have naturally been interested in this issue, particularly over the past 20 years (Ardelt, 2000; Seligman, 2007; Stieger et al., 2021). Clinical psycholgists are usually interested change as a function of therapy (Furnham et al., 2013; Roberts et al., 2006). There also remain studies on what lay people think about change (Furnham, 2015). In this study we examine some of the potential correlates about belief in change such as political and religious optimism, self-esteem and trait optimism which would seem related to beliefs about many types of change.

There is also a debate about whether intelligence can change. Dweck (1986, 2000, 2012), suggested that individuals holding an *entity* theory of intelligence believe that intelligence levels remain constant over a person's lifetime regardless of their education, effort and experience gained. These "*Fixed Mindset*" entity theorists believe that they can learn new things (skills, knowledge), but their underlying intelligence level

essentially never changes. However, *incremental* theorists believe that intelligence can be increased and cultivated over a lifetime through hard work and continued learning. Entity theorists are essentialist with regard to their beliefs about intelligence (Haslam et al., 2004). The whole issue of malleability and immutability of abilities and temperament is at the heart of many psychological debates (Jausovec & Jausovec, 2012; Kuszewski, 2011; Tay & Kuykendall, 2013).

Furnham (2014) looked at the extent to which people believed they could increase their multiple intelligences. He found while Verbal, Naturalistic and Intra-Personal intelligence was seen to be relatively easy to change, Creative and Musical intelligence was seen as much less so. He also found that Core Self-Evaluation and Growth Mindset were both significant positive correlates on beliefs about growing/changing intelligence.

The debate about the equivocal nature of both findings and conclusions regarding personal continuity vs. change revolves around a number of issues. Furnham and Cheng (2015ab) listed a number of these: the reliability and validity of personality tests used (to account in part for measurement error), the moderator variables considered (like sex, education and ethnicity), the age at which people are measured (adolescents, adults, old age), the time span that shows most change and stability, how change is measured (such as mean level change, rank order, ipsative change), the stability of the environments of people and what, if anything, leads to change There is now a growing literature on these issues (Allemand & Flückiger, 2022; Atherton et al., 2021; Baranski et al., 2017, 2021; Boyce et al., 2013; Briley & Tucker-Drob, 2014;

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Cramer, 2003; Damian et al., 2019; Deary et al., 2000; De Vries et al., 2021; Hiten et al., 2021; Hudson et al., 2020; Lucas & Donnellan, 2011; Roberts et al., 2003, 2006; Stieger et al., 2021; Wagner et al., 2019).

The results have similar patterns to them, though there inevitably remains many disagreements (Ardelt, 2000; Conley, 1985; McCrae & Costa, 1994). All agree that there is evidence of *both* stability *and* change. From these studies it may be possible to draw the following conclusions: (1) personality seems most stable between the ages of 30 and 60 years, particularly using established big five measures to assess it, (2) there are modest increases in Emotional Stability and Agreeableness over this period with Extraversion and Neuroticism showing least change (both with a slight decline) and Conscientiousness showing most change (an increase, but curvilear), and (3) males seem more stable than females.

That is, because it is generally accepted that some factors are mostly stable over adulthood (like height), it is assumed that when they are measured is relatively unimportant (i.e., people remain very similar in height from 20 to 60 yrs). It is, however, generally accepted that it is desirable to measure variables according to the causal modeling pattern and also check the reliability of those measures.

In a recent and comprehensive review of personality stability and change, Bleidorn et al. (2021) noted that personality traits were essentially conceptualized as static entities: "The literature on rank-order stability provides strong evidence that individual differences in personality traits are stable across many decades. Stability is highest during middle adulthood and relatively lower during young adulthood and potentially also old age. Notably, stability is only modest over longer intervals, leaving room for personality trait change throughout the lifespan" (p5).

## 2. This study

This study is about beliefs about personal change, which is important both to the academic and clinical literature. We were primarily interested in the correlates of these beliefs looking at demographic factors (sex, age, education), ideological beliefs (religious and political), simple ratings of optimism and self-esteem based on self-ratings. We devised a measure of change which looked at how much 27 characteristics change over time. We also used an established Mindset measure devised by Dweck, used to assess a growth vs fixed mindset for ability and personality. It was essentially an exploratory study, though we did have a few tentative hypotheses: we believed older people (H1), those less religious (H2), more politically conservative (H3), less optimistics (H4) and with lower self-esteem (H5) would be less likely to believe that change can and does occur to themselves and others over time.

