A CROSS-CULTURAL INVESTIGATION IN SUGGESTIBILITY AND CREATIVE IMAGINATION IN YOUNG ADULTS

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DECLARATION

I, the undersigned, hereby declare that the work contained in this thesis is my own original work, and that I have not previously in its entirety or in part submitted it at any university for a degree.

Signature .................................................. Date ..................................................
ABSTRACT

This research project investigated differences in hypnotic suggestibility between young adults of different ethnic groups, and between male and female subjects. Further, the relationship between creativity and suggestibility in young adults was examined. Therefore, 15 white female, 11 white male and 10 black female students participated in the study. For this research, the Stanford Hypnotic Susceptibility Scale, the Abbreviated Torrance Test for Adults, and a biographical questionnaire on Individual Creative Background were utilized. Analyses of variances and regression were used as statistical procedures in order to analyse the data. From the findings it appears that young black South Africans are more suggestible than white South Africans. Gender differences were found regarding suggestibility, but no significant differences between white and black females. Regarding the outcomes on suggestibility and creativity, it can be concluded from the regression analysis that there is no relationship between suggestibility and creativity in this sample. It can be said that suggestibility cannot predict creativity and vice versa. It appears that young South Africans do not differ in creativity regarding cultural group or gender. Nevertheless, creativity and relationship to the parents in childhood were significantly related. Further, creativity was highly correlated with the amount of time for unstructured playtime in childhood. Reasons for results obtained are discussed and suggestions for future research made.
Hierdie navorsingsprojek het die verskille in hipnotiese suggereerbaarheid tussen volwassenes vanuit verskillende etniese groepe en tussen mans en vroue ondersoek. Die verband tussen kreatiwiteit en suggereerbaarheid in jong volwassenes was ook ondersoek. Vyf en twintig vroue, 15 wit en 10 swart en 11 wit mans het aan die ondersoek deelgeneem. Vir die huidige studie is die Stanford Hypnotic Susceptibility Scale, die Abbreviated Torrance Test vir volwassenes asook ’n biografiese vraelys wat handel oor die individu se kreatiewe agtergrond gebruik. Varianse- en regressie onyledings is as statistiese metodes gebruik oor die data te analiseer. Volgens die resultate wil dit voorkom asof swart Suid Afrikaners meer suggereerbaar is as wit Suid Afrikaners. Beduidende geslagsverskille is gevind ten opsigte van suggereerbaarheid, maar nie ten opsigte van wit en swart vroue nie. Die regressie-analise het geto on dat daar in hierdie studie geen verband tussen suggereerbaarheid en kreatiwiteit bestaan nie. Die aanname dat suggereerbaarheid kreatiwiteit kan voorspel, word in die ondersoek verwerp. Dit wil voorkom asof Suid Afrikaners se kreatiwiteit nie verskil ten opsigte van kulturele groep of geslag nie. Beduidende verband tussen kreatiwiteit en die verhouding met die ouers tydens kinderjare is gevind. Benewens laasgenoemde bevinding is ’n beduidende verband tussen kreatiwiteit en die hoeveelheid tyd wat die kind aan ongestruktureerde, spontane spelaktiviteite deelneem ook gevind. Die redes vir die resultate bevind sal besbruik word en die nodige voorstelle vir toekomstige navorsing sal gemaak word.
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USE OF RACIAL CATEGORISATIONS

The present research rejects the racism implicit in racial categorisation. Yet these categories have a specific reality in the South African context, and their use is therefore necessary. Where this is the case, the following categories are written in lower case letters: black, white, coloured. This is preferred to the regular use of inverted commas, or repetitive use of “so-called” as a prefix.
## CONTENTS

<table>
<thead>
<tr>
<th>Declaration</th>
<th>ii</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>iii</td>
</tr>
<tr>
<td>Opsomming</td>
<td>iv</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>v</td>
</tr>
<tr>
<td>Use of racial categorisations</td>
<td>vi</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>vii</td>
</tr>
<tr>
<td>List of Tables</td>
<td>xi</td>
</tr>
</tbody>
</table>

