Changes in personality in pre and post Dialectical Behaviour Therapy BPD groups: A question of Self-Control.

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Abstract

Dialectical Behaviour Therapy (DBT) is an evidence based therapy for people with Borderline Personality Disorder. Past research has identified behavioural changes indicating improved functioning for people who undergo DBT. However, to date there has been little research investigating the underlying mechanism of change. Our research utilised a between subjects design and self report questionnaires of Self-Control and the Five Factor Model of Personality and drew participants from a metropolitan DBT programme. We found that pre-treatment participants were significantly lower on Self-Control, Agreeableness and Conscientiousness when compared to both the post-treatment and the norms for each questionnaire. Neuroticism was significantly higher in both pre and post-treatment when compared to the norms. These findings suggest that Self-Control may play a role in both the presentation of this disorder and the effect of DBT. High levels of Neuroticism lend weight to Linehan's (1993) biosocial model of BPD development.

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The aim of this study was to investigate the impact of Dialectical Behaviour Therapy (DBT) on individuals with Borderline Personality Disorder in terms of changes in self-regulation and personality. There is now a growing body of research investigating the effectiveness of DBT (Elwood, Comtois, Holdcraft, and Simpson, 2002; Linehan, Armstrong, Suarez, Allmon, & Heard, 1991; van den Bosch, Koeter, Stijnen, Verheul, and van den Brink, 2005). This research has established DBT as an effective, evidence based therapy for the treatment of Borderline Personality Disorder (Robins and Chapman, 2004). To date the research investigating the effectiveness of this treatment has focused on measurable behavioural outcomes such as incidence and severity of self harm and length and frequency of hospitalisations. However, Lynch, Chapman, Rosenthal, Kuo and Linehan (2006) note that there has been very little research examining the basic processes or mechanisms underlying patient change.

Lynch *et al*. (2006) theorise that learning how to be mindful (through practising Core Mindfulness, a key element of DBT) requires the clients to learn how to control the focus of their attention "…without attempts to fix, alter, suppress or otherwise avoid" (p. 464) their emotions or experiences. Likewise, Linehan's (1993a) views are that it is the therapist's role to assist the client towards increasing levels of self-control and self-direction. Our primary hypothesis was that DBT brings about a change in self-regulation thus allowing for the expression of a more functional, rather than dysfunctional, personality.

Self-Control

The idea that clients' levels of self-control change due to DBT is an interesting one. The behaviour of individuals with Borderline Personality Disorder does appear to be under-controlled, or as Linehan (1993a) categorises it, dysregulated. Under-controlled individuals will usually "express affect and impulses relatively immediately and directly even when doing so may be socially or personally inappropriate" (Letzring, Block, and Funder, 2005, p. 397). Self-control is seen as a desirable characteristic to possess. High levels of self-control have been associated with achievement, performance, impulse control, adjustment, interpersonal relationships and moral emotions (Tangney, Baumeister and Boone, 2004). Rothbaum, Weisz and Snyder (1982) report that self-control is the ability to change and adapt the self to ensure a better or more optimal fit between the self and the world. In the diagnostic criteria for Borderline Personality Disorder, and in Linehan's alternate descriptors, it would appear, by definition, that lack self-control is a key feature of BPD.

Baumeister, Heatherton and Tice (1994) identified four domains of self-control: controlling thoughts, emotions, impulses and performance. These categorisations appear to be very similar to Linehan's (1993a) clusters of dysregulation in Borderline Personality Disorder. It is Tangney *et al*.'s (2004) position that the term self-control might be better conceptualised as self regulation, arguing that individuals who score highly on measures of self-control can modulate their behaviour dependent upon both internal and external cues, and environmental demands. This is typified by "…that ability to override or change one's inner responses, as well as to interrupt undesired behavioural tendencies (such as impulses) and refrain from acting on them." (Tangney

et al., 2004, p. 274). In light of this information it would be hypothesised that individuals with Borderline Personality Disorder would be low on self-control.

