

# Application of a 10 week coaching program designed to facilitate volitional personality change: Overall effects on personality and the impact of targeting

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## Abstract

The current study explored the outcomes of a 10 week coaching program designed to facilitate volitional personality change. It also explored the impact of targeting specific personality facets on change. This research builds upon the burgeoning literature challenging the view that personality is fixed. The results of the study indicated that the 10 week program resulted in significant increases in participant's conscientiousness and extraversion and significant decreases in neuroticism. These changes were maintained 3 months post-intervention for neuroticism and extraversion. Targeting of associated facets significantly interacted with time during the intervention period for emotionality and conscientiousness, but not for extraversion.

**Key Words:** Personality, Personality Change, Coaching, Neuroticism, Conscientious

## Introduction

There is an increasing body of literature to suggest that personality may be amenable to change via interventions (e.g., Piedmont, & Ciarrochi, 1999; Tang et al., 2009; Nelis et al., 2011). Furthermore, the consequential outcomes literature is extensive and suggests that personality is predictive of a number of important life outcomes (Ozer & Benet-Martinez, 2006). Researchers have found that certain personality domains tend to be associated with positive outcomes, while others are associated with negative outcomes (Ozer & Benet-Martinez, 2006). Taken together the literature above suggests that personality characteristics may be changeable, and that if characteristics associated with positive outcomes are increased and those associated with negative outcomes are decreased, this may have a positive impact on an individual's life. However, while there has been extensive research on personality change, there has been limited research on whether personality can be successfully targeted for change via intervention. The majority of personality change research has looked at personality change over the lifespan (e.g., Roberts, Walton & Viechtbauer, 2006) or explored incidental personality change in interventions targeting other constructs (e.g., Tang et al., 2008). Consequently, the current paper will explore the effect of a 10 week personality change coaching program on overall personality domains and how targeting specific aspects of personality affects outcomes.

Before beginning a discussion on changing personality, it is necessary to define what is meant by personality and what is meant by personality change. Personality consists of "relatively enduring patterns of thoughts, feelings, and behaviours that reflect the tendency to respond in certain ways under certain circumstances" (Roberts, 2009, p. 140). Consequently there are a number of requirements that must be met for personality to be considered to have changed. The first is that there are changes in thoughts and/or feelings and/or behaviours in response to certain situations. The second is that there is sufficient temporal and situational breadth for these changes to be



considered an “enduring pattern”. That is changes must occur in multiple situations where individual differences would be expected to occur and these changes must become enduring over time (Roberts, 2009; Allemand & Fluckiger, 2017).

The dominant framework for describing personality is the five factor model (McCrae, 2009). The five-factor model posits that a person’s personality is best described along five major dimensions, i.e., neuroticism (or emotionality), conscientiousness, extraversion, openness and agreeableness (Costa & McCrae, 1992). People high in conscientiousness tend to be self-disciplined, organized and deliberate. Agreeable individuals are more sympathetic and co-operative towards others. Neuroticism is reflected in a tendency to experience higher levels of negative emotions such as stress, anxiety, sadness and anger. Individuals higher in openness will tend to be more open to new ideas and behaviours as well as demonstrating a preference for novelty and culture. Extraverted people are generally more sociable, energetic and assertive (Costa & McCrae, 1992).

The current study explored data gathered via the NEO PI-R (Costa & McCrae, 1992). The NEO PI-R is a widely used and well researched measure of the five factor model of personality. It measures the five domains of personality as well as six more specific traits (facets) within each domain. For example the domain of conscientiousness is further split into the six facets of competence, order, dutifulness, achievement striving, self-discipline and deliberation.

## Arguments for and against personality change

Costa and McCrae (1994) posited that after the age of thirty there is little evidence that personality can be changed. They support this stance based on their longitudinal studies which found little meaningful change in personality past young adulthood (Costa, Herbst, McCrae, & Siegler, 2000). This view is further supported by the strong rank order consistency of personality across the lifespan (Fraley & Roberts, 2005; Roberts & DelVecchio, 2000). Roberts, Walton and Viechtbauer (2006) challenged this assertion by pointing out a number of problems with using the above findings to conclude that personality does not change after young adulthood. Firstly, Roberts et al. (2006) argued that an absence of mean level change does not preclude large individual changes within the sample (e.g.  $M$  of 2, 2, 2 =  $M$  of 0, 2, 4). Secondly, consistency in rank order also does not preclude significant change provided the relative rankings do not change (e.g. 1, 2, 3 could change to 2, 4, 6 and the rank order would remain the same). Furthermore Roberts et al. (2006) meta-analysis contradicted Costa and McCrae’s (1994) assertion, finding significant mean level changes in several personality traits after the age of 30. Specifically Roberts et al. (2006) found significant mean level increases in conscientiousness, social dominance and emotional stability (positive pole of neuroticism).