### CHAPTER 1: INTRODUCTION AND MOTIVATION

1

### CHAPTER 2: QUESTION, AIMS AND HYPOTHESES

6

2.1 Primary aim | 6

2.2 General aims of research | 6

2.3 Hypotheses | 6

### CHAPTER 3: CONCEPTUAL ISSUES, THEORIES, AND EMPIRICAL FINDINGS

8

3.1 Conceptual issues and theory | 8

3.1.1 Hypnosis and hypnotic suggestibility

3.1.1.1 Defining hypnosis, hypnotic suggestibility, and related phenomena | 8

3.1.1.2 Relationship between suggestion and hypnosis | 10

3.1.1.3 Measurement of suggestibility | 11

3.1.1.4 Hypnosis in different frameworks | 12

3.1.1.4.1 The unconscious | 14

3.1.1.4.2 Neodissociation perspective | 15

3.1.1.4.3 Elaboration of Hilgard's neodissociation theory by Kihlstrom | 16

3.1.1.4.4 Hypnosis as psychological regression | 18

3.1.1.4.5 Ego-psychological theory | 20

3.1.1.4.6 Neuropsychophysiologival working model | 22
3.1.1.4.7 Conclusion

3.1.2 Creative imagination

3.1.2.1 Creativity

3.1.2.2 Defining creativity

3.1.2.3 Measurement of creativity

3.1.2.4 Perspectives on creativity

3.1.2.4.1 Product approach

3.1.2.4.2 Process approach

3.1.2.4.3 Person approach

3.1.2.4.4 Press approach

3.1.2.4.5 Conclusion

3.1.2.5 Creativity in different frameworks

3.1.2.5.1 Psychoanalytic theories of creativity

3.1.2.5.2 Psychometric approaches to the study of creativity

3.1.2.5.3 Cognitive approaches to creativity

3.1.2.5.3.1 Primary process cognition as theory of creativity

3.1.2.5.3.2 Defocused attention as theory of creativity

3.1.2.5.3.3 Associative hierarchies as theory of creativity

3.1.2.5.3.4 The intuitive model of creativity

3.1.2.5.3.5 Social-personality approaches

3.1.2.5.3.6 Biological methodologies

3.1.2.5.3.7 Conclusion

3.1.3 Imagination

3.1.4 Linking hypnotic suggestibility and creativity

3.1.4.1 Creative phenomena in the experimental and clinical setting

3.1.4.2 Psychoanalytic theory as link between creativity and hypnosis

3.1.4.3 Conclusion

3.2 Empirical findings
3.2.1 Research on hypnosis 42
  3.2.1.1 Personality correlates of hypnotisability 45
  3.2.1.2 Gender-differences in hypnosis 47
  3.2.1.3 Cross-cultural findings regarding hypnosis 47
  3.2.1.4 Conclusion 48
3.2.2 Research on creativity 48
  3.2.2.1 Variations in creativity 48
    3.2.2.1.1 Personality 49
    3.2.2.1.2 Cognitive processes 49
    3.2.2.1.3 External determinants 50
  3.2.1.2 Cross-cultural research on creativity 51
  3.2.1.3 Gender-differences in creativity 52
  3.2.1.4 Conclusion 52
3.2.3 Research on creativity and hypnosis 55
  3.2.3.1 Relationship at the level of personality 56
  3.2.3.2 Relationship at the level of process 61
  3.2.3.3 Relationship at the level of production 67
  3.2.3.4 Relationship at the level of press 69
  3.2.3.5 Conclusion 70

CHAPTER 4: METHODOLOGY 72
4.1 Permission 72
4.2 Subjects 72
4.3 Research design 72
4.4 Measuring instruments 73
  4.4.1 Stanford Hypnotic Susceptibility Scale 73
  4.4.2 Abbreviated Torrance Test for Adults 74
  4.4.3 Biographical questionnaire 75
4.5 Procedure 76
4.6 Statistical procedures 77

CHAPTER 5: RESULTS 78

CHAPTER 6: DISCUSSION AND RECOMMENDATIONS 83
6.1 Discussion of results 83
6.2 Shortcomings of this study 87
6.3 Recommendations for future research 88

REFERENCES 89
APPENDIX A 101
## LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1</td>
<td>Sample Composition</td>
<td>78</td>
</tr>
<tr>
<td>Table 2</td>
<td>Summary of Means of Suggestibility and Creativity Test Results</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Regarding Gender and Ethnicity</td>
<td>79</td>
</tr>
<tr>
<td>Table 3</td>
<td>ANOVA on Suggestibility and Ethnicity</td>
<td>79</td>
</tr>
<tr>
<td>Table 4</td>
<td>ANOVA on Suggestibility Between White Females and Black Females</td>
<td>80</td>
</tr>
<tr>
<td>Table 5</td>
<td>ANOVA Results on Suggestibility Between White Female and Male Subjects</td>
<td>80</td>
</tr>
<tr>
<td>Table 6</td>
<td>Regression Results for the Relation Between Creativity and Suggestibility</td>
<td>81</td>
</tr>
<tr>
<td>Table 7</td>
<td>ANOVA Results on Ethnicity and Creativity</td>
<td>81</td>
</tr>
<tr>
<td>Table 8</td>
<td>Regression Results for the Relation Between Creativity and Different Items on the Creative Background Questionnaire</td>
<td>81</td>
</tr>
</tbody>
</table>
CHAPTER 1
INTRODUCTION AND MOTIVATION

Different ancient cultures already utilized induced states of altered awareness as healing devices. The ancient Chinese, Egyptians, Greeks, Romans, and others are known to have used such techniques. The Egyptians, for instance, more than 3000 years ago described healing methods similar to modern-day hypnosis (Muses, cited in Gravitz, 1991; Patton, 2004). Another example is the temples of Aesclepiades, known to the Romans and Greeks, where sleep-like states were utilized (Gravitz, 1991; Krippner, 2005).

The origins of hypnosis date from the ancient Egyptian and Greek dream-incubation centres, where hypnotic-like procedures were used. A study of primitive cultures today suggests that hypnotic phenomena possibly played a major role in religion and healing in ancient cultures (Udolf, 1987; Patton, 2004).

Much later, in the 1500s, Hieronymus Nymann underlined the power of imagination on health. Through these insights, the link between bodily function and mental influence started being recognised. In the next century, Johann von Helmont developed the idea that every individual has a natural power based on magnetism. This power, in his view, enabled people to influence each other and promote health (Gravitz, 1991).

In the later history of psychology, the unconscious mental processes were mainly relevant for psychoanalysts. The interest in this field of study was revived twice in the field of academic psychology: Firstly, with the discussion about subliminal perception and learning without awareness (Bob, 2004) and, secondly, with the detection of psychological deficits among medical patients who have undergone cerebral commissurotomy (Gazzaniga, 2002). Nevertheless, there is still uncertainty as to what consciousness exactly is. Therefore, the study of dissociative processes in everyday living and under laboratory conditions is, according to Kihlstrom (1984), very important.