Tangney *et al*. (2004) considers self-control as being a component of an individual's personality. Tangney *et al*., (2004), has found that self-control correlates strongly with the trait of Conscientiousness from the Five Factor Model of Personality.

Borderline Personality Disorder and the Five Factor Model of Personality

The Five Factor Model has been developed within the area of normal personality theory and proposes that there are five personality dimensions underlying the variation of personality traits (Wilberg, Urnes, Friis, Pederson, and Karterud, 1999). Personality traits are defined as enduring "dimensions of individual differences in tendencies to show consistent patterns of thoughts, feelings and actions." (McCrae and Costa, 1990, p. 23). The five dimensions of this model are Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness.

These five traits have repeatedly been found in normal samples and cross culturally (McCrae and Costa, 1997). As these findings have been so universal, it is argued that extreme variants on the Five Factor Model dimensions can differentiate individuals who have personality pathology from individuals with normal personality (Wilberg, *et al*., 1999). Trull, Widiger, Lynam and Costa (2003) have reviewed the literature on research investigating profiles of individuals with Borderline Personality Disorder and the Five Factor Model and report that there is a positive correlation between Neuroticism and BPD and a negative correlation between both Agreeableness and Conscientiousness and BPD. That is, this is a population who are extremely neurotic, disagreeable and not conscientious. Additionally Wilberg *et al*. (1999) found

that Borderline Personality Disorder subjects produced low Extraversion but average Openness scores. These findings compliment Linehan's (1993a) belief that emotional dysregulation is at the core of the difficulties for the individual with Borderline Personality Disorder. The description of Neuroticism in the five factor model includes the idea that high scores on Neuroticism indicate people have a chronically high level of emotional instability (Costa and Widiger, 2005).

Given that extreme scores on measures of the Big Five have been found to differentiate between personality disorders (Wilberg, *et al*., 1999), and that individuals with Borderline Personality Disorder have been found to score highly on Neuroticism, and low on Agreeableness, Conscientiousness and Extraversion, we predicted that participants in our study would produce this Big 5 personality profile. A related prediction was that after undergoing DBT participants would then have personality profiles on the Five Factor Model that are within the normal score range.

This study is aimed at extending knowledge of Dialectical Behaviour Therapy and its impact on Borderline Personality Disorder by investigating the underlying changes that occur for people when they undergo DBT. While it has been found to be effective in randomised controlled trials (Linehan *et al*., 1991; van den Bosch, *et al*., 2005; Elwood, *et al*., 2002) there remains the question of what changes for this population as a consequence of therapy. Linehan (1993a) theorises that DBT teaches clients better methods of self-control, thus decreasing the dysfunction in the individual. Utilising existing psychometric tools in the area of Self-control and the Five Factor Model of Personality Linehan's (1993a) theory can be investigated. If she is correct then pre-treatment participants should show significantly different results on our research measures than post-treatment participants.

Our specific hypotheses were that: pre DBT participants will rate as under-controlled compared to post treatment participants who will score as more self-controlled; pre DBT participants will score high on Neuroticism and low on Conscientiousness, Agreeableness, and Extraversion compared to the normal population; post DBT participants will be less Neurotic and more Conscientious Agreeable and Extraverted compared to Pre-DBT patients, and; post DBT participants' mean scores on Neuroticism, Conscientiousness, Agreeableness, Openness and Extraversion will not be significantly different to the general population norms.

Method

Participants

Participants were drawn from a metropolitan Dialectical Behaviour Therapy programme provided by a therapy team attached to a private hospital. This programme is based on the model developed by Marsha Linehan (1993a, 1993b) and incorporates the four key elements of therapy: individual psychotherapy, skills training group, telephone counselling/coaching and the therapist consultation group. The inclusion criterion for this study was that all participants had a primary diagnosis of Borderline Personality Disorder.