A second set of research findings that has been used to argue against the possibility of personality change is the heritability literature (McCrae et al., 2000). This literature suggests that a substantial portion of an individual’s personality is determined via genetic factors. A meta-analysis conducted by Vukasovic and Bratko (2015) found an average effect size of .4 across 134 studies. This suggests that 40% of the variance in individual’s personalities can be attributed to genetic factors. However while these findings do suggest a substantial role for genetics in explaining individual differences in personality, they also suggest that environment plays an even greater role (60%). Consequently rather than disputing the possibility of personality change, we would argue that the heritability literature provides evidence that there is a substantial role for environment in personality.

## Evidence for personality change via interventions

The literature reviewed above described studies which had looked at personality change/stability over the lifespan. However a limitation of this research, in terms of its relevance to the current study, is that it is focussed on change over long periods of time in individuals who had not undergone a discrete intervention. Furthermore it is possible that the environmental influences



found in the heritability literature are made up of early childhood experiences and thus do not necessarily provide evidence for personality change interventions in adults. Consequently of more relevance to the current research is the literature which has explored incidental changes in personality, in adult populations, in response to interventions.

A number of studies have found incidental changes in personality during the treatment of clinical disorders. A study conducted by Tang et al. (2009) found that participants treated with selective serotonin re-uptake inhibitors (SSRIs) self-reported significant changes in neuroticism and extraversion, while those treated with cognitive therapy showed significant changes in extraversion. De Fruyt, Van Leeuwen, Bagby, Rolland, and Rouillon (2006) also found that six months of therapeutic and pharmacological interventions produced small but significant differences in extraversion, openness, conscientiousness and agreeableness. They also found that participants self-reported as substantially more emotionally stable (positive pole of neuroticism). Similarly, Piedmont (1999) indicated that a six week outpatient program for individuals with substance abuse problems produced significant changes across all five dimensions of personality. Furthermore, for three of these traits (conscientiousness, agreeableness and emotional stability) personality changes remained significant 15 months after treatment had ceased. Consequently there is evidence to suggest that personality may be changed through clinical interventions.

There have also been a small number of studies which have demonstrated incidental changes in personality as the result of interventions in non-clinical populations. Krasner et al. (2009) found that an intensive mindfulness education course produced significant increases in conscientiousness and emotional stability. Nelis et al. (2011) examined the effect of 18 hours of emotional competence training, and subsequent email follow ups, on several variables including personality. Their results suggested that the training resulted in a significant reduction in neuroticism and significant increases in agreeableness and extraversion. A 6 month follow up revealed a small decline towards pre-intervention levels. However, neuroticism remained significantly lower, and agreeableness and extraversion remained significantly higher, when compared to pre-intervention scores. Similarly Jackson, Hill, Payne, Roberts and Stine-Morrow (2012) indicated that older adults, when given inductive reasoning training, demonstrated significant increases in openness over a 30 week period. Finally, Spence and Grant (2005) found that 10 life coaching sessions significantly increased the personality factors of extraversion and openness over a 10 week period.

Excluding the current line of research, a literature review found a total of two studies (described in one paper) that found empirically significant evidence for intentional personality change. The first study by Hudson and Frayley (2015) found that people's personality change goals predicted changes in personality in the desired direction (i.e., the direction of their goal). The second study found that training participants in how to create specific structured personality change goals (and then having them set specific intentions each week) resulted in significant changes in personality in the desired direction. It should be noted however that these changes were quite small (an average .02 standard deviations per month). Interestingly those participants who set unstructured goals did not change their personalities in the desired direction. Taken together, the research reviewed above provides evidence that intentional personality change is possible and suggests that structured goal setting may be an important technique in producing change.

The literature reviewed above indicates that personality may be amenable to change as the result of interventions. However, this finding, in itself, is not enough to warrant the development of specific personality change interventions. It is also important for the potential benefits of personality change to be made clear.

## Why is personality change important?

Personality has been found to influence almost every aspect of a person's life. In their review, Ozer and Benet-Martinez (2006) indicated that personality was predictive of a range of life outcomes



such as physical and mental health, work performance and relationship quality. Two domains that appear to be particularly related to life outcomes are conscientiousness and neuroticism.

