

NEW INSIGHTS INTO THE NATURE OF HYPNOTISABILITY

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Introduction

Since the first demonstrations of hypnosis it was apparent that there were considerable individual differences in susceptibility (Braid, 1843). E. R. Hilgard's pioneering research on hypnotic susceptibility with scales developed at Stanford (Hilgard, 1965) demonstrated that hypnotic susceptibility follows an approximately normal distribution in the population, though with a positive skew and often a second peak approaching bimodality in the exceptional susceptibility range. Through evidence of high retest reliability with scales over 25 years Hilgard regarded this as a personality trait (Hilgard, 1986).

In the context of this symposium hypnotic susceptibility will be viewed as an exceptional ability, one which has important implications for the therapeutic relationship and which is predictive of a positive response not only to hypnosis, but to a range of psychological therapies.

Hypnotic Susceptibility and Schizotypy

The question of the nature of hypnotic susceptibility has occupied scientists throughout the 20th century and has resisted satisfactory elucidation. Here we will begin with new insights afforded by two recent investigations examining data collected in London and Rome exploring the relation between hypnotic susceptibility measured in London with the Harvard Group Scale of Hypnotic Susceptibility (HGSHS), Form A (Shore and Orne, 1962), and in Rome with an individualised assessment with the Stanford Hypnotic Susceptibility Scale (SHSS), Form C (Weitzenhoffer and Hilgard, 1962). Both assessments were correlated with

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the Personality Syndrome Questionnaire (PSQ, Gruzelier et al, 2002) consisting of activated, withdrawn and unreality syndromes of schizotypy.

The impetus arose from a case of first episode of schizophrenia with a comprehensive range of psychotic symptoms, diagnosed within a week of stage hypnosis (Allen, 1995). An action was brought against the entertainer before the High Court in London (see Gruzelier, 2000), and while the Court did not accept causation, no explanation other than stage hypnosis could be provided as to the precipitation of schizophrenia in a man who had survived a range of major life event stressors without the development of schizophrenia (Gruzelier, 2000). The Court preferred the explanation that schizophrenia was genetically inevitable, evidence which is refuted by the concordance rates in monozygotic twins which are less than 0.5. While the hypnotic susceptibility of the plaintiff was not formally assessed, there was agreement that his star performance throughout the show was compatible with high hypnotisability. Aside from the cognitive and neurophysiological affinities between schizophrenia and hypnosis such as the disorder/suspension of reality testing and the alteration of connectivity with anterior brain regions, another implication of this tragedy was a possible relation between hypnotic susceptibility and a personality predisposing to psychosis, in this instance the schizotypal personality.

London Investigation of Schizotypy in Relation to Hypnotic Susceptibility

In the first study examining the possible relation between schizotypy and hypnotic susceptibility, 83 medical students of both sexes from the Faculty of Medicine at Imperial College of Science, Technology and Medicine were examined for correlations between the 84 items of the PSQ and the hypnotic susceptibility score obtained with the HGSHS (Jamieson and Gruzelier, 2001). Importantly the two assessments were obtained in two independent contexts where neither the participants nor the experimenters were aware of any future analysis of the relations between the two, and therefore were free of any context bias.

Data from this study has shown that 15/84 items were significantly correlated, all in the direction of high schizotypy and high hypnotic susceptibility. The 15 item subscale correlated $r = 0.43$ ($p < 0.005$) with

hypnotic susceptibility, with a high internal consistency (Cronbach's alpha, 0.77). The items are shown in Table I categorised according to unreality (5), activated (8), and withdrawn syndromes (2). The majority (13/15) of items depicted positive features of schizotypy with a strong verbal, cognitive flavour.

Roman Replication of Relations Between Schizotypy and Hypnotic Susceptibility

With the collaboration of Vilfredo de Pascalis in Rome we examined the relation between the PSQ syndromes and a scale of hypnotic susceptibility containing a higher loading of cognitive items than the HGSHS. This was the SSHS, Form C (Weitzenhoffer and Hilgard, 1962) which was administered individually, in this case to female psychology students (N = 74). As in the first study the assessment contexts were independent. The results showed significant correlations between 12 items, all in the direction of high schizotypy and high susceptibility. The 12 item subscale correlated $r = 0.56$ ($p < 0.01$) with hypnotic susceptibility and exhibited a high internal consistency (Cronbach's alpha, 0.75). In Table II the items are presented categorised by syndrome. Here the majority belonged to the unreality syndrome (9/12), of which 6 were cognitive aspects of unreality, 2 were perceptual and 1 paranoid, while 3 belonged to the activation scale.