Two groups were targeted for this study, the first group were individuals who were either on a waiting list for therapy, or who had started, but not completed their first 8 week skill building module. This group served as the control condition. The decision to include individuals who had started therapy in the control condition was made to maximise the likelihood of reaching sample sizes large enough to support statistical

analysis. As the therapy programme runs over 14 months the likelihood of significant changes in the individuals who have yet to complete their first module of skills training is unlikely, and therefore these individuals present with characteristics and traits more consistent with their pre treatment state rather than individuals who have successfully graduated from the programme.

The second group consisted of individuals who had successfully graduated from the DBT programme in the past three years. These participants represented the treatment condition. The decision to place parameters on how long ago people had finished therapy was twofold; first, to reduce the likelihood that change was as a result of something other than therapy, and; second, to increase the likelihood that participant numbers would be large enough to support analysis.

Research into Borderline Personality Disorder and Dialectical Behaviour Therapy has traditionally been typified by small sample sizes [e.g., Linehan (1993) n=44; Nee and Farman (2005) n=19]. Therefore for this current research, consideration needed to be given to ways that the sample size could be maximised.

Questionnaires were sent out to 32 people (17 pre and 15 post). In this study we had 17 participants (14 female, 1 male and 2 who did not identify their gender); an overall response rate of 56%. This was made up of seven individuals, five females and two who did not identify their gender, in the pre treatment group (response rate 29%). The mean age was 28.6 years and the standard deviation was 12.9 years. There were 10 participants in the post treatment group (1 male and 9 females; response rate 65%). The mean age was 31.6 with a standard deviation of 8.7 years.

Instruments

Two self-report questionnaires made up the battery used in this study: the Self-Control Scale (Tangney, *et al*., 2004) measuring self-control, and; the International Personality Item Pool inventory (IPIP, Goldberg, 1999) which is a measure of the Big Five personality traits. [A third questionnaire was included in the battery, the ER89 measure of Ego-Resilience (Block and Kremen, 1996) but was excluded from the final analysis due to the low Cronbach Alpha coefficient found in our sample (alpha= 0.63)].

Tangney *et al*. (2004) created a 36 item self-control questionnaire which uses a 5 point Likert scale (1 = not at all, to 5 = very much). Tangney *et al*. (2004) reported an alpha reliability coefficient of .85 from their study Self -Control in 255 undergraduate students. Items include "People would say that I have iron self-discipline" and "I'd be better off if I stopped to think before acting" (reverse scored).

The IPIP measure of the Big Five is freely available in the public domain (Goldberg, 1999) and is based on the Five Factor model. This scale correlates highly with Costa and McCrae's (1992) revised NEO Personality Inventory (Buchanan, Johnson and Goldberg, 2005). It is a 100 item questionnaire with participants rating their response on a four point scale (1= definitely true, 2= true on the whole, 3= false on the whole, and 4= definitely false). Each of the five factors has 20 items, half of which are reverse scored. Goldberg (1999) reports alpha reliability coefficients of .85 for Agreeableness, .90 for Conscientiousness, .91 for Extraversion, .91 for Neuroticism and .89 for Openness to Experience. Items include "I have a good word for everyone" (Agreeableness), "I am always prepared" (Conscientiousness), "I feel comfortable around people" (Extraversion), "Often feel blue" (Neuroticism), and "I Believe art is important" (Openness to Experience).

Procedure

Participants were invited to participate through a mail out. The mail out consisted of a covering letter (explaining the purpose of the study, consent, anonymity, and contact numbers for any questions), the questionnaires and a preaddressed reply paid envelope. Participants were asked to answer questions as they are now and not to reflect on either how they were in the past or how they would like to be in the future. A follow-up letter was sent to participants approximately eight weeks later. This letter thanked those who had responded and informed those who still wished to participate that they could still do so if they so wished.

The names and addresses of potential participants were obtained through the database held by the DBT programme. Status in treatment was accessed to allow allocation to either the control or treatment groups. The questionnaires were mailed out by staff from the DBT programme in envelopes that had the programme's return address. This ensured that the researchers had no access to sensitive client details and any letters that were "returned to sender" would not be sent to the researchers.