Hypnosis seems to involve divisions in consciousness similar to those associated with the concept of dissociation in mental patients. “Because these alterations in
thought and action can be easily and reliably induced in normal individuals under controlled conditions without any trauma or hazard, the phenomena of hypnosis may serve as convenient laboratory models for the study of basic psychological processes highly relevant to psychopathology” (Kihlstrom, 1984, p. 178f).

The phenomenon of dissociation is also of interest in a cross-cultural perspective. The DSM-IV-TR notes that “dissociative states are a common and accepted expression of cultural activities or religious experience in many societies. Dissociation should not be considered inherently pathological and often does not lead to significant distress, impairment, or help-seeking behaviour” (American Psychiatric Association, 2000).

A review of recent literature on hypnosis shows that there are substantial theoretical disagreements about the nature and explanation of hypnotic phenomena. These theoretical disagreements create difficulties for the development of a definition of hypnosis. According to Wagstaff (1998), the reason for the inability to find a meaningful definition of hypnosis is a result of semantic disagreements about the status of hypnosis as an altered state of consciousness.

Partly due to the problem of finding a proper definition of hypnosis, it is proposed that this field of psychology has largely been disregarded in experimental psychology. Kallio and Revonuso (2003) argue that the “state” versus “non-state” controversy in hypnosis research will continue to remain unresolved as long as there is no generally shared, empirically testable understanding or definition of hypnosis.

Kihlstrom (1984; 2004) urges researchers to take the phenomena of dissociation seriously in order to comprehend it, and to consider the implications for the understanding of the cognitive system. Evolving models of the mind may be deceived if not considering those phenomena. He calls for incorporation of neodissociation theory and related phenomena into larger theories in order to produce a comprehensive view of the mind in order and disorder (Kihlstrom, 1984; 2004).

It has repeatedly been observed that there are individual differences in hypnotic susceptibility. Nonetheless, these documented differences “not only beg for a scientific explanation, but continue to put one experimentalist against another in a
struggle that is far from being resolved” (Dixon & Laurence, 1992, p. 36). This research intends to contribute to the resolution of this controversy and shed light on certain aspects concerning hypnosis and assumed related phenomena.

The same finding that was made for hypnosis research, is also true for investigations on creativity. Guilford (cited in Runco, 2000-2001) called for the initiation of empirical research on creativity in his presidential address to the American Psychological Association. Guilford himself contributed immensely to the study of this field. He developed techniques and tests.

Creativity is relevant on different levels. At an individual level, creativity is important, for instance, when a person is solving problems on the job or in daily life. At a societal level, creativity might enable new scientific findings, new movements in art, new inventions, and new social programmes (Sternberg & Lubart, 1999).

Creative processes are also used in psychotherapy, which makes it important to understand their implications and effects.

Mayer (1999) calls for creativity research in order to “develop a clearer definition of creativity and to use a combination of research methodologies that will move the field from speculation to specification” (p. 459).

The conception of human creativity varies from culture to culture. Societies have constructed many terms to describe activities that are similar to what Western psychologists refer to as creativity (Krippner, 1999). Most indigenous societies do not use or provide for the term “creativity”. However, what would be called creative behaviour or creative products in Western terms, is often apparent in rituals, in the practice of shamans, as well as in the hypnotic-like procedures used in service of the community (Krippner, 2005).

Hence, both phenomena, hypnosis and creativity, are neglected areas in psychology. Nevertheless, the study of hypnosis and creativity might be able to contribute, for instance, to the conceptualisation of unconsciousness. As Meichenbaum and Gilmore (1984) state: “Some concept beyond conscious mental experience is needed to explain behaviour” (p. 293). The authors suggest that an individual's thoughts,
feelings, and actions are informed and influenced by factors that are not consciously represented. Therefore, it is necessary to investigate and understand those processes in greater detail.

*Hypnosis, suggestibility, and creativity* are psychological terms that are understood in different ways by various investigators. Therefore, this study aims to contribute to a better understanding of those phenomena in order to facilitate further research on these important, but neglected areas of psychology.

There has also been a long debate about *culturalism* and *universalism* regarding psychological phenomena in general (Swartz, 1998), and in hypnotic suggestibility (Woodard, 2005) and creativity (Westwood, 2003) in particular. This debate will be addressed in the present research.

Therefore, this research project investigates cross-culturally suggestibility and creativity within the context of hypnosis. In particular the research focuses on the differences between ethnic groups regarding hypnotic suggestibility, as well as possible gender effects related to hypnotic suggestibility.

Investigating cross-cultural research about hypnotic suggestibility and creativity, it appeared that there have only been a few cross-cultural studies done in this context. Furthermore, there was contradictory research done on the “Creative Imagination Scale” (CIS) on an African American sample (Sapp & Hitchcock, 2003). This research attempts to confirm the notion of cross-cultural differences in hypnotic suggestibility and creativity. That study points out the need to explore this field more thoroughly.

Further, in 1997 an estimated 80 percent of black South Africans sought advice from traditional healers (Bodibe & Sodi, 1997). It is assumed that African healers are making use of right-hemispheric activities while dealing with patients. Nowadays, this practice is an important part of the health care domain in South African society (Meyer, Moore, & Viljoen, 1997). Therefore, this practice needs to be controlled since “sangomas”, in the South African context, are highly regarded and play a major role in the health professions. It is known that they make use of forms of hypnosis
besides homeopathic medication. This research could contribute to a better understanding and control of those practices.