### 2.1. Participants

There were 510 European participants, 255 male and 255 female, with an average age of 40.15 (*SD* = 9.19) years. In all, 64 % were university graduates, 38 % were single and 40 % married. Nearly all were in employment in a wide variety of jobs, which they specified, and all fluent in English. They responded to two questions: "How religious are you?" (0 = Not at all to 9 = Very; *M* = 3.80, *SD* = 3.03) and "What are your political views" (1 = Very Conservative to 9 = Very Liberal) (*M* = 5.77, *SD* = 1.78). They also rated how optimistic they were from 1 (Not at all) to 9 (Very) (*M* = 6.35, *SD* = 2.26).

### 2.2. Measures

1. *Beliefs about Change.* This questionnaire, designed for this study, is in three parts. The first is shown in Table 1. Participants are invited to rate on an 11 point scale the extent to which 27 personal attributes of an individual change over their adult life. These were their instructions: *This questionnaire is about how people change over adulthood (21–80 years). Some of us have known people for many years, often*

**Table 1**
Factor analysis of the 20 change questions (1–10; Little to a lot of change).

|  | Mean | SD | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|
| C6 agreeable | 5.49 | 2.33 | 0.70 | 0.21 | 0.03 | 0.06 | 0.05 |
| C2 EQ | 6.79 | 2.12 | 0.68 | 0.03 | 0.01 | 0.26 | −0.08 |
| C7 conscient | 6.17 | 2.32 | 0.67 | 0.30 | 0.07 | 0.08 | −0.08 |
| C3 neurotic | 6.83 | 2.03 | 0.63 | −0.05 | 0.11 | 0.22 | 0.09 |
| C10 resilienc | 5.93 | 2.22 | 0.62 | 0.02 | 0.06 | 0.09 | 0.23 |
| C9 norm pers | 5.11 | 2.32 | 0.57 | 0.29 | −0.04 | 0.02 | 0.08 |
| C5 openness | 4.88 | 2.50 | 0.55 | 0.44 | 0.21 | −0.25 | −0.04 |
| C1 IQ | 6.23 | 2.32 | 0.54 | 0.20 | −0.10 | 0.09 | 0.26 |
| C4 extraver | 5.14 | 2.54 | 0.49 | 0.42 | 0.24 | −0.28 | 0.01 |
| C18 soc skill | 5.92 | 2.28 | 0.49 | 0.49 | 0.11 | 0.30 | −0.06 |
| C23 relig bel | 4.11 | 2.83 | 0.08 | 0.69 | −0.11 | 0.05 | 0.18 |
| C22 polit bel | 5.42 | 2.47 | 0.08 | 0.65 | −0.03 | 0.19 | 0.13 |
| C24 punctual | 4.57 | 2.61 | 0.38 | 0.61 | −0.03 | −0.02 | 0.08 |
| C27 money h | 6.13 | 2.46 | 0.24 | 0.58 | 0.10 | 0.33 | 0.04 |
| C25 tech sav | 5.82 | 2.39 | 0.20 | 0.55 | 0.23 | 0.08 | 0.09 |
| C26 smoke | 4.80 | 2.78 | −0.01 | 0.54 | 0.10 | 0.22 | 0.17 |
| C8 ambit | 5.88 | 2.39 | 0.39 | 0.50 | 0.30 | 0.10 | −0.12 |
| C17 educat | 6.17 | 2.50 | 0.27 | 0.46 | −0.07 | 0.45 | 0.00 |
| C12 phys hea | 6.84 | 2.35 | 0.05 | −0.04 | 0.85 | 0.03 | 0.11 |
| C11 looks | 6.74 | 2.44 | 0.01 | 0.06 | 0.82 | 0.12 | 0.19 |
| C16 sex pref | 6.41 | 2.35 | 0.07 | 0.16 | 0.76 | 0.10 | 0.23 |
| C20 wealth | 6.83 | 1.98 | 0.12 | 0.12 | 0.20 | 0.72 | 0.07 |
| C19 occup | 6.50 | 2.15 | 0.17 | 0.37 | 0.06 | 0.61 | 0.12 |
| C21 hobbies | 6.03 | 2.24 | 0.26 | 0.38 | 0.10 | 0.39 | 0.01 |
| C14 BMI | 6.54 | 2.13 | 0.06 | 0.13 | 0.29 | 0.21 | 0.73 |
| C15 posture | 6.22 | 2.22 | 0.16 | 0.06 | 0.35 | 0.08 | 0.73 |
| C13 height | 3.77 | 3.02 | 0.07 | 0.42 | 0.07 | −0.15 | 0.58 |