Results

The data from each questionnaire was entered into a spreadsheet and statistical analysis undertaken using Minitab Version 13. The questionnaires were scored by reverse scoring negatively worded items as indicated in the scoring protocol of each test and then summing items to produce a score for each construct measured. With regard to unanswered items, three participants left one question unanswered, one participant left

two questions and another participant did not answer three questions. For these participants their relevant trait scores were divided by the number of items answered and then multiplied by the number of items presented for that trait.

A Cronbach's Alpha reliability coefficient was produced for each questionnaire subtest (see Table 1). The Self-Control scale and each of the IPIP Big 5 traits all demonstrated acceptable reliability with coefficients ranging from .88 to .94. The results here are consistent with published reliability coefficients for these scales.

Table 1 reports the means, standard deviations, medians and norms for each scale. No Australian norms for the IPIP Big 5 scale have as yet been reported in the literature. However, the second author has used the IPIP Big 5 scale with several samples of psychology and medicine students (n = 1189) and this data was used to provide the norms for the IPIP Big Five scores. The norms for the Self-Control scale are from a sample of 255 North American undergraduate psychology students as reported in Tangney *et al*. (2004).

[Place Table 1 approximately here]

Due to the small sample size, the pre-treatment and post-treatment groups were compared nonparametrically using the Kruskal-Wallis test. While this test utilises medians for analysis, the means and medians have been reported in Table 1. The pre-treatment group produced significantly ($p \leq .05$) lower Self-Control, Agreeableness and Conscientiousness scores than the post-treatment group. No significant differences between the two groups were found for Extraversion, Neuroticism or Openness to Experience scores.

The One-Sample Wilcoxon Signed Rank Test, another nonparametric test, was used to compare the pre-treatment and post-treatment results to the norms for each construct (see again Table 1). This analysis found that, compared to the norm, the pre-treatment group produced significantly lower scores on the traits of Self-Control, Agreeableness, Conscientiousness and Neuroticism. However, the post-treatment group significantly differed from the norm only on the measure of Neuroticism. No other significant differences were found.

To further demonstrate the differences observed between pre and post treatment groups and scale norms Z scores for both groups were calculated (based on the norm means and standard deviations). The mean Z scores for each group are shown in Figure 1 which can be viewed as a personality profile of each group compared to the norm. The post-treatment group can be seen to be more normative than the pre-treatment group with the exception of the trait of Neuroticism.

[Place Figure 1 approximately here]

Discussion

This study was designed to investigate four hypotheses. These were, firstly, that participants prior to therapy would rate as under-controlled on a measure of self-control. Data analysis supported the first hypothesis by finding that pre-treatment participants were significantly under-controlled when compared to both post-treatment participants and the findings of Tangney *et al* (2004) which were used as norms in this instance..

The second hypothesis was that the pre-treatment participants would score highly on Neuroticism, and have low Conscientiousness, Agreeableness, and Extroversion compared to the normal population (Australian psychology and medicine students in this instance). Pre-treatment participants did produce significantly higher Neuroticism scores and lower Conscientiousness and Agreeableness mean scores compared to the norms. However there was no significant difference between the pre-treatment group scores and the norms for Extraversion or Openness to Experience.

The third hypothesis was that post-treatment participants would be less Neurotic and more Conscientious, Agreeable, and Extraverted when compared to pre-treatment participants. This hypothesis was partially supported in that the post-treatment participants produced significantly higher Conscientiousness and Agreeableness scores. However, pre and post treatment Extraversion and Neuroticism scores were not significantly different.

The final hypothesis was that the scores on Neuroticism, Conscientiousness, Agreeableness, and Extraversion, for participants who had completed DBT, would be no different to the norms. The data analysis found that this was supported for all traits except for Neuroticism, where post-treatment participants remained as high on Neuroticism as pre-treatment individuals.

The overall findings were that significant personality differences were observed between the pre and post treatment groups. Participants who had not yet received DBT had low self-control, were less agreeable and less conscientious compared to the post treatment group and the psychology and medicine student scores we used as norms. Participants who had received DBT were just as self-controlled, agreeable and conscientious as the norm. But both pre and post treatment participants were highly

neurotic compared to the norm. Our findings have implications for our understanding of DBT and what occurs for individuals who have a personality that is considered to be disordered.