The following resolution regarding traditional African forms of healing underline the importance of understanding indigenous practices more in depth in order to facilitate healing and enhance the mental health system:

It is affirmed by this conference that the traditional African worldview and spirituality is highly promotive of mental health as regards its understanding of ubuntu, the high value it places on family life and its deep love and respect of children and the elderly. It is affirmed that the authentic practice of traditional African forms of healing is vital to mental health in Africa, its holistic approach to healing has much value for all to learn. (Bodibe & Sodi, 1997, p. 191)

According to Swartz (1998), Western biomedical culture assumes a split between body and mind. In contrast, it is believed that black people are much more in touch with their organismic side. In the African context, black people believe that their ancestors are in touch with them. Black African cultures seem to be much more metaphysically inclined than Western cultures (Hergenhahn & Olson, 2003). This might be due to some kind of creativity and special understanding of nature. The present research should further contribute to a better insight and appreciation of this fact.

Thus, this study endeavours to aid the research concerned with the underlying mechanisms of both, hypnosis and creativity, by examining and comparing suggestibility, and creativity in different cultural and gender groups.
CHAPTER 2
QUESTION, AIMS AND HYPOTHESES

2.1 Primary aim
Based on the above-mentioned problem areas, the purpose of this study is to examine the relationship between hypnotic suggestibility, creative potential and cultural identity.

2.2 General aims of research
In order to determine if there is a relationship between hypnotic suggestibility, creative imagination, and cultural identity, the following questions need to be addressed.

i. Are there differences in suggestibility between white and black students?

ii. Are there differences in suggestibility between white and black female students?

iii. Are there differences in suggestibility between white female and male students?

iv. Are there differences in creativity between white and black students?

v. Are there differences in creativity between white and black female students?

vi. Are there differences in creativity between white female and male students?

vii. Is there a positive relationship between hypnotic suggestibility and creative imagination in young adults?

viii. Is there a positive relationship between creative imagination and individual creative background?
2.3  Hypotheses
In view of the above-mentioned aims a number of hypotheses have been proposed with the use of one hypnotic suggestibility measure, the Stanford Hypnotic Susceptibility Scale (Kihlstrom, 2003), one measure of creative imagination, the Abbreviated Torrance Test for Adults (McGoff & Torrance, 2002), and one questionnaire about each participant’s individual creative background.

H1:  There are differences in suggestibility between white and black students.
H2:  There are differences in suggestibility between white and black female students.
H3:  There are differences in suggestibility between white male and female students.
H4:  There are differences in creativity between white and black students.
H5:  There are differences in creativity between white and black female students.
H6:  There are differences in creativity between white female and male students.
H7:  There is a positive relationship between suggestibility and creativity in young adults.
H8:  There is a positive relationship between creativity and individual creative background in young adults.
CHAPTER 3
CONCEPTUAL ISSUES, THEORIES, AND EMPIRICAL FINDINGS

3.1 Conceptual issues and theory
The following chapter is concerned with conceptual issues regarding hypnosis and creativity, as well as related theories relevant to this study.

3.1.1 Hypnosis and hypnotic suggestibility
Presently, there exist various different theories on hypnosis in the literature, which are partly overlapping, but also have major dissimilarities. Contradictory and differing viewpoints on the nature of hypnosis and related concepts can be found in the literature (Fromm & Nash, 1991; Lynn & Rhue, 1991).

3.1.1.1 Defining hypnosis, hypnotic suggestibility, and related phenomena
Regarding the disagreement between investigators about the precise nature of hypnosis, it is rather difficult to give a proper definition of this phenomenon. There is the state/non-state debate among investigators, that is whether hypnosis involves a special state, or whether it is about normal awareness that has been modified by suggestions, “demand characteristics”, and other social influences (Krippner, 2005).

Some investigators characterise the hypnotic state as one of a variety of possible altered states of consciousness, while others view it as a state of deep relaxation (Udolf, 1987).

Kihlstrom (cited in Killeen & Nash, 2003), for instance, defines hypnosis as an altered state of consciousness, involving imaginative experiences associated with subjective conviction bordering on delusion and experienced involuntariness bordering on compulsion, which takes place in the context of a particular social interaction between hypnotist and subject, itself embedded in a wider sociocultural matrix of understanding about mind and behavior. (p. 200)

Barber (1991) also describes hypnosis as “an altered state of consciousness in which the individual’s imagination creates vivid reality from suggestion“ (p. 244). Hilgard (1991) views hypnosis as alterations or changes in the total condition or state.
However, he chose to rather speak of a “hypnotic condition” in order to avoid contributing to the state controversy.

Killeen and Nash (2003) summarise that hypnosis is an altered state of consciousness involving imaginative experiences associated with subjective conviction and experienced involuntariness. It takes place in the hypnotic situation, itself embedded in a wider sociocultural matrix of understanding. The process of bringing a subject to this state is called a hypnotic procedure, a name that singles out salient operations within the hypnotic situation. The hypnotic response involves physical movements and subjective reports of them. (p. 223)

Some investigators share the view that hypnosis is a dissociative state in which different mental functions are isolated from each other. This implies the notion that hypnosis may be a physiological phenomenon where brain centres might be involved. Graham (cited in Udolf, 1987), for example, considers hypnosis as a function of the activity of the non-dominant cerebral hemisphere.

A general view on hypnosis today is Bernheim’s notion of hypnosis as a heightened state of suggestibility (Udolf, 1987). Edmonston (1989) has a similar view of hypnosis as “a condition – of relaxation. . . - in which suggestibility is enhanced” (p.75).