Neuroticism has been found to be a predictor of a number of negative life outcomes. In their meta-analysis, Steel, Schmidt and Shultz (2008) found that neuroticism negatively predicted happiness, subjective well-being, life satisfaction, quality of life and overall affect. Neuroticism has also been associated with poor career/work outcomes, negatively predicting job satisfaction and performance (Thoresen, Kaplan, Barsky, Warren, & de Chermont, 2003; Hurtz & Donovan, 2000). Neuroticism appears to be particularly destructive in relationships, negatively predicting marriage satisfaction and relationship quality and positively predicting abuse and conflict (Robins, Caspi & Moffitt, 2002; Karney & Bradbury, 1995). The literature relating neuroticism to physical health outcomes is mixed, however overall it suggests a negative relationship between neuroticism and physical health (Chapman, Roberts & Duberstein, 2011). Furthermore, there is evidence to suggest that negative mental health outcomes are predicted by neuroticism (Malouff, Thorsteinsson, & Schutte, 2005). Thus, considering the potentially damaging effect that neuroticism has on individuals lives, interventions designed to reduce neuroticism may be beneficial.

There may also be an economic rationale for attempting to reduce neuroticism. Cuijpers et al. (2010), using data gathered from 5,504 people through a Netherlands mental health survey, found that the health care cost per million people for individuals in the top 25% of neuroticism was 1.39 billion. This figure is 2.5 times the cost incurred due to mental health disorders. Cuijpers et al. (2010) also suggested that actual costs may be much higher as individuals higher in neuroticism also tend to experience lower levels of employment. They proposed that future research should focus on developing interventions to reduce neuroticism as the consequential outcome literature is well established.

In contrast to neuroticism, conscientiousness has been found to be predictive of a number of positive life outcomes. Conscientiousness appears to be the strongest of the personality domains in predicting work related outcomes (Hurtz & Donovan, 2000; Barrick & Mount, 1991; Judge, Higgins, Thoresen & Barrick, 1999; Thoresen et al., 2003). It has also been positively associated with well-being and relationship satisfaction (Steel, Schmidt & Schultz, 2008; Malouff, Thorsteinsson, Schutte, Bhullar & Rooke, 2010).

Perhaps one of the most important aspects of conscientiousness is its association with physical and mental health. Conscientiousness has been found to be predictive of both health and longevity (Hampson, Goldberg, Vogt & Dubanoski, 2007; Kern & Friedman, 2008; Chapman et al., 2011). It has also been found to negatively predict the symptoms of clinical mental disorders (Malouff et al., 2005). Conscientiousness is also related to many factors which are predictive of health. For example, conscientiousness negatively predicts substance abuse and positively predicts educational attainment and health behaviors (Bogg & Roberts, 2004; Hampson et al., 2007). Consequently, it has been suggested that conscientiousness may be causally related to improved health via increasing health promoting behaviors and decreasing health damaging behaviors (Kern, Hampson, Goldberg & Friedman, 2014). The importance of conscientiousness from a public health perspective has been generating increasing interest. A recent special issue of *Developmental Psychology* (issue 50, volume 5) was dedicated entirely to this topic. A key theme running throughout this issue was the need for, and importance of, developing theory driven interventions to successfully increase conscientiousness (Reiss, Eccles, & Nielsen, 2014).

## Coaching versus therapy and other ethical considerations

The broadness of personality brings up questions of whether an intervention targeting personality should be considered therapy or coaching. One aspect which makes this distinction difficult is that the boundaries between therapy and coaching can be considered “fuzzy” and that in many areas therapy and coaching overlap (Jopling, 2007; Spinelli, 2010; Hart, Blatner & Leipsic, 2007).



Furthermore, certain personality traits will have closer theoretical ties to coaching while others will have closer ties to therapy (e.g. the conscientiousness facet “self-discipline” versus the neuroticism facet “anxiety”). Consequently it may depend on what personality facets are being targeted that determines whether a personality change intervention looks more like therapy or coaching. However there is one area of difference between coaching and therapy which the authors felt was important enough to definitively call the current study a coaching intervention. That is that coaching tends to focus relatively more on strengths whereas therapy tends to focus relatively more on deficits or pathology (Hart et al., 2007). While many therapeutic approaches have attempted to move away from the perspective that therapy is for addressing deficits or pathology (e.g. solution focused therapy, acceptance and commitment therapy) there is never the less a general assumption in society that you see a therapist to fix a problem or to address a mental health disorder (Vogel, Wester & Larson, 2007). This problem/pathology focus becomes particularly concerning when applied to the construct of personality. Approaching participants (who in the current study were from the general population) from the perspective that they have a problem/pathology within their personality has the potential to be damaging to that persons self-image (particularly if no change occurs). In contrast, focusing on using the participant’s strengths to make positive changes in their personality appears to carry a lower risk of potential harm. Consequently the decision to label the current study a coaching intervention was based more so on the perceived benefit of a coaching frame over a therapeutic frame as opposed to being based on whether the specific techniques utilized were more related to coaching or therapy.