Self-Control

Self-control was assessed in this study using Tangney *et al*.'s (2004) definition and assessment tool. In their definition Tangney *et al*. (2004) liken self-control to self-regulation – "the ability to regulate the self strategically in response to goals, priorities, and environmental demands" (p. 314). Tangney *et al*. found that higher levels of self-control were positively correlated to better adjustment, less pathology, better relationships and interpersonal skills and more optimal emotional responses. These findings have clear links to the difficulties the Borderline Personality Disorder population experiences. As noted earlier, Linehan (1993) theorises that the BPD population have, at the core of their struggle, an emotional regulation system that is dysfunctional. This then negatively impacts upon many areas of an individual's life, including the ability make and maintain relationships, and to be interpersonally effective. Such negative impacts also include increased use of mental health services.

The results of our study support the view of both Linehan (1993) and Tangney *et al*. (2004), in that the hypothesis that pre-treatment participants would rate significantly lower on the self-control measure compared to post treatment participants and the norms was supported. The results also showed that self-control scores were higher for the post-treatment group. What this means for the BPD population is that their low levels of self-control contribute to the difficulties they have in their daily lives and that DBT appears

to help individuals develop strategies and insight into their behaviours that subsequently assists them to develop greater levels of self-control.

One of the characteristics of individuals with Borderline Personality Disorder is that they are frequently confused about their own identity, or sense of self. Generally their personal histories have been so traumatic that they have learned to disregard, or suppress, their own feelings and interpretations of events. Consequently they tend to take cues from the environment to help inform themselves on how to act and what to think and feel (Linehan, 1993). As the name of their diagnosis would suggest, their personality is disordered. Increasing the level of self-control for these individuals would produce more stable, consistent and context independent behaviours, suggestive of a more ordered personality. This in turn, would allow them to rely on their own emotional cues and personal needs to inform their reactions and behaviours.

Our research has suggested that DBT increases self-control as measured by self report. However it is not possible to evaluate whether DBT has actually increased levels of self-control or whether the therapy has allowed for the expression of pre-existing levels of self-control that were perhaps masked or skewed due to life events. An increase in an individual's level of self-control, caused by either increasing existing levels or through assisting the person to reduce the impact of masking events, is a powerful way to reduce the chaotic lives lived by people with Borderline Personality Disorder.

There are of course factors that limit the interpretation of the results of this study and these include the small sample size and study design. In any research a small sample size runs the risk of providing skewed results that are not representative of the larger population being studied (Salkind, 2004). To definitively state that there is a

causal link between changes in self-control and improved functioning for people with Borderline Personality Disorder a study having a much larger sample size and utilising a within subjects design would have to be completed.

Five Factor Model

Research into the Five Factor Model has found that individuals with Borderline Personality Disorder are neurotic, disagreeable and not conscientious (Trull *et al*., 2003) and introverted (Wilberg *et al*., 1999) and that they sit at the extremes of the scales developed to measure normal personality dimensions. The results of our study also found pre-treatment participants scored highly on Neuroticism and low on both Agreeableness and Conscientiousness but, unlike the Wilberg *et al.* study, no differences were found on Extraversion. The trait of Openness appears to be quite unrelated to BPD.

When descriptions of the trait of Conscientiousness and description of self-control are compared, there appears to be strong similarities. Costa and Widiger (2005) offer a clear description of the trait of Conscientiousness:

> *"Conscientiousness assessed the degree of organisation, persistence, control, and motivation in goal-directed behaviour. People who are high in conscientiousness tend to be organised, reliable, hardworking, self-directed, punctual, scrupulous, ambitious, and persevering, whereas those who are low in Conscientiousness tend to be aimless, unreliable, lazy, careless, lax, negligent and hedonistic."* (p. 6)

The descriptors of "self-directed" and "persevering" dovetail well with the concept of self-control and it may be that the significance seen in this study on both Self-Control and Conscientiousness is related because of an underlying link between these two

concepts. It should also be noted that there was a significant positive correlation between the constructs of Conscientiousness and Self-Control (r=.87) in our study and that Tangney *et al*. (2004) found a correlation of r=.54 in her study, adding weight to the idea that these two constructs are strongly related.