Scale: 0 = Little change to 10 = Much change.

*decades, and have noticed both how much and how little they have changed. We are interested in your personal experience **how much** you think **on average** various aspects of people change over adulthood. We have a list of 27 features of individuals: please indicate (where 0 = very little change, to 10 = a lot of change) how much we all change over time.*

The items were taken from different areas: ability (IQ, EQ), personality (Big Five plus ambitiousness, normality, resilience), physical (looks, physical health, height, body shape (BMI), posture, sexiness), social (education, occupation, social skills, wealth, hobbies) beliefs (religious, political) and other (punctuality, technical savvy, attitudes to money, smoking). These were all derived from the literature reviewed in the introduction.

2. *Personal Change.* The second is shown in Table 2 and involves eight questions about personal change, such things as appearance, beliefs

**Table 2**
Thinking about yourself over the last 10 years.

|  | Yes | No | 1 | 2 |
|---|---|---|---|---|
| Have you changed much over this period? | 85.5 % | 14.5 % | 0.79 | −0.01 |
| Do you think there has been quite some change in your… |  |  |  |  |
| Habits | 77.5 % | 22.5 % | 0.58 | −0.13 |
| Beliefs | 45.8 % | 54.2 % | 0.49 | −0.17 |
| Personality | 58.5 % | 41.5 % | 0.57 | −0.16 |
| Health | 70.5 % | 29.5 % | 0.43 | 0.69 |
| Appearance | 74.8 % | 25.2 % | 0.46 | 0.65 |
| Self-confidence | 70.5 % | 29.5 % | 0.63 | −0.18 |
| Emotional intelligence | 73.4 % | 26.6 % | 0.66 | −0.36 |
| Eigenvalue |  |  | 2.744 | 1.134 |
| Variance |  |  | 34.295 % | 14.178 % |

and self-confidence. These reflected the major people categories that are examined in the literature. The response scale was Yes/No. The third involved three specific questions about change (see Table 3). These were based on some of the ideas from Furnham (2015).

3. *Mindset Quiz* (Dweck, 2000, 2012). This is a 20 item questionnaire which had four groups of items: a *Fixed Ability Mindset* (7 items) ($M$ = 19.52, $SD$ = 2.38, Alpha 0.58), a *Growth Ability Mindset* (7 items) ($M$ = 15.34, $SD$ = 2.72, Alpha 0.59), a *Fixed Personality/Character Mindset* (3 items)($M$ = 7.37, $SD$ = 1.63, Alpha 0.68), and *Growth Personality/Character Mindset* (3 items) ($M$ = 6.33, $SD$ = 1.49, Alpha 0.47). These low alphas are typical for the Dweck measure (Furnham, 2014). Each was scored on a 4-point scale (1 = Strongly Agree to 4 = Strongly Disagree). From this an Dweck Ability score was calculated namely, Ability Fixed-Ability Growth ($M$ = 3.33, $SD$ = 4.22), and a Personality score was calculated namely, Personality Fixed-Personality Growth ($M$ = −1.03, $SD$ = 2.57). These scores were correlated ($r$ = −0.60, $p$ < .001).

4. *Self-Esteem.* Participants made four ratings of: Physical Attractiveness (1–100, $M$ = 57.51, $SD$ = 19.85), Physical Health (0–100, $M$ = 65.73, $SD$ = 20.05), Intelligence (1–100, $M$ = 70.17, $SD$ = 14.38) and Emotional Intelligence (1–100, $M$ = 70.54, $SD$ = 17.89). These were combined into a Self-Esteem score with a mean of 263.77 ($SD$ = 56.58) and an Alpha of 0.78.