Another area of concern regarding potential harm to participants relates to the level of volitionality. That is, to what extent participants desire to change their personality stems from intrinsic versus extrinsic sources. The idea that someone may choose to change themselves does not appear ethically problematic provided that decision comes from intrinsic sources. However the possibility that a person may choose to change their personality because of extrinsic pressure exerted upon them by a partner, organisation or professional is very concerning. Thus it is important that any personality change interventions are executed in a way that maximises volitionality. This suggests that personality change interventions may be inappropriate in an organisational context (even with an opt in methodology as there still may be pressure to take part). Furthermore recruitment methods should involve minimal social pressure (e.g. mediums where the person can choose to opt out without saying “no” to someone). Examples of this would be flyers and newspaper advertisements. Finally once the person is engaged in the program it is important that the changes they choose to make are based on their own reflection on their personality and where it is causing problems in their lives as opposed to being pressured to make certain decisions based on the consequential outcome literature.

## The current study

In response to the evidence that personality change appeared both possible and beneficial, Martin, Oades and Caputi (2014a) developed a step-wise process of intentional personality change. A detailed description of the development of this intervention can be found in Martin et al. (2014a). This intervention incorporated elements of intentional change theory, and utilized motivational interviewing, and eclectic therapeutic and coaching techniques, within a goal setting framework (Boyatzis, 2006). Martin, Oades and Caputi (2014b) found that application of the step-wise process of personality change over a 10 week coaching period resulted in significant change in targeted personality facets. Furthermore, these changes remained significant at the three month follow up. Allan, Leeson and Martin (2014) found that the most common facets targeted for change fell within the domains of neuroticism and conscientiousness.

Martin et al. (2014b) allowed participants to choose specifically what facets they wished to target for change. This makes sense from a coaching perspective as it allows participants to tailor their goals to their own individual needs. It is also important from an ethical standpoint that participants are in complete control of what aspects of their personality they choose to target for change. This



design meant that participants tended to target different facets for change. Furthermore some participants targeted as few as one facet while others targeted up to eight facets. Consequently to allow for comparison between participants the construct of “average targeted facet score” was created. This score was an average of the change that had occurred in the facets that had been targeted by a participant.

The construct of average targeted facet score allowed Martin et al. (2014b) to determine whether on average scores on targeted facets changed. However there is no specific information regarding which personality facets or domains changed as a result of the intervention. While Allan et al. (2014) did provide information on which facets were most commonly targeted this still does not provide specific information on which aspects of personality were changed as a result of the intervention. For example an average change of five points for someone who targeted anxiety and self-discipline could be the result of a five point change in both facets or a 10 point change in one facet and a zero point change in the other. Information on specifically what aspects of personality were changed is important because it could provide tentative evidence to justify the development of more specific and standardized interventions to explore the possible efficacy of targeting a specific domain or facet for change.

Another limitation of Martin et al. (2014b) is that it did not provide evidence for whether changes in targeted facets stemmed from targeting that facet or arose from general intervention effects. For example, a decrease in a targeted facet such as anxiety may be the result of targeting this facet or it could be that the overall effect of the intervention (regardless of whether anxiety is targeted or not) tends to reduce anxiety. This is important as it provides some information regarding how important the specific targeting of facets is to the change process.

It should be noted that a study exploring the impact of a targeting specific facets or domains for change would ideally control these variables during the experiment. However, as mentioned above, allowing the participants to control what they targeted was important from both an ethical and motivational standpoint. Furthermore Martin et al. (2014b) study sought primarily to help answer the general question of could participants intentionally change their personality? This is a question that needs to be answered first before more specific questions such as can individuals change “x” facet or “y” domain are answered. However, despite these limitations, the authors of the current study argue that information regarding overall change at both the domain and facet level, as well as the impact of targeting of specific facets on change in those facets, would present a useful contribution to the personality change and coaching literature.

Consequently the current study hypothesized that the domains which had the highest number of facets targeted by participants (neuroticism and conscientiousness) would significantly change as a result of the intervention. Furthermore it was hypothesized that the targeting of facets would have a significant effect on the results of the intervention.

## Method

### Participants and procedure

After completing informed consent forms, participants were randomly allocated to either the waitlist group or the coaching group. Those participants in the coaching group were then allocated a coach. This was followed by 10 weekly meetings with their coach in which they engaged in the step-wise process of intentional personality change (described below). Participants in the coaching group completed the NEO PI-R pre-intervention, at week five of the coaching program and post intervention. A follow up NEO PI-R was also conducted at three months post intervention (week 22).



Those participants in the waitlist group completed their time one NEO PI-R, and then after a 10 week waiting period completed an additional NEO PI-R. Following this, they underwent the 10 week coaching program delivered to the coaching group described above (they also underwent an identical testing regiment to the coaching group).

## Data collection

The current study used archival data collected during Martin, Oades and Caputi's (2014b) randomized wait list controlled trial of intentional personality change coaching.