Kossak (1993b), for example, uses the terms hypnotic suggestibility and hypnotisability synonymously in his introduction to hypnosis. Udolf (1987), on the other hand, underlines the importance of making a distinction between the two terms. He views suggestibility as “the propensity of a subject to accept and act on suggestions” (Udolf, 1987, p.363), and hypnotisability as “the ability of a subject to be hypnotized,” which “takes into account both basic hypnotic susceptibility and transient motivational factors” (Udolf, 1987, p.357).

Different researchers also debate if suggestibility is a stable trait or not. According to several theorists (Crawford & Gruzelier, 1992; Kossak, 1993a), suggestibility can be seen as stable and, therefore, measurable trait, with perhaps even a hereditary component (Morgan, in Crawford & Gruzelier, 1992). Evans (1991) is of the same opinion as he claims: “Several converging lines of evidence suggest that the
individual differences in the ability to experience hypnosis may reflect one aspect of a more general ability to access, regulate, and alter states of consciousness” (p. 145).

Udolf (1987), in line with trait theorists, defines hypnotic susceptibility or trance capacity as “a personality characteristic that determines a subject’s ability to be hypnotized and to attain a given depth of trance” (Udolf, 1987, p.357). He classifies trance as “an altered state of consciousness rendering a subject hypersuggestible” (Udolf, 1987, p.363).

Various investigators assume a hypnotic response to be affected by contextual, social, psychological, and, for some, biological factors. The relative influence ascribed to each of the factors depends upon the theorist (Nash, 1992).

Having taken the above views on hypnosis and related phenomena into consideration for the purpose of this research, the term suggestibility shall be operationalised as “the propensity of a subject to accept and act on suggestions” (Udolf, 1987, p.363). Suggestibility is operationally defined as susceptibility to hypnotic suggestions, or “the degree to which suggested responses were observed or reported in the specific situation in which the research was conducted” (Kirsch & Council, 1992, p. 267). It will be measured by the Stanford Hypnotic Susceptibility Scale, Form C by Weitzenhoffer and Hilgard (1962), modified by Kihlstrom (2003).

The term hypnotisability is used to delineate suggestibility following the administration of a hypnotic induction (Kirsch & Council, 1992).

Suggestibility has played a major role in the conceptualisations of hypnosis. However, there is not only disagreement about the nature of hypnosis, but also about the delimitation of suggestibility and hypnosis. Some researchers even view the two concepts as the same phenomenon.

3.1.1.2 Relationship between suggestion and hypnosis

According to Edmonston (1989), suggestion has its major effect in the central nervous system. He views suggestion as a central distortion of incoming sensory impulses. Suggestion deceives the senses, but the illusion that it creates is “not a
fallacy of the senses proper, but rather of the intellect, which interprets wrongly what the senses give” (James, cited in Edmonston, 1989, p. 69f).

Eysenck and Furnaux (cited in Kossak, 1993a) distinguished two types of suggestion: Primary and secondary; the former being highly correlated with hypnotisability and consisting of ideo-motor tasks, while the latter is consisting of indirect suggestions whereby the wanted effect is not clear. However, no correlation between indirect suggestion and hypnotisability has been found. On the contrary, ideo-motor tasks like bodily sway, arm rigidity, and hands moving apart, as tests of primary suggestibility were highly correlated with the total Stanford Hypnotic Susceptibility Scale in Eysenck’s and Furnaux’s research. However, other investigators found the opposite. So, the exact nature of the relationship between indirect and direct suggestion and hypnosis is still not comprehended. Yet, it is clear that hypnosis and suggestion are not synonymous terms (Kossak, 1993a).

Edmonston (1989), too, resumes in his article about the relationship between hypnosis and suggestibility:

First, suggestion and hypnosis are not the same thing, but rather that the former (suggestion) is enhanced by the latter (hypnosis); second, that relaxation is the fundamental basis of hypnosis, which, thirdly, can account for both the behavioural and subjective markers of hypnosis and the relationship between suggestion and hypnosis. (p.76)

### 3.1.1.3 Measurement of suggestibility

As found in longitudinal studies, suggestibility is stable over a relatively long period of time, and, hence, can be measured with a standardized test (Kossak, 1993a).

In order to operationalise hypnosis, behavioural scales are typically used to assess hypnotic susceptibility. Researchers measure with these scales to what degree a subject responds to standardized suggestions presented after a standardised hypnotic induction procedure. Most of the scales, thereby, measure overt behaviour as opposed to subjective experiences (Kallio & Revonuso, 2003).

Hypnotic suggestions can, according to Hilgard (cited in Kallio & Revonuso, 2003) be divided into three major categories: Ideo-motor tasks, response-inhibition
suggestions, and cognitive suggestions. “All of these suggestions can be regarded either as aiming to generate mental images of states of affairs that somehow differ from the veridical perception of reality or as altering the experience of information retrieved from long term memory” (Kallio & Revonuso, 2003, p. 116). An ideo-motor response refers to one obtained by a person’s imagination that some motor effect is occurring without consciously or intentionally producing this effect (Udolf, 1987).

Scores on standardised susceptibility scales reach from high to very low, but the majority of individuals react to at least some suggestions. The scores in those tests are categorised into low, medium, and high categories. The individual’s score, then, reflects his or her level of hypnotic suggestibility (Krippner, 2005).

The difficulty in measuring suggestibility is to measure subjective experiences that cannot be observed directly. Therefore, a person who passes certain ideo-motor items in a test of hypnotic susceptibility is considered being suggestible to a certain degree (Kossak, 1993a). Killeen and Nash (2003) argue that “the motor responses of a hypnotised subject provide publicly measurable dependent variables. But there is little that is unique about them. It is the subject’s experience that makes the hypnotic state exceptional” (p. 210).