### 2.3. Procedure

Departmental ethical approval was gained prior to data collection (CEHP/514/207). Data was collected on-line through Prolific, a platform like the better-known Amazon-Turk. Participants were compensated for their time (receiving £1.50). Data cleansing and checking (based on time taken, omissions, patterned responses) led to around 2 % of the 630 recruited being rejected before further analysis. The study was run in December 2021.

## 3. Results

### 3.1. The Growth Questionnaire

Table 1 shows the mean scores and the results of the VARIMAX rotated factor analysis. The three characteristics thought to change least in rank order were height, religious beliefs and punctuality, while those thought to change most were physical health, wealth and emotional intelligence. Height was by far the variable people believed least open to change, though the SD indicated some disagreement, perhaps based in ideas of fitness training.

Various factor analyses were performed: orthogonal and oblique but yieded similar results. The Varimax factor analysis suggested five interpretable factors based on Eigenvalues >1.00. The first contained mostly *personality trait* items, (Eigenvalue 4.76; Variance 23.82 %); the second *social beliefs,* (Eigenvalue 1.81; Variance 9.13 %); the third *physical factors,* (Eigenvalue 1.41; Variance 7.45 %); the fourth *occupation* (Eigenvalue 1.25; Variance 6.28 %); and the fifth *body shape* (Eigenvalue 1.06; Variance 5.30 %). These were combined into five scores with the following alphas: factor 1 Personality (Alpha = 0.85), factor 2 Beliefs and Habits (Alpha = 0.81), factor 3 Health (Alpha = 0.82), factor 4 Social Status (Alpha = 0.69), and factor 5 Physical (Alpha

**Table 3**
People often seek help to change themselves though things like counselling and therapy.

| | Yes | No |
|---|---|---|
| From your observations of others who try it, does it work? | 67.3 % | 32.7 % |
| Do you think you can train an introvert to become an extravert? | 36.0 % | 64.0 % |
| Do you think most people become nicer/kinder as they get older? | 44.4 % | 55.6 % |

= 0.65). Predictably, these factors were highly positively correlated.

Table 2 shows the results from the second part of the questionnaire and indicates that people themselves believed there was "quite some change" in various aspects of their beheviour. This factored into two scores labelled Behavioural and Physical. These were correlated with the five factors (See Table 3).

Table 3 indicates the results to three specific questions which indicated that around 2/3 people think therapy works, but tended not believe that it is possible to change extraversion-introversion, and that people became more agreeable as they got older.

Table 4 showed the correlations between all variables. There were some clear patterns considering correlations with the five change factors. All correlations with religion were significant (0.13 < $r$ < 0.30), showing the more religious people were the more they believed in change. Similarly, self-rated Optimism and Self-Esteem was correlated with four of the five factors; more optimistic people with higher self-esteem believed more in the possibility of change. Interestingly, education (degree status) and political beliefs were unrelated to any of the five factors. It was clear that more of the correlations with factors 1 and 2 were significant with all other variables, compared to factors 3, 4 and 5.

The concurrent validity correlations with the Dweck measures were particularly interesting. Only one, beliefs in the ability to grow, was consistently significantly correlated with all five factors, showing those who had an ability growth mindset believed more that it was possible to increase all five factors assessed here. The two Growth and Fixed (Ability and Personality) Mindsets were combined and correlated with the five factors. Only the Growth Mindset shows significant correlations with the factors: one ($r$ = 0.21) two ($r$ = 0.22) four ($r$ = 0.09) and five ($r$ = 0.09).

In the final analysis hierarchical regressions were performed onto the five growth belief factors (See Table 5). Six measures were significant in the first regression which indicated that younger, less educated females who were more religious and optimistic and endorsed the growth ability mindset believed more in personality change. Five measures were significant in the second regression which indicated that younger, less educated females who were more religious and endorsed the growth ability mindset believed more in belief and habit change.

There were only two significant correlates for the regression onto the third factor. More religious people with higher self-esteem believed in changes in health. Similarly there was only one significant relationship for the fourth factor which indicated that higher self-esteem people believed in the possibility of change in social status. The final regression showed older, better educated, less religious people believed in the probability of physical change.