Synthesis of the Nature of the Relations between Schizotypy and Hypnotic Susceptibility

Positive features of schizotypy were found to be in the majority. With the Harvard scale (HGSHS, Form A) which consists of predominantly motoric items those students who were more cognitively activated were responsive to instructions of hypnosis whereas in the students examined with the more cognitively loaded Stanford scale (SSHS, Form C) cognitive aspects of unreality, often referred to as magical thinking, (Chapman and Chapman, 1980), were in the majority. Furthermore of these cognitive items, 5/6 in the Italian study concerned extrasensory perception. We know from extensive work with the PSQ in London with medical students admitted to Imperial College where all students undertake a science degree

in addition to medicine, that unreality scores on average are lower than in the university population at large and instead students score higher on other aspects of schizotypy, notably cognitive activation.

The main features of schizotypy across the two investigations that were associated with hypnotic susceptibility were as follows.

1) Having a deeply vivid quality to thoughts and perceptions; the item "my thoughts are so strong sometimes I can almost hear them." was identified in both samples.

2) Belief in the supernatural and other psychic phenomena.

3) A rapid, free flowing association of thoughts and ideas :- going off on tangents, using words in unconventional ways, being flooded by thoughts and possibilities, saying one thing and meaning another.

4) Perceptual alteration in visual, auditory and olfactory modalities.

Aspects which were recorded but which represent only a small number of possible items in the scale were as follows.

1) A degree of paranoid suspiciousness.

2) A degree of odd behaviour.

3) In the London sample only, aspects of withdrawal.

Personality Correlates of Hypnotic Susceptibility

In considering the contemporary landscape, reviews of the personality correlates of hypnotic susceptibility contain the following dimensions:- absorption, imaginative involvement, vividness of imagery, perceptual alteration, fantasy proneness, creativity, and effortless experiencing. These will be considered in turn for any affinities with schizotypy. Psychopathology as such is absent from the list, implying a novel relation, or at least one discarded or out of fashion. If one considers the history of the subject the very first correlate was considered by Charcot to be hysteria (Thornton, 1976), and in mid 20th century investigations neuroticism and repression were also considered.

Absorption.

To date absorption, typically measured with the Tellegen and Atkinson (1974) scale, is generally regarded as the best correlate of hypnotic susceptibility, with an average correlation of about $r = 0.27$

(Kihlstrom et al, 1980; de Groh, 1989) with females showing stronger relations than males. Low absorption scorers generally show a more consistent correlation with hypnotic susceptibility with greater variance among high absorption scorers, some of whom are hypnotically unsusceptible. Some elucidation of the variance has been proffered by Nadon et al (1987) who differentiated high from medium susceptibility by a preference for high absorption scorers to think in images and importantly have *a belief in the supernatural*. Additionally Evans and colleagues (1990) have shown that it is the ability for controlled absorption rather than spontaneous absorption that is associated with high hypnotic susceptibility.

Vividness of Imagery.

Several scales have been designed to measure imagery vividness. On balance there is a low to moderate correlation with hypnotic susceptibility (Kirsch and Council, 1992). de Groh (1989) posited that a nonlinear relation is due to a wider variance among low scorers, some of whom report vivid imagery.

Perceptual Alteration.

Perceptual alteration is a common feature of schizotypy forming one of the subscales of the PSQ and constituting the perceptual aberration scale of Chapman and colleagues (Chapman et al, 1978). Notwithstanding the construct of perceptual alteration has arisen in the hypnosis field independently of schizotypy. Sanders (1986) following Hilgard's neodissociation model of hypnosis, designed a scale selecting items from the Minnesota Multiphasic Personality Inventory, a scale comprised of psychopathological dimensions. Whereas some modest correlations have been found with the scale by a number of independent investigators, the study of Green et al (1991) demonstrated that these depended on the context being perceived to be associated with hypnosis and the relation was absent when the context in which the PA scale was administered was independent.

Imaginative Involvement.