As can be deduced from this statement, one of the most essential characteristics of hypnosis is viewed to be the subject’s experience of involuntariness or effortlessness. This experience of involuntariness was coined by Weitzenhoffer (1974) as the ‘classical suggestion effect’. The feeling of involuntariness is the central difference between following orders of the hypnotist and real hypnotic behaviour (Kallio & Revonuso, 2003).

The work of Weitzenhoffer and Hilgard led to the standardization of the measurement of hypnotic susceptibility or hypnotisability (Kallio & Revonuso, 2003). One of the scales that is most commonly used at present is “The Stanford Hypnotic Susceptibility Scale, Form C” (Weitzenhoffer & Hilgard, 1962).

3.1.1.4 Hypnosis in different frameworks
Hypnosis has been researched and can be put in different frameworks. Although the diverse schools agree about some fundamental facts and observations that delineate
the domain of hypnosis, there is continuing disagreement about how best to understand phenomena occurring under hypnosis.


Single-factor theories assume that a single process, trait, or mechanism is the basis for hypnotic phenomena. They have in common the assumption that an altered state of consciousness is presumed to explain hypnotic phenomena. Those phenomena are explained through dissociative processes and abilities, psychological regression, or relaxation (Edmonston, 1991), respectively.

Sociocognitive perspectives, on the other hand, focus on social and situational aspects of the hypnotic context combined with a subject’s attitudes, expectations, and beliefs about hypnosis. The emphasis is on the context and the interaction between client and hypnotist. Sarbin, Coe, Barber and Spanos may be viewed as the main investigators who are identified with a social-psychological view of the phenomenon (Lynn & Rhue, 1991).

A third viewpoint on hypnosis deals with interactive-phenomenological theories. This group of theories particularly underlines the interaction of multiple variables during hypnosis. Furthermore, the emphasis is on understanding the subject’s experience. Differences between hypnotic and waking behaviour, and cognitive activity are the focus of research. In addition, a subject’s personality traits, styles, and abilities are viewed as central in facilitating hypnotic experiences (Lynn & Rhue, 1991).

In summary, it can be said that some researchers (Bowers, 1979; Gruzelier, 2005; Hilgard, 1991) argue that hypnotic phenomena can only be explained by presuming a special psychological state such as, altered state of consciousness, trance, or dissociation, while other investigators (Barber, 1991; Coe & Sarbin, 1991; Spanos, 1986) regard hypnotic phenomena as being explainable by using ordinary psychological concepts, such as role-playing or expectations.
Underlying all of the following theories, however, is the notion that conscious experience is at least partly affected by unconscious influences (Bowers & Meichenbaum, 1984). Social-psychological concepts are regarded as important for the hypnotic situation. Nevertheless, for the purpose of this study, the preceding causes of hypnosis are not taken into consideration for the phenomenon that is the result of those causes. Hypnosis is seen as an intrinsic phenomenon influenced, yet not caused by social reality.

3.1.1.4.1 The unconscious

Before going further into the detail of theories about hypnosis, a concept underlying these theories shall be examined further: The unconscious (Gruzelier, 2005).

Bowers (1984) states that “determinants of thought and action that are not noticed or appreciated as such constitute unconscious influences” (p. 228). He elaborates further that there are two modes of unconscious influences: Influences that go unnoticed, and influences that are unappreciated. Furthermore, he claims that awareness is not necessary for the environmental control over behaviour.

Following Lundh’s (cited in Bowers, 1984) view, Bowers proposes that information becomes conscious when it is processed to the level of short-term memory, and it is selectively attended to. Information can enter into short-term memory either through processing of new information to the level of short-term memory, or information from long-term memory must be temporarily transferred into short-term memory before it can become part of one’s conscious experience.

Robinson (1984) defines the unconscious “as a collection of processes that manifest themselves behaviourally but whose contents are unavailable to the otherwise fully conscious actor” (p. 216). According to Robinson, the unconscious includes aspects of information processing in which material otherwise not accessible to consciousness has been registered and stored, but can be retrieved by an observer under appropriate conditions.

In classical psychoanalysis, the general structure of unconscious thought is called primary process. It is organised illogically and serves the pleasure principle and the
id. In contrast, secondary process is organised logically and serves the reality principle and the ego (Fischer & Pipp, 1984).

Primary process has three essential characteristics: condensation, displacement, and wishful, magical, or autistic thinking (Gill; Holt, cited in Fischer & Pipp, 1984). According to Fischer and Pipp (1984), primary process represents a structure of unconscious thought, that develops through cognitive levels. It is characteristic for behaviour in conditions where a gap occurs between the level required by a task and a skill the person uses for the task.

Of particular interest for this study are following theories: The neodissociation perspective, hypnosis as psychological regression, the ego-psychological perspective, and neurophysiological perspectives on hypnosis.

3.1.1.4.2 Neodissociation perspective
This theory is one of the popular contemporary perspectives on hypnosis. Briefly characterized, neodissociation theory applies the concept of dissociation to hypnotic experiences (Hilgard, 1991).

Neodissociation theory assumes that the mental system entails various cognitive structures, which interact, but can also function independently or dissociated from each other (Hilgard, 1973). These structures monitor, organise, and control thought processes and action in different domains. Each structure can seek or avoid inputs and facilitate or inhibit outputs. It is suggested that the cognitive structures are arranged in hierarchical order. At the top of this hierarchy is an “executive ego”, which has planning, monitoring, and managing functions that are required for thoughts and actions involving the whole person (Hilgard, 1991). “As the ultimate end point for all inputs to the system and the ultimate starting point for all outputs, the executive control structure provides the basis for phenomenal awareness and intentionality” (Kihlstrom, 1984, p.189).