## 4. Discussion

The issue concerning the possibility of (positive) change over a lifetime in personal characteristics could be dichotomised as an optimistic vs pessimistic, idealist vs realist or essentialists vs non essentialist difference (Haslam et al., 2004). Our question is why some people favour one approach over another and their correlates; what personal factors predict whether individuals believe in change? Dweck has addressed this but focusing on just two characteristics.

Probably academics are just as divided as lay-people on this issue, possibly because of the difficulty of doing research. To answer the question means getting very high quality, longitudinal data over long periods of time (up to 50 years) where a wide variety of possibly confounding, mediating and moderating factors that influence changes in behaviour at different points in time are also assessed. While some researchers have been able to tap into various existent data banks (in education, medical and military) environments, each has problems associated with it making it difficult to answer some of the fundamental questions of change (Furnham & Cheng, 2015a, 2015b, 2016, 2017).

In this study we looked at people's beliefs about change about a wide range of characteristics including those variables often examined by

**Table 4**
Correlations between the different factors.[a]

| | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1)Sex | 1.5 | 0.50 | | | | | | | | | | | | | | | | | |
| (2)Age | 40.15 | 9.19 | 0.03 | | | | | | | | | | | | | | | | |
| (3)Degree | 1.35 | 0.48 | 0.03 | 0.10* | | | | | | | | | | | | | | | |
| (4)Religious | 3.80 | 3.02 | 0.10* | -0.01 | -0.04 | | | | | | | | | | | | | | |
| (5)Politics | 5.77 | 1.78 | 0.02 | -0.15*** | 0.00 | -0.22*** | | | | | | | | | | | | | |
| (6)Optimist | 6.35 | 2.26 | 0.02 | 0.12** | -0.06 | 0.25*** | -0.04 | | | | | | | | | | | | |
| (7)AbilityFix | 18.65 | 2.38 | 0.06 | -0.05 | -0.09* | 0.01 | 0.09 | 0.23*** | | | | | | | | | | | |
| (8)AbilityGro | 15.32 | 2.75 | 0.01 | 0.05 | 0.13** | -0.28*** | 0.06 | -0.28*** | -0.35*** | | | | | | | | | | |
| (9)PersGro | 7.37 | 1.63 | 0.08 | -0.05 | -0.07 | 0.15*** | 0.03 | 0.23*** | 0.50*** | -0.34*** | | | | | | | | | |
| (10)PersFix | 6.34 | 1.48 | -0.05 | 0.02 | 0.08 | -0.19*** | 0.07 | -0.32*** | -0.28*** | 0.49*** | -0.36*** | | | | | | | | |
| (11)Self | 263.98 | 56.59 | -0.03 | -0.06 | -0.14** | 0.27*** | -0.04 | 0.45*** | 0.15*** | -0.27*** | 0.14** | -0.25*** | | | | | | | |
| (12)Fac1 | 58.49 | 15.00 | 0.15*** | -0.09* | 0.06 | 0.26*** | -0.05 | 0.26*** | -0.08 | 0.30*** | -0.16*** | 0.22*** | 0.20*** | | | | | | |
| (13)Fac2 | 42.90 | 13.41 | 0.13*** | -0.13*** | 0.08 | 0.30*** | 0.04 | 0.18*** | -0.09* | 0.28*** | -0.11* | 0.18*** | 0.19*** | 0.63*** | | | | | |
| (14)Fac3 | 19.99 | 6.14 | -0.01 | 0.03 | 0.05 | 0.15*** | 0.01 | 0.07 | -0.02 | 0.09* | -0.03 | 0.02 | 0.15*** | 0.20*** | 0.21*** | | | | |
| (15)Fac4 | 19.36 | 4.85 | 0.06 | -0.06 | -0.02 | 0.13** | -0.01 | 0.12** | -0.03 | 0.13** | -0.08 | 0.08 | 0.18*** | 0.45*** | 0.56*** | 0.24*** | | | |
| (16)Fac5 | 16.52 | 5.72 | 0.09* | 0.09* | 0.12* | 0.20*** | 0.01 | 0.10* | -0.04 | 0.12** | -0.05 | 0.03 | 0.09 | 0.31*** | 0.40*** | 0.44*** | 0.30*** | | |
| (17)UF1Behav | 7.89 | 1.70 | -0.21*** | 0.28*** | 0.08 | -0.10* | -0.02 | -0.10* | -0.16*** | 0.22*** | -0.23*** | 0.20*** | -0.08 | -0.30*** | -0.30*** | -0.08 | -0.18*** | -0.12** | |
| (18)UF2Behav | 2.55 | 0.73 | -0.12** | -0.02 | -0.01 | -0.05 | -0.04 | 0.02 | -0.04 | 0.10* | -0.06 | 0.13** | 0.13** | -0.08 | -0.17*** | -0.06 | -0.03 | -0.14** | 0.30*** |