## Participants

The participants were 54 adults (8 males and 46 females) with ages ranging from 18 to 64 ( $M = 42.18$ ,  $SD = 12.44$ ). Participants were matched for gender and age and then randomly allocated randomly to the waitlist ( $n = 27$ ) or coaching ( $n = 27$ ) group. Six participants from the waitlist group withdrew, and were replaced by individuals who matched their age and gender. After completing the waitlist period the waitlist group also underwent the coaching program. Three participants who completed the waitlist period chose not to engage in the coaching program. One participant from those who completed the coaching program did not complete the three month follow up.

Participants were recruited via an article in a local paper, word of mouth and an online post on a university's website. Participants were required to be older than 18. Participants with AXIS II disorders, psychosis, bipolar disorder or who had a current substance use disorder were excluded from the study.

## Coaches

Coaching was provided by registered and trainee psychologists. The trainee psychologists had a minimum of five years education in psychology and a minimum of 60 face to face client contact hours. They also underwent weekly one hour supervision sessions, where videoed coaching sessions were reviewed. The psychologists were required to undergo a one day training workshop and were provided with a training manual.

## Measures

The NEO PI-R (Costa & McCrae, 1992) consists of 240 items on a five point Likert scale (0 = strongly disagree, 4 = strongly agree). An example item is "I often crave excitement". The NEO PI-R is designed to measure the five domains of personality, with 6 facets under each domain providing more specific information. The NEO PI-R has high levels of internal consistency (ranging from .86 to .95) and is well validated in the literature (Costa & McCrae, 1992; Piedmont, 1998).

## Coaching program

The step-wise process of intentional personality change utilized 10 steps in facilitating personality change. The first step involved assessing client's current personality and helping them discover their values. The second step focused on discovering the current self and exploring personality functioning. Clients reflected on the positive and negative aspects of their lives and how their current personality may be affecting these aspects. They also reflected on the extent to which they were living in alignment with their values. Step three involved identifying the ideal self (a vision of who they want to be) and exploring discrepancies between the ideal and current self (Boyatzis, 2006). This involved exploring their current personality profile and how this might differ from their ideal personality profile. This allowed clients to determine a shortlist of personality facets for targeting. Step four involved selecting from this shortlist a realistic number of facets to target for change. The fifth step involved assessing the client's attitude towards change. Specifically the importance of change, confidence in ability to change, timeliness of change as well as intrinsic and extrinsic motivation were assessed.



The sixth step focused on the development and implementation of a coaching plan. The coach and the client collaborated to determine, from a menu of eclectic therapeutic techniques provided for each facet, which interventions they would use to achieve desired facet change. For example one participant may have wished to increase the conscientiousness facet self-discipline and thus they would have a choice of related techniques (e.g. goal setting, organizational skills, life style skills, positive self-talk). A second participant may have chosen to change anxiety and thus would have some techniques that overlapped with the first participant (e.g. goal setting, positive self-talk, life style skills) but also some different techniques (e.g. cognitive therapy techniques, exposure based techniques). Step seven occurred during week five of the program and involved re-assessing client's personality, evaluating progress and using this information to inform the final five weeks of coaching. Step eight involved completing the remaining coaching sessions which consisted of applying the facet and participant specific interventions chosen via the process described in step six. Step nine occurred at the final coaching session and included re-assessing personality to review the client's progress towards desired change, and developing a plan to maintain gains. Finally, in order to determine whether gains had been maintained, step 10 was a three month follow up personality assessment.

## Results

To determine whether changes occurred at the domain level, across the intervention period, five one way repeated measures ANOVAS were conducted. Following this, change at the facet level was also assessed. In order to limit the number of analyses, only facets that fell within domains that had significantly changed over the intervention period were analyzed. Finally, a mixed design ANOVA was performed to determine whether targeting of facets significantly influenced change.

### Domain level change

A one way repeated measures ANOVA with a Greenhouse-Geisser correction determined that mean neuroticism was significantly different between time points,  $F(2.04, 99.99) = 30.07, p < .001, \eta^2 = .38$ . Post Hoc tests using the Bonferroni correction indicated that there was a significant decrease in neuroticism between weeks one ( $M = 88.14, SD = 29.52$ ) and five ( $M = 79.70, SD = 27.06$ ),  $p < .001$ . There was also a significant decrease in neuroticism between weeks five to ten ( $M = 71.04, SD = 25.06$ ),  $p < .001$ . This significant difference was maintained at week 22 ( $M = 71.06, SD = 24.68$ ),  $p < .001$ .

A one way repeated measures ANOVA with a Greenhouse-Geisser correction determined that mean conscientiousness was significantly different between time points,  $F(1.86, 91.00) = 4.69, p < .01, \eta^2 = .09$ . Post Hoc tests using a Bonferroni correction indicated that there was not a significant increase in conscientiousness between weeks 1 ( $M = 122.33, SD = 20.43$ ) and week five ( $M = 124.86, SD = 19.75$ ) or between week 5 and week ten ( $M = 128.90, SD = 19.76$ ). However there was a significant difference between week 1 and ten,  $p = .03$ . This significant difference was not maintained at week 22 ( $M = 127.54, SD = 19.02$ ).