Historically imaginative involvement in suggestion-related fantasy has played a central role in thinking about the nature of hypnosis (Braid,

1843; Bernheim, 1884). Lynn and Sevic (1992) have noted that imagination, daydreaming and fantasy are not readily distinguishable, and imaginative involvement in suggestion-related fantasy has been judged as one of the few common factors that unite the disparate theories of hypnosis (Lynn and Rhue, 1991). Importantly increased spontaneous and instructed imagery and fantasy is one of the key subjective experiences of hypnosis (Hilgard, 1979), one which emerges with an effortless quality (Fromm, 1979).

Fantasy Proneness.

Wilson and Barber (1981) have described as a feature of hypnotisability a propensity for involvement in a private world of fantasy, for having vivid daydreams and seemingly *paranormal psychic and out of body experiences*, having the ability to hallucinate objects, to experience fantasies 'as real as real', and with occasional difficulty in distinguishing reality from unreality. While fantasy proneness correlates highly ($r = 0.75$) with absorption (Lynn and Rhue, 1986), and high fantasy proneness is associated with experience of a worldwide variety of paranormal events with belief in their validity (Council and Huff, 1990) relations with hypnotic susceptibility have been at best moderate, though have been free from testing context effects. As with absorption the difficulty has been in distinguishing between medium and high scoring individuals who are fantasy prone (Council and Huff, 1990). Notwithstanding Rhue and colleagues found that 80% of fantasisers were highly hypnotisable, and high fantasisers were more creative (Lynn and Sivec, 1992).

Creativity.

Beginning with the work of Bowers and Bowers (1979) a body of evidence has supported higher scores of highly hypnotisable subjects on creativity measures, moreso in females, and there has been strong advocacy of the metaphor of the hypnotisable subject as a creative problem-solving agent (Lynn and Sivec 1991). Nevertheless correlations have been moderate and have tended not to distinguish medium and high hypnotisable subjects.

Effortlessness and creative flow have often been ascribed to the creative process. As the novelist Thakerey once observed "I have been surprised at the observation made by some of my characters. It seems as if an occult power was moving the pen." This facility has been likened to

a greater than normal capacity for transition from an active to a passive mode of thinking (Shames and Bowers, 1992), concurrent with a shift from left to right hemispheric involvement. In this regard MacKinnon (1971) has commented "One might inquire, then, about the ease and the speed with which the creative person... falls asleep, enters into a hypnotic trance..., or passes into self-induced states of trance or semi-trance."

Cognitive and Physiological Flexibility

Evans has carried out a series of studies (Evans, 1969-91) on hypnotisability and the flexible control of sleep. With experiments totaling 640 subjects the ease of falling asleep, of staying asleep and the flexibility of sleep patterns has been associated with hypnotisability. Furthermore the ability to respond to suggestion in sleep in the REM phase correlates positively with hypnotisability and with the facility for falling asleep in the laboratory. This phenomenon is important because it signifies dissociative control outside of awareness and volition.

Evans and Graham (1977) extended the flexibility concept further by showing that random number generation was a facility associated with high hypnotic susceptibility. Crawford (1989) and Crawford and Gruzelier (1992) have also used this concept as an explanatory construct when reviewing cognitive and neurophysiological findings that have differentiated high from low hypnotic susceptibility. These have included task-related hemispheric specificity found only in highly susceptible subjects independent of hypnosis, along with functional neuropsychophysiological changes as a result of hypnotic instructions. Shames and Bowers (1992) have theorised that both hypnotisability and hypnosis are associated with an ability to prime wider networks of association between cortical representational networks.

Summary

The consideration of currently acknowledged personality correlates of hypnotic susceptibility for correspondence with our results on schizotypy syndromes has disclosed a number of points of association. Absorption, fantasy proneness and creativity were linked with magical thinking which characterises the cognitive aspect of unreality in schizotypy

associated in schizophrenia with delusional beliefs. Alterations and dissociations of perception are identical with the perceptual aspect of unreality in schizotypy, associated in schizophrenia with hallucinations. Vividness of imagery was associated with having a deeply, vivid quality to thoughts and perceptions a feature recorded in both the London and Rome samples. Finally the cognitive and physiological flexibility of highly hypnotisable subjects has a bearing on the cognitive activation syndrome of schizotypy inferred from the rapid, free-flowing association of thoughts and ideas in schizotypy.