The lack of change in Neuroticism between pre-treatment and post-treatment participants when compared to the norms is a finding quite in keeping with Linehan's views. Linehan (1993) clearly articulates in her biosocial theory of the development of Borderline Personality Disorder that this is a group of people who have an underlying emotional sensitivity that is then combined with an invalidating environment. It is her proposition that emotional sensitivity is something that the person is biologically predisposed towards. Again Costa and Widiger (2005) provide a good descriptor of the trait labelled Neuroticism:

> *"Neuroticism refers to the chronic level of emotional adjustment and instability. High Neuroticism identifies individuals who are prone to psychological distress."* (p. 6)

The fact that this population rates very highly on the trait labelled Neuroticism, and importantly that our results suggest that it does not change after therapy, is supportive of Linehan's (1993) argument for a biosocial theory as the basis for development of the disorder.

The important question when looking at the results relating to the Five-Factor Model is - What exactly happened to these individuals who underwent Dialectical Behaviour Therapy? Personality traits are thought of as enduring "patterns of thoughts, feelings, and actions" (Costa and Widiger 2005, p. 5). If this is true, then what does this mean for the post-treatment participants to have scores on Agreeableness and

Conscientiousness that were no different to the norms? For the post-treatment individuals to have scores on Agreeableness and Conscientiousness that were no different to the norms, also appears to be contrary to Trull *et al.*'s (2003) finding that people with BPD are significantly lower on Agreeableness and Conscientiousness when compared to the "normal" population. While our between-subjects study obviously limits the inference we can draw, our findings very cautiously suggest that DBT increases levels of Agreeableness and Conscientiousness.

It is possible that the post-treatment individuals have had a change in their personality traits, however it is also possible that due to the traumatising life events these individuals have experienced their developing personality became disordered or that development was arrested. Thus these individuals never developed the ability to express their personality in an ordered way. A personal anecdote suggesting this idea came from a conversation one of us (JD) had with an individual with Borderline Personality Disorder. This individual stated that her father was of the opinion that because of all the terrible things that happened to her as a child she never had the opportunity to learn how to "cope with life". This explanation of her difficulties had significant resonance for her and she now holds the belief that DBT is offering her the opportunity to learn the skills she failed to learn in her childhood and adolescence. Perhaps then individuals with Borderline Personality Disorder develop skills and strategies while in therapy to help them manage the stressors and stimuli in their environment to such a degree that their natural personality, one that could always have been present, has the opportunity to be expressed. But in order to answer the question "What happened to these individuals as a result of the therapy they undertook?" further within-subjects study is required.

Another extension of our research would be to measure not only the trait level of this the Big Five Model but the facet level as well using an instrument such as the NEO-PI (Costa and McCrae, 1992). Costa and McCrae (1992) provide six facet dimensions for each trait. This level of exploration would allow for research to more closely analyse the changes that might be occurring as a result of undergoing DBT.

Conclusion

To date there is no published research investigating exactly what changes for individuals with Borderline Personality Disorder when they undergo Dialectical Behaviour Therapy. DBT is an evidence based therapy with clear efficacious impact but this is measured through behavioural markers such as reductions in self harm and suicidal thoughts. Our research has served as a beginning point for future research into this area as it has found significant relationships between aspects of both personality and self-control that appear to have altered as a result of therapy. Our study cannot conclusively determine whether these individuals have changed their personality or whether their underlying personalities can now be expressed as a result of the therapeutic process. Much more research would be needed in order to answer this "chicken or the egg" question. What our research does is highlight a link between self-control and the traits related to the presentation of "disordered" personality and a future area of research that may help to further refine therapy for this population.

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Table 1:
Pre-Treatment and Post-Treatment Means, Medians, Norms and Cronbach Alpha Reliability Coefficients for Each Trait Measured.