A one way repeated measures ANOVA with a Greenhouse-Geisser correction determined that mean extraversion was significantly different between time points,  $F(2.26, 110.74) = 6.77, p < .001, \eta^2 = .12$ . Post Hoc tests using the Bonferroni correction indicated that there was not a significant increase in extraversion between weeks 1 ( $M = 110.54, SD = 23.48$ ) and 5 ( $M = 112.54, SD = 23.85$ ). There was a significant increase in extraversion between weeks 5 and ten ( $M = 116.48, SD = 23.34$ ),  $p = .03$ . There was also a significant increase between weeks 1 and ten,  $p < .01$ . This significant difference was maintained at week twenty two ( $M = 116.12, SD = 22.88$ ),  $p = .02$ .





A one way repeated measures ANOVA with a Greenhouse-Geisser correction determined that mean agreeableness was not significantly different between time points,  $F(2.54, 124.63) = 1.7, p = .86$ . Similarly there was no significant difference between time points for mean openness,  $F(2.41, 118.08) = 2.20, p = .05$ .

## Facet level change

A one way repeated measures ANOVA was performed for each of the facets of neuroticism. A Greenhouse-Geisser correction was used for anxiety, vulnerability, depression, impulsiveness and self-consciousness as Mauchly's test indicated that sphericity had been violated for these variables. The results of the analysis indicated that there was significant variation across time points for all facets. A summary of these results is provided in Table 1 below.

**Table 1: Summary of repeated measures ANOVA for neuroticism facets across the intervention and post intervention periods.**

Facet	F	p	$\eta p$
Anxiety	19.15 (2.47, 121.07)	>.001	.28
Angry/hostility	10.52 (3, 147)	>.001	.18
Vulnerability	11.93(2.49, 121.93)	>.001	.20
Depression	19.42 (2.17, 105.90)	>.001	.28
Impulsiveness	11.20 (2.46, 120.41)	>.001	.19
Self-consciousness	14.56 (2.25, 110.40)	>.001	.23

Post hoc testing using the Bonferroni adjustment indicated that there was a significant decrease in all neuroticism facets between week 1 and week ten (all  $p < .001$ ). This difference was maintained at week twenty two for all neuroticism facets (all  $p < .001$ ). There was a significant decrease between week 1 and week 5 for anger ( $p = .02$ ), vulnerability ( $p = .05$ ), depression ( $p < .01$ ), impulsiveness ( $p < .01$ ) and self-consciousness ( $p < .03$ ) but not for anxiety ( $p = .13$ ). There was a significant difference between week 5 and week ten for anxiety ( $p < .001$ ), vulnerability ( $p < .01$ ), depression ( $p < .001$ ) and self-consciousness ( $p < .01$ ) but not for angry/hostility ( $p = .20$ ) or impulsiveness ( $p = .20$ ). A summary of the means for each facet of neuroticism at each time point is presented in table 2 below.

**Table 2: A summary of the means for neuroticism at each time point during the intervention and post intervention periods.**

Facet	Week 1		Week 5		Week 10		Week 22	
	M	SD	M	SD	M	SD	M	SD
Anxiety	16.90	7.11	15.74	6.38	13.76	5.89	13.26	6.13
Angry/hostility	13.28	5.24	12.20	5.35	11.30	5.18	11.22	4.85
Vulnerability	11.98	5.56	11.00	5.34	9.60	4.73	9.60	4.69
Depression	14.34	7.19	12.14	6.65	10.02	5.65	10.44	5.81
Impulsiveness	16.68	6.03	14.86	5.44	14.12	5.18	14.22	5.46
Self-consciousness	14.96	5.89	13.76	6.13	12.24	5.15	12.12	5.07

A one way repeated measures ANOVA was performed for each of the facets of extraversion. A Greenhouse-Geisser correction was used for warmth, gregariousness assertiveness and positive emotions as Mauchly's test indicated that sphericity had been violated for these variables. The results of the analysis indicated that there was significant variation across time points for mean



warmth, gregariousness, assertiveness and positive emotions. A summary of these results is provided in table 3 below.