What was clearly absent from the personality correlates of hypnotisability was any direct expression of the possible associations between hypnotic susceptibility and psychopathology.

Rediscovery of Associations with Psychopathology

The 19th century view was that hysteria was a prerequisite for hypnotisability (Charcot, 1882), a view which found support in one personality questionnaire study with the MMPI and 34 moderate to high hypnotically susceptible subjects (Sarbin, 1950). Early in the 20th century hypnotisability was thought to provide a diagnostic marker able to differentiate a neurotic from a psychotic disorder, and later there were studies with neuroticism and repression questionnaires. Eventually the consensus based on extensive investigation indicated that schizophrenic patients show a normal distribution of hypnotic susceptibility when age differences between samples was taken into account (Lavoie and Sarbourin, 1980). One could deduce that those more likely to possess the higher hypnotic susceptibility were patients with positive-like symptomatology (Gruzelier, 2000).

In fact what has been overlooked is that some studies utilising the MMPI have disclosed replicable evidence of schizotypy, psychosis-proneness and neurotic manifestations in association with hypnotisability, but this evidence was not fully elucidated at the time (Hilgard, 1965). In the book *Hypnotic Susceptibility*, which is based on studies at Stanford by E.R.Hilgard and colleagues (1965), two studies were reported involving administration of full or selected abbreviated versions of the MMPI to sizeable samples. In the first study 100 students consisting of equal numbers of both sexes were examined and MMPI subscale correlations were

examined with the SSHS, Form C assessment of hypnotic susceptibility. Correlations that were significant at the $p < 0.05$ level were found with the following scales:- schizophrenia, hypomania, hypochondriasis, psychopathic deviate, psychasthenia and anxiety. In a replication study with 252 students only some scales in an abbreviated form were included; the schizophrenia scale was excluded. Significant relations included hypomania (especially in males) and hypochondriasis. It was important to note that the scores overall were in the normal range, given that the MMPI was designed to identify clinically significant levels of psychopathology for diagnostic purposes. The implications for personality were overlooked at the time because of the implication that "The positive correlations with the pathologically named MMPI scales suggest the misleading conclusion that the more morbid subjects were the more hypnotisable", and the positive correlation with affirmative answers suggesting a response bias.

Germane to our results was the evidence in healthy students of:
 schizotypy (schizophrenia scale),
 cognitive activation (hypomania scale),
 unreality experiences (common to both schizophrenia and hypomania scales).

Cognitive and Neurophysiological Affinities: Lateral Asymmetry in Hemispheric Activation

Neurophysiological and cognitive investigations have disclosed affinities between the activated schizotypy syndrome and high hypnotic susceptibility through measures of hemispheric functional asymmetry. The activated syndrome of schizophrenia and schizotypy was originally delineated by classifying unmedicated schizophrenic patients on the basis of lateral asymmetry in electrodermal orienting responses (subsequently replicated by other psychophysiological and cognitive indices) on the basis of which an activated syndrome was distinguished from a withdrawn syndrome (Gruzelier, 1999). The positive symptom activated syndrome was accompanied by a left>right functional preference, while a negative withdrawn syndrome was accompanied by a right>left functional preference (Gruzelier, 1984). A third unreality syndrome was unassociated with functional asymmetry. Subsequently a similar syndromal structure

was found in university students assessed with schizotypy questionnaires (Gruzelier, 1996), in whom the activated and withdrawn syndromes were associated with cognitive asymmetries in verbal and non-verbal recognition memory (Gruzelier and Doig, 1996), as in schizophrenia (Gruzelier et al, 1999a,b), as well as with opposite asymmetries in lateral direction sense (Richardson and Gruzelier, 1994). In schizotypy validation was further obtained from self report activation scales, while prospective evidence of extreme face>word recognition memory asymmetry predicted a withdrawn/unreality syndrome in a student who developed a first and second episode of schizophrenia (Gruzelier and Doig, 1996). In sum cognitive activation was associated with a left hemispheric functional advantage.

Neuro-psychophysiological studies have disclosed that a left hemispheric activational preference often has characterised subjects with high hypnotic susceptibility in contrast to subjects with low hypnotisability (Gruzelier, 1998). This has been demonstrated with bilateral electrodermal orienting response amplitudes, unimanual haptic discriminations and controlled verbal fluency (Gruzelier et al, 1984; Gruzelier and Brow, 1985; Gruzelier and Warren, 1993). This evidence was outlined at the 3rd Bial symposium (Gruzelier, 2000).