[a] *** = $p < .001$, ** = $p < .01$, * = $p < .05$

**Table 5**
Regression onto the five change factors.

| | 1.Personality traits | | | | 2. Social Beliefs | | | | 3. Physical factors | | | | 4. Occupational factors | | | | 5.Body Shape | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | B | SE | Beta | t | B | SE | Beta | t | B | SE | Beta | t | B | SE | Beta | t | B | SE | Beta | t |
| Sex | 4.03 | 1.23 | 0.14 | 3.30** | 2.97 | 1.10 | 0.11 | 2.71** | -0.30 | 0.54 | -0.02 | -0.55 | 0.52 | 0.43 | 0.05 | 1.22 | 0.77 | 0.50 | 0.07 | 1.55 |
| Age | -0.19 | 0.07 | -0.12 | -2.76** | -0.18 | 0.06 | -0.12 | -2.95** | 0.03 | 0.03 | 0.04 | 0.97 | -0.03 | 0.02 | -0.06 | -1.22 | 0.06 | 0.03 | 0.09 | 1.99* |
| Degree | 3.45 | 1.29 | 0.11 | 2.68** | 3.74 | 1.15 | 0.13 | 3.24** | 0.86 | 0.57 | 0.07 | 1.51 | 0.16 | 0.45 | 0.02 | 0.35 | 1.51 | 0.52 | 0.13 | 2.90** |
| Religious | 0.59 | 0.22 | 0.12 | 2.64** | 0.98 | 0.20 | 0.22 | 4.90*** | 0.27 | 0.10 | 0.13 | 2.74** | 0.09 | 0.08 | 0.06 | 1.21 | 0.35 | 0.09 | 0.19 | 3.87*** |
| Politics | -0.17 | 0.36 | -0.02 | -0.48 | 0.64 | 0.32 | 0.09 | 2.01* | 0.18 | 0.16 | 0.05 | 1.17 | 0.02 | 0.12 | 0.01 | 0.17 | 0.21 | 0.14 | 0.07 | 1.48 |
| Optimist | 1.08 | 0.32 | 0.16 | 3.36*** | 0.39 | 0.29 | 0.07 | 1.37 | -0.07 | 0.14 | -0.02 | -0.47 | 0.09 | 0.11 | 0.04 | 0.76 | 0.06 | 0.13 | 0.03 | 0.49 |
| Self-esteem | 0.01 | 0.01 | 0.05 | 1.04 | 0.02 | 0.01 | 0.07 | 1.46 | 0.02 | 0.01 | 0.14 | 2.78** | 0.01 | 0.00 | 0.13 | 2.63** | 0.00 | 0.01 | 0.04 | 0.85 |
| AbilityFixed | 0.50 | 0.31 | 0.08 | 1.63 | 0.03 | 0.28 | 0.01 | 0.10 | 0.01 | 0.14 | -0.01 | 0.09 | 0.09 | 0.11 | 0.04 | 0.79 | -0.03 | 0.13 | -0.01 | -0.24 |
| AbilityGrowth | 1.18 | 0.27 | 0.22 | 4.30*** | 0.97 | 0.25 | 0.20 | 3.98*** | 0.15 | 0.12 | -0.07 | 1.25 | 0.14 | 0.10 | 0.08 | 1.49 | -21 | 0.11 | 0.10 | 1.88 |
| PersGrowth | -0.47 | 0.45 | -0.05 | -1.04 | 0.25 | 0.40 | 0.03 | 0.61 | 0.01 | 0.20 | -0.00 | 0.02 | -0.10 | 0.16 | -0.03 | -0.64 | 0.03 | 0.18 | 0.01 | 0.14 |
| PersFixed | 0.26 | 0.49 | -0.03 | 0.53 | 0.17 | 0.44 | 0.02 | -0.39 | 0.24 | 0.22 | 0.06 | -1.09 | -0.06 | 0.17 | -0.02 | -0.32 | -24 | 0.20 | -0.06 | -1.21 |
| Adjusted $R^2$ | 0.174 | | | | 0.171 | | | | 0.030 | | | | 0.032 | | | | 0.062 | | | |
| F | 10.719 | | | | 10.566 | | | | 2.432 | | | | 2.547 | | | | 4.081 | | | |
| p | 0.000 | | | | 0.000 | | | | 0.006 | | | | 0.004 | | | | 0.000 | | | |