According to neodissociation theory, certain conditions can hinder the function of the central executive, disrupting the integration and hierarchical organisation of the subordinate control structures. The communication between two subordinate controls might be cut, for instance, so that each subsystem receives inputs and generates
outputs without integration between the systems. Or the communication between a subordinate control structure and the executive structure might be disturbed, resulting in diminished voluntary control over certain subordinate structures, or a reduction in the normal degree of awareness of what is being processed through them. Either case would represent a state of divided consciousness (Kihlstrom, 1984). “The latter case, in which awareness, and/or actions are perceived as involuntary, is a classic instance of dissociation. When the constraining conditions are reversed, the reversion to the original integrated hierarchical structure will reinstate normal awareness and voluntary control” (Kihlstrom, 1984, p.190).

Under hypnosis the cognitive systems may become independent from each other. Control systems are assumed to be temporarily dissociated from conscious control and are instead directly activated by the hypnotist’s suggestions (Lynn & Rhue, 1991). That is, the hypnotist may directly influence the executive functions and alter the hierarchy of the substructures. Distorted perception and memory or hallucinations may then be perceived as external reality (Hilgard, 1991). Diminished conscious control is responsible for the subject’s feeling of involuntariness (Lynn & Rhue, 1991).

Hilgard discovered in his research that there is a discrepancy between physiological findings and verbal reports of subjects’ behaviours under hypnosis. He interprets these findings as confirmation for his dissociation hypothesis (Kossak, 1993c).

Hilgard's theory can be viewed as similar to aspects of ego regression in Gill and Brenman's (cited in Kossak, 1993c) theory. Through changes in the hierarchy of control structures, the ego gives up its dominance.

Hilgard’s neodissociation theory was further elaborated by Kihlstrom (1984).

### 3.1.1.4.3 Elaboration of Hilgard's neodissociation theory by Kihlstrom

Kihlstrom (1984) assumes that mental activities include subconscious, as well as conscious and unconscious mental processes. He further believes that a person cannot bring unconscious information into phenomenal awareness and control it voluntarily.
Kihlstrom (1984) sees the major problem of a neodissociation theory in explaining how mental activities can carry on apparently involuntary, and outside of phenomenal awareness. He criticizes that this theory allows for activation of various simultaneous schemata organising perception, memory, and action, and thus co-conscious streams of mental activity. However, it still has no room for subconscious streams. Central to the experience of consciousness, then, is linking activated concepts representing perceptions, memories, thoughts, and actions with others representing the self as agent and experiencer on the one hand, and the spatiotemporal context of the event on the other. Those encodings that contain self-referential and contextual features become conscious; those that do not, remain subconscious, regardless of how much processing is allocated to them.

Based on a unistore model of memory, Kihlstrom (1984) argues that all mental activities that are not in the centre of attention can be seen as preconscious, and the perceptual processes themselves are unconscious. All inputs activate corresponding representations in secondary memory and therefore can affect ongoing cognition and action outside of awareness. Further, they can even exert influence without first going through primary awareness.

In the present context, trance logic seems of particular interest because it seems to represent co-consciousness, or a simultaneous representation in awareness of two independent streams of mental activity – the one involved in constructing the hallucinated experience, the other involved in perceiving reality. In all of the other instances of dissociation . . . , one such stream of mental activity is denied to conscious awareness, so that the subject does not become aware of his or her contradictory experiences and actions. The experience of multiple simultaneous, mutually contradictory perceptions can be expected to be rather difficult to maintain; it is not surprising that the phenomenon is rare and has been difficult to tame and bring into the laboratory for rigorous study under controlled conditions. (Kihlstrom, 1984, p. 183)

Kihlstrom (1984) argues that the simultaneous allocation of attentional capacity to two or more tasks results in multiple co-conscious streams of mental activity. Both streams are represented in phenomenal awareness and perceived as voluntary. This
implies that items that are processed in the conscious stream will be associated with each other, but also with concepts representing the self and context. Items processed in the subconscious stream will be associated only with each other. Material processed subconsciously will remain available in the memory system, and even activated, but not accessible to retrieval, as the critical associative pathways have not been formed. Subconscious mental contents are not tied into the episodic memory system, yet, they still can influence ongoing thought and action. Both, conscious and subconscious, streams of mental processing are capable of organizing and executing actions. Even if there is no output channel available to contents being processed subconsciously, the items may still influence ongoing cognitive activity, and, so doing, indirectly affect behaviour.

The subconscious in neodissociation theory differs from psychoanalytic formulations in so far as it is not limited to sexual and aggressive impulses and those memories or ideas associated with them. Nor do subconscious mental processes operate according to “primary process” principles associated with the Freudian unconscious. They rather follow the rational, “secondary process” principles. Kihlstrom (1984) suggests that dissociated perceptions and memories can be closely attached to objective reality. He claims that dissociated ideas can be rational and even creative.

3.1.1.4.4 Hypnosis as psychological regression
Gill and Brenman (cited in Hilgard, 1973; Kossak, 1993c) use the background of ego-psychology based on psychoanalytical theory. According to this view, the ego has autonomous energy sources. Gill and Brenman base their theory of hypnosis on two assumptions. First, they use the psychoanalytical concept of transference. That is, the subject transfers emotions and behaviours experienced in earlier relationships to the hypnotist. This transference is partly regressive, as the patient falls back to earlier emotions and behaviours. The second assumption is “regression in service of the ego” (Nash, 1991). “That is, during hypnosis, the modulated regressive shifts in a subsystem of the ego enables the individual to make use of primary process in the service of creative problem solving and adaptation” (Nash, 1991, p.173).