Exceptional Ability and Psychosis Proneness

It is quite a misconception to ascribe compromised and inferior ability to healthy subjects with schizotypal personalities; our students were high achieving medical students. The same is true for schizophrenia, as strongly advocated in a new provocative theory of the evolution of man and culture through schizotypal characteristics (Horrobin, 2001). As Horrobin documents when Henry Maudsley, whose name was given to England's foremost mental institution, considered the implications of eugenic programmes for the reduction of psychiatric illness, a controversial issue in the 19th century, he concluded against the notion because "I have been surprised at finding how often insanity has appeared among the near relatives of exceptionally able men". Similarly from the USA, Myerson and Byers (1941) examining the records of the foremost hospital in Boston, McLean Hospital, commented that patients were sent to the hospital from families with "Presidents of the United States; philosophers

of national importance; writers who have founded schools of literature; scientists in every field from astronomy to chemistry; medical men galore around whose names significant developments have clustered".

In the landmark study of Heston (1970) focussing on children of a schizophrenic parent who were adopted away and raised by parents without psychopathology, while they were observed to have a higher incidence of schizophrenia (10% compared with 1% in the normal population), there were more gifted as well as mentally retarded children, more psychopathy and more children who were philosophically religious, creative, imaginative and musically gifted.

The following are among significant contributors to the world of the arts and ideas who had schizotypal personalities, or who developed psychotic episodes themselves, or who had first degree relatives who did: Balzac, Baudelaire, Berryman, Byron, Browning, Clare, Coleridge, Comte, Conrad, Dickens, Donne, Eliot, Fitzgerald, Greene, Gogol, Hemingway, Holderin, Hopkins, Huxley, Jarrell, Joyce, Kafka, Lowell, MacNiece, Mann, Plath, Poe, Pound, Proust, Roethke, Shelley, Schiller, Schwartz, Sexton, Smart, Steinbeck, Strindberg, Swift, Williams, Woolf among writers; Carrington, Gaugin, Michelangelo, Picabia, Pollock, Raphael, Rothko, Turner, van Gogh among painters; Beethoven, Berlioz, Chopin, Donizetti, Dvorak, Gurney, Handel, Puccini, Rossini, Schumann, Schubert, Tchaikovsky, Tippett, Wagner among composers; Ampere, Copernicus, Darwin, Edison, Einstein, Faraday, Jung, Kant, Linnaeus, Mendel, Nash, Newton, Pascal, Ruskin, Russell, Wittgenstein among scientists and philosophers.

Conclusion

In conclusion the relation between schizotypy and hypnotisability would appear to be a real one. It has been shown to be a replicable relation, and in our initial studies a sizeable one. Supportive of these contemporary findings would appear to be the earlier studies of Hilgard and colleagues (Hilgard, 1965) with the MMPI, though alternative interpretations are possible. The relation was shown to be syndromal and supports the move towards syndromal analyses of psychosis-proneness and schizophrenia. There is also an implication in the results that hypnotisability would also profit from a syndromal analysis, in so far

as there were differences in the correlates with schizotypy syndromes between the largely motoric HGSHS and the SSHS, Form C with its higher cognitive loading.

In the contemporary context an association between schizotypy and hypnotic susceptibility is a novel perspective. However, Pavlov (1944) regarded schizophrenia as a chronic state of hypnosis, and was not alone in discerning affinities between psychosis and hypnosis, as was theorised by psychoanalysts half a century ago (see Gruzelier, 2000). One implication is whether a therapeutic approach that may manipulate the interplay between reality and unreality experiences may have therapeutic applications in patients where this interplay is disordered (Guze, 1967). Recent research has questioned whether neurophysiological approaches may be directed towards these aims (Gruzelier et al, 1999b)? These affinities also make sense of how an improper use of hypnosis could trigger schizophrenia in a schizotypal personality (Gruzelier, 2000). Importantly such tragedies could be avoided by the screening of vulnerable participants for stage hypnosis with questionnaires such as the PSQ measures of positive syndrome schizotypy. Not only does the schizotypy perspective offer a new approach to personality correlates of hypnotic susceptibility, a field that has run out of steam, but it adds support to dissociation theory in hypnosis as social psychologists attempt to explain hypnosis away.