**Table 3: Summary of repeated measures ANOVA for extraversion facets across the intervention and post intervention periods.**

Facet	F	p	$\eta^2$
Warmth	4.37(2.43, 119.29)	>.01	.08
Gregariousness	3.61 (2.54, 124.65)	>.01	.07
Assertiveness	4.51 (2.17, 106.12)	>.01	.08
Activity	.13 (3, 147)	.47	.00
Excitement	1.32 (3, 147)	.13	.02
Positive Emotions	7.22 (2.03, 99.44)	>.001	.13

Post hoc tests using the Bonferroni correction indicated that there was a significant increase in positive emotions ( $p = .03$ ), gregariousness ( $p = .04$ ), warmth ( $p = .02$ ) and assertiveness ( $p = .03$ ) between weeks 1 and ten. This significant difference was maintained at week twenty two for positive emotions ( $p = .01$ ), gregariousness ( $p = .05$ ) and assertiveness ( $p = .04$ ) but not for warmth ( $p = .13$ ). All other results were non-significant. A summary of the means for the facets of extraversion at each time point is provided in table 4 below.

**Table 4: A summary of the means for extraversion at each time point during the intervention and post intervention periods.**

Facet	Week 1		Week 5		Week 10		Week 22	
	M	SD	M	SD	M	SD	M	SD
Warmth	23.32	4.20	23.64	4.63	24.72	3.82	24.40	3.61
Gregariousness	16.96	6.01	17.78	6.19	18.14	6.07	18.18	5.91
Assertiveness	16.32	5.93	17.08	5.78	17.68	5.19	17.76	5.14
Activity	18.50	4.99	18.78	5.16	18.58	5.00	18.58	4.64
Excitement Seeking	14.86	4.87	14.36	5.02	15.20	4.78	14.74	5.02
Positive Emotions	20.58	6.33	20.90	6.32	22.16	6.14	22.46	6.04

A one way repeated measures ANOVA was performed for each of the facets of conscientiousness. A Greenhouse-Geisser correction was used for competence, order, dutifulness, achievement striving and self-discipline as Mauchly's test indicated that sphericity had been violated for these variables. The results of the analysis indicated that there was significant variation across time points for mean competence, dutifulness, achievement striving and self-discipline. A summary of these results is provided in table 5 below.

Post hoc testing using the Bonferroni adjustment indicated that there was a significant increase in competence between week 1 and week 22 ( $p = .03$ ). There was also a significant increase in self-discipline between week 1 and 10 ( $p = .01$ ). However this difference was not maintained at week 22. All other results were non-significant. A summary of the means for each conscientiousness facet at each time point is provided in table 6 below.



**Table 5: Summary of repeated measures ANOVA for conscientiousness facets across the intervention and post intervention periods.**

Facet	F	p	ηp
Competence	3.09 (2.27, 12.02)	.02	.06
Order	.76 (2.38, 116.48)	.25	.02
Dutifulness	2.86 (2.46, 120.28)	.03	.06
Achievement Striving	2.54 (2.24, 109.79)	.04	.05
Self-Discipline	6.41 (1.72, 84.32)	>.01	.12
Deliberation	.67 (3, 147)	.29	.01

**Table 6: A summary of the means for conscientiousness at each time point during the intervention and post intervention periods**

Facet	Week 1		Week 5		Week 10		Week 22	
	M	SD	M	SD	M	SD	M	SD
Competence	21.58	4.92	22.40	3.87	22.88	5.00	23.06	4.54
Order	20.12	4.68	19.76	3.70	20.44	3.70	20.14	3.51
Dutifulness	23.14	4.12	23.42	3.69	24.18	3.52	23.58	3.17
Achievement Striving	19.52	4.99	20.40	5.15	20.74	5.03	20.56	4.85
Self-Discipline	19.68	5.74	20.50	5.42	21.98	4.93	21.38	4.68
Deliberation	18.28	4.73	18.38	4.84	18.68	4.88	18.82	4.68

## The impact of targeting

A mixed design ANOVA was used to determine whether there was a significant change in personality across all facets and whether these changes were related to facets being targeted by the participants. The facets of neuroticism was reverse scored as participants universally chose to decrease neuroticism facets. The results of the analysis indicated that there was a significant main effect for time,  $F(1, 1528) = 60.74, p < .001, \eta p = .04$ . Participants average score on personality facets increased from week one ( $M = 19.87, SD = 5.81$ ) to week ten ( $M = 21.01, SD = 5.39$ ). There was a significant interaction effect between targeting and time indicating that facets that were targeted by participants experienced larger changes than facets that were not targeted,  $F(1, 1528) = 135.109, p < .001, \eta p = .08$ .

## Discussion

The finding that the current intervention resulted in significant decreases in neuroticism adds to the literature which has indicated that neuroticism may be changeable via interventions (e.g. De Fruyt et al., 2006; Piedmont et al., 1999; Nelis et al., 2011; Hudson & Frayley, 2015). This is encouraging as higher neuroticism has been associated with a number of negative outcomes from both an individual and societal standpoint (Hurtz & Donovan, 2000; Steel et al., 2008; Robins et al., 2002; Karney & Bradbury, 1995; Malouff et al., 2005; Cuijpers et al., 2010). Furthermore Allan et al. (2014) indicated that neuroticism was the personality domain that individuals were most likely to choose to change. Consequently the current findings, in combination with the literature, provide evidence that individuals are motivated and able to reduce neuroticism through application of the step-wise process.