Higher Scores indicate more change. Sex:1 = Male; 2 = Female; Degree 1 = yes; 2 = No.

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

differential psychologists, namely personality and intelligence. It appears that overall they believe Neuroticism and Conscientiousness were more likely to change compared to Openness and Extraversion. They also believed both EQ and IQ were equally likely to change, while there is extensive evidence of the stability of IQ and the many and extensive failure of efforts to improve it (Deary et al., 2000). The four features they thought least likely to change were height, religious beliefs, punctuality and trait Openness while those most likely to change were physical health, wealth, EQ and looks. It was also interesting to note that respondents thought it essentially as easy to change sexual preferences as it was BMI. Again, the academic literature would suggest the opposite (Seligman, 2007). One question is where people get their ideas about change, and indeed how easy it is the change their beliefs about change. Further there is the question of how much change (fundamental vs trivial) and whether the change is long lasting. Thus diets can lead to change in BMI but often there is a clear return to the original BMI.

As may be expected, people who were more likely to believe that they had changed were more likely to believe change possible. This makes it all the more desirable to have observer data on change. Indeed, when people meet at reunions (school, university, military) after long periods they appear to be surprised how little people had changed in their personality, beliefs and behaviour compared to their physical appearance. This suggests a classic attribution error.

The factor analysis of 27 characteristics made sense and reasonably confirmed the a-priori classification of the items. The positive correlations between the five factors ($0.20 < r < 0.63$) with half being greater than $r > 0.40$ suggests a Mindset type factor: Chango-philes and Chango-phobes.

Correlations with the two Dweck Mindset factors showed an interesting difference. It was the ability growth mindset that seemed most related to the change factors, which makes sense. Some would see this as a naïve optimism that ability, and many more human characteristics are susceptible to change, rather than the concept growth which is not as clear.

Age was not strongly related to beliefs about change but two of the five correlations were significant in the expected direction proving some support for H1. No doubt religious people endorse the concept of change more than non-religious people as most religions focus on personal change and consequent redemption. This confirmed H2. Equally it was interesting to observe that political beliefs were unrelated to beliefs about change which did not confirm H3. There was strong evidence for H4 and H5 that optimistic people with high self-esteem believed most in the opportunity for change.

Lay beliefs about change is certainly relevant to all those attempting to help people change their behaviour like clinicians, coaches and counsellors. Presumably people would not seek out help if they did not believe they could undergo some sort of beneficial change though understanding their beliefs about how the process works and their part in it, as well as how much they can change are important. Thus being naively optimistic may be as much as predictor of failure as cynical skepticism about change. Indeed it is not clear whether many "self-help" change books and programmes promise much more than they can possibly deliver.

Like all studies this had limitations. It would have been desirable to know more about the participants, particularly their personal attempts at changing any aspect of their lifestyle or themselves. Similarly it would have been desirable to have actual measures of their IQ, health and personality to determine whether these are related to change beliefs.

## Ethics approval

UCL Psychology Dept number CEHP/514.2013 granted permission for this study to be done,

## Registration

This paper was not pre-registered with the journal.

## Ethics

This was sought and obtained (CEHP/514/2017).

## Informed consent

Participants gave consent for their anonymised data to be analysed and published.

## CRediT authorship contribution statement

A.Furnham: Visualisation, Data collection and analysis, Drafting. R Sherman: Visualisation, Drafting.

## Declaration of competing interest

There is no conflict of interest in this research or paper.

## Data availability

This is obtainable from the first author upon request.

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