The readership of this volume with interests in psi phenomena will have resonated to the recurring leit motif of the appearance of psi phenomenology. This is seen both with regard to the various personality correlates of hypnotisability, and with regard to the significant contribution of "magical thinking" to the positive features of schizotypy that correlated with hypnotic susceptibility. Schizotypy together with its neuroscientific basis may well offer a new perspective on exceptional psi ability, just as other correlates of hypnotisability such as absorption, vividness of imagery, perceptual alteration, fantasy proneness and imaginative involvement are numbered amongst attributes of participants with exceptional psi ability. Furthermore processes that are involved in hypnosis (Gruzelier, 2001) may apply equally to receptivity to psi phenomena. It may even be the case that hypnosis in the right hands, in other words with the appropriate instructions, may facilitate psi experiences.

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Table 1. *Schizotypy items listed by syndrome which significantly correlated with hypnotic susceptibility in the London study.*

Unreality Syndrome

2. Sometimes things on TV or radio have a hidden meaning for me. ($r = 0.286$; $p = 0.005$).

22. I never or rarely feel that other people have got it in for me. ($r = 0.199$; $p = 0.036$).

62. Everyday things often seem unusually large or small. ($r = 0.200$; $p = 0.035$).

79. I sometimes feel distracted by sounds I am not normally aware of. ($r = 0.206$; $p = 0.031$).

82. My thoughts are sometimes so strong that I can almost hear them. ($r = 0.240$; $p = 0.015$).

Activated Syndrome

17. People sometimes comment on my unusual mannerisms or habits. ($r = 0.190$; $p = 0.043$)

23. I always keep to the point when speaking and never go off on tangents. ($r = -0.213$, $p = 0.027$).

26. Sometimes every thought I have immediately suggests an enormous number of ideas. ($r = 0.202$, $p = .034$).

42. I am often thought of as a very bizarre person. ($r = 0.189$, $p = 0.043$).

57. I sometimes find it difficult to put together what people are saying to understand their meaning. ($r = 0.223$, $p = 0.021$).

64. I sometimes use words in unusual ways. ($r = 0.222$, $p = 0.022$).

69. I sometimes have such a wide range of interests that I often don't know what to do next. ($r = 0.188$, $p = 0.044$).

74. I sometimes find that I say one thing and mean just the opposite. ($r = 0.270$, $p = 0.007$).

Withdrawn Syndrome

3. I sometimes avoid going to places where there will be lots of people because |I think I will get anxious. ($r = 0.189$, $p = 0.043$)

46. My non-verbal communication (smiling and nodding during conversation) is good. ($r = -0.199$, $p = 0.035$)

Table 2. *Schizotypy items listed by syndrome which significantly correlated with hypnotic susceptibility in the Rome study.*

Unreality: Cognitive

15. I believe in telepathy (mind reading). ($r = 0.271$, $p < 0.020$)

16. I have never sensed some person or force around me when alone. ($r = -0.386$, $p < 0.001$)

39. I don't believe in clairvoyance (fortune telling). ($r = -0.231$, $p < 0.047$)

60. I have never had an experience with astrology, seeing the future, UFO's, ESP or a sixth sense. ($r = -0.237$, $p < 0.042$)

71. I have never felt that I am communicating with another person telepathically (mind reading). ($r = -0.331$, $p < 0.004$)

82. My thoughts are so strong sometimes I can almost hear them. ($r = 0.305$, $p < 0.008$)

Unreality: Perceptual

28. When looking at a person or myself in the mirror, I have never seen the face change right before my eyes. ($r = -0.294$, $p < 0.011$)

72. My sense of smell sometimes becomes unusually strong. ($r = 0.370$, $p < 0.001$)

76. I never or rarely feel that other people have it in for me. ($r = -0.233$, $p < 0.046$).

Activation

29. Sometimes people think I'm a little strange. ($r = 0.304$, $p < 0.009$).

54. I often find I can't sit still. ($r = 0.285$, $p < 0.014$).

74. I sometimes find that I say one thing and mean just the opposite. ($r = 0.248$, $p < 0.033$).