	Pre-treatment		Post-treatment		Norms		
	Mean Median	SD	Mean Median	SD	Mean Median	SD	Alpha reliability
Self-Control	26.0 23.0[a]	9.4	35.9 37.5[b]	11.8	39.2 39[b]	8.6	.88
Extraversion	55.0 56.0	11.1	53.1 52.5	9.5	57 58	10.7	.88
Agreeableness	49.3 50.0[a]	5.5	60.7 63.0[b]	11.2	60 61[b]	7.6	.89
Conscientiousness	43.1 40.0[a]	12.9	55.6 58.5[b]	12.1	57 58[b]	8.5	.94
Neuroticism	68.3 68.0[a]	5.3	64.3 67.5[a]	12.2	45 44[b]	10.1	.91
Openness to Experience	68.1 73.0	8.5	64.2 65.0	7.5	61 62	8.1	.82

Notes: Medians with different superscripts indicate significant differences at $p \leq .05$

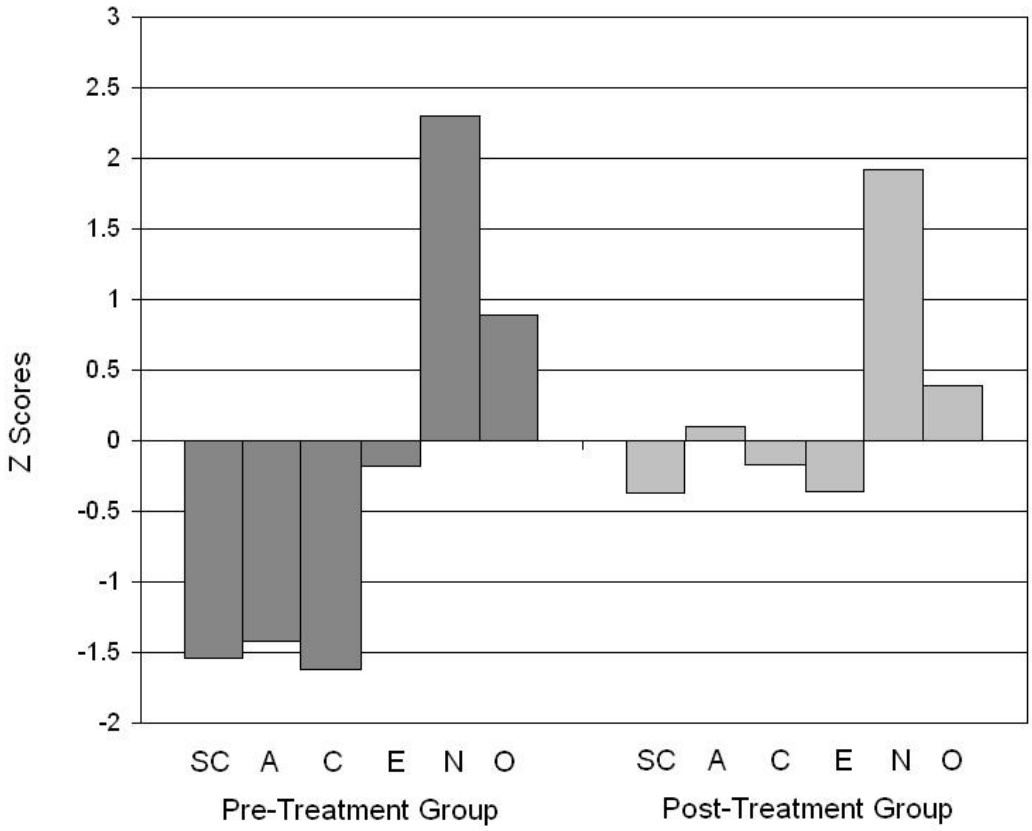

Figure 1: *Z Scores for Pre-Treatment and Post-Treatment groups for Self-Control (S), Agreeableness (A), Conscientiousness (C), Extraversion (E), Neuroticism and Openness (O).*