The finding that conscientiousness increased as the result of the intervention is encouraging. Conscientiousness facets were the second most commonly targeted traits during the intervention and conscientiousness has been associated with improvements across multiple life domains (Hurtz & Donovan, 2000; Steel et al., 2008; Karney & Bradbury, 1995; Hampson et al., 2007; Kern & Friedman, 2008). Conscientiousness appears to be particularly important for health related outcomes due to its influence on health behaviours (Kern, Hampson, Goldberg & Friedman, 2014). Thus it had been suggested that it may be helpful from a public health perspective to develop interventions to change conscientiousness (Reiss, Eccles, & Nielsen, 2014). However it had not been established that conscientiousness could be changed through a targeted intervention. This research provides a first step in this line of enquiry. Future research may be able to explore whether changes in conscientiousness are reflected in changes in health behaviours and subsequent changes in health status.

The current study also found significant increases in extraversion over the intervention period. These changes were unexpected because extraversion was infrequently targeted by participants. While surprising, the outcome is nevertheless an encouraging one. Extraversion has a number of positive associations. It is positively predictive of well-being, job satisfaction, and relationship satisfaction and negatively predictive of mental health symptoms (Thoresen et al., 2003; Steel et al., 2008; Karney & Bradbury, 1995; Malouff et al., 2005).

One area where the current study extends upon the work of Hudson and Faryley (2015) is its effect sizes. Hudson and Frayley (2015) indicated that the personality changes found in their studies were relatively small (about .02 of a standard deviation per month). In contrast several of the effect sizes for change in the current study were large (Cohen, 1988). One key difference between the two studies is the relative difference in the intensiveness of the intervention (weekly one to one coaching versus structured goal setting training). This presents an interesting area for future research. That is what attributes of the intervention contribute to the size of personality change.

The changes achieved during the current intervention appear to be positive. That is the changes are occurring in the direction whereby the consequential outcome research indicates positive outcomes increase and negative outcomes decrease. However due to the associative nature of this research the current study is not able to determine whether there were any changes in life outcomes (for an extensive and critical discussion see Friedman and Kern, 2014). It may be useful for future studies conducted in this area to measure associated outcomes, in order to determine whether these changes in personality are related to positive changes in life outcomes. This would aid in determining the beneficence of the current intervention as well as providing criterion validity for the changes in personality domains that were found.

The current study also found that the targeting of specific facets was an important component in creating personality change. This suggests that producing change in personality is similar to producing change in other areas in that more specific goals tend to result in better outcomes (e.g. Locke et al., 1981; Locke & Latham, 2006). It also suggests that future research should incorporate specific targeting of facets into personality change interventions. Finally it provides some insight into the overall results of the study. That is the three domains which had the most facets targeted were neuroticism, conscientiousness and extraversion. These were the three domains that were found to have changed significantly over the intervention period. The two least targeted domains (agreeableness and openness) did not change. Consequently the lack of change in these domains may not be reflective of them being more difficult or unable to change, rather it may be that they did not change because participants did not want to change them.

These findings add to the expanding research that refutes the claim that past young adulthood personality does not and cannot be significantly changed. It suggests that people who are motivated are able to change their personality and that they can do this in a relatively short period



of time provided they are given the right resources. Furthermore it suggests that, at least for extraversion and neuroticism, these changes can be maintained after several months.

There are however a number of legitimate limitations to the current study which may need to be addressed in future research in order for the research supporting intentional personality change to be considered substantive. Perhaps the largest limitation is that only self-report measures were used. Consequently results may be subject to confounding effects such as common source and social desirability bias (De Fruyt & Van Leeuwen, 2014). This is a particular concern, considering that the intervention required the development of a close relationship between the coach and client. This limitation could be addressed in future research by using multiple informants for baseline and follow-up personality descriptions, who are unaware of the coaching objectives and targeted traits.

Another limitation is that the follow up data was taken only 3 months after the intervention had finished. The current study design is unable to determine whether these changes will be maintained throughout the lifespan.

In summary, the current study indicated that neuroticism significantly decreased and conscientiousness and extraversion significantly increased as the result of the application of a 10 week targeted personality change intervention. These changes were considered to be positive as increases in extraversion and conscientiousness and decreases in neuroticism are associated with increases in positive and decreases in negative life outcomes. An important component to this change appeared to be the specific targeting of facets. A number of limitations were discussed. However, this study should be considered as preliminary research into a new and important area. Personality has been found to have a wide reaching impact across people's lives. Consequently, the possibility of being able to change ones personality for the better is an exciting and important development in the coaching and personality literature.

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