The two concepts are applied to hypnosis in the following way. As pressure is high in the beginning of the hypnotic session, the regression in service of the ego takes
place during the induction procedure, which causes a fractionation of the ego. As the hypnotic state stabilizes, the ego is restructured at a regressed level (Hilgard, 1973).

At the same time, the subject is motivated to build up transference reactions towards the hypnotist. The subject is caused to focus on autonomous functions. This demands a lot of energy that is taken away from the ego. The ego struggles to cope with other activities, and pressure by the hypnotist causes the subject to gradually give up control (Kossak, 1993c).

While parts of the ego regress more, others still observe the environment and introduce some control (Hilgard, 1973). In this manner, ego subsystems develop that direct their energy against the Id and the Superego. Id-phenomena like hallucinations and memories of previous situations occur (Kossak, 1993c).

Elaborating on Gill and Brenman's notion of hypnosis, Nash (1991) views hypnosis as a special case of psychological regression. This regression, in his view, is characterized by alterations in the experience of self, relationships, and information processing. Hypnotic phenomena are explained by a shift from secondary process to more primary process thinking.

Nash (1991) provides a definition of hypnosis as psychological regression: “Hypnosis is a condition during which a subsystem of the ego undergoes a topographic regression, resulting in changes in the experience of self and others” (p. 175). These changes might include, among others, a shift from secondary to primary processing, an enhanced capacity for regression in service of the ego, and distortions in the experience of the body.

Nash (1991; 1992) assumes from his research that the regression in hypnosis is topographic in nature. That is, hypnosis involves a shift to primary-process mentation – a form of cognition that is described as involving symbolisation, displacement, condensation, nonlogical forms of reasoning, and relative similarity of memory and current experience (Rapaport; Suler; Dudek, cited in Nash, 1992); it is further characterised by a more visual, “holistic” style (Walker, Garrett, & Wallace; Crawford, Wallace, Nomura, & Slater; Wallace, cited in Nash, 1992) The regression takes place only in a subsystem of the ego. Furthermore, the author believes that behavioural,
experiential, and relationship changes under hypnosis are manifestations of a shift in the way a subject processes information. This shift seems to be accompanied by more pre-logical, symbolic, and primary-process mentation, and an enhanced capacity to make use of primary-process material in the service of creativity and adaptation.

Nash (1992) claims that a rich literature assumes a link between imagery and primary process. He also states that these manifestations of topographic regression can be operationalised and reliably measured in clinic and laboratory (Atwood; Bogen; Dixon; Erdelyi; Galin; Marcel; Paivio; Schwartz, Davidson, & Maer; Sperling, cited in Nash, 1992).

3.1.1.4.5 Ego-psychological theory

Fromm (1992) identifies her theory on hypnosis as a cognitive theory based on classical and neoclassical psychoanalysis. She also assumes an underlying altered state of consciousness,

a cognitive-perceptual state different from the waking state. . . . One of its characteristics is involuntarism or nonconscious involvement. . . . An ASC is a state in which the barrier between Freud's unconscious and the conscious becomes more permeable, and in which the individual can make contact with the contents of the unconscious much more easily than in the waking state. (Fromm, 1992, p.132)

Fromm (1992) states that the ego has several different functions, that include perception, cognition, defences, decision making, judgement, memory, attention, imagery, sensations, and affect. The ego organises and structures all the above mentioned functions into conscious and unconscious awareness, in relation to the environment and inner world. In an altered state of consciousness, like hypnosis, subjects maintain the ability to observe, reflect, think, or guide experience. However, a shift towards primary-process mentation with greater ego-receptivity takes place in the hypnotised subject. The relaxation of some vigilance and defences leads to awareness of unconscious thoughts and feelings (Fromm, 1992).
In contrast to Hilgard's (1991) theory, Fromm (1992) assumes a vertical structure of conscious, preconscious, and unconscious awareness as mental states of ascending order. Hilgard, on the other hand, sees divided consciousness as comprising subsystems of cognitive control on the same horizontal level. Fromm interprets the dissociation process as dissociation of the experiencing ego from the observing ego.

Fromm (1991) describes hypnosis as adaptive regression (Hartmann, cited in Fromm, 1991) or regression in service of the ego (Kris, cited in Fromm, 1991). She assumes that hypnotic relaxation leads to an ego-modulated relaxation of defensive barriers with a temporary return to primary-process thinking.

Erika Fromm (cited in Nash, 1992), following Rapaport, identified and applied three modes of ego functioning to hypnosis: Ego passivity, activity, and receptivity. Ego activity under hypnosis is defined “as a volitional mental activity during trance. It can be a decision by the subject not to go along with what the hypnotist is suggesting, or to go along with it because the subject wants to do it” (Fromm, cited in Nash, 1992, p. 134).

Fromm (1991) added Deikman's (cited in Fromm, 1991) concept of ego receptivity to Rapaport's scheme of ego activity and passivity. Ego receptivity is described as a temporary state of involuntarism, diminished critical judgement, and reduced control of internal emotional experiences. Hence, the subject's unconscious and preconscious contents appear freely.

Fromm (1991) suggests regressive shifts in ego functioning during hypnosis from an ego-active to a more ego-receptive mode when the “generalized reality orientation” (Shor, cited in Fromm, 1991) is fading into the background of awareness, which causes the subject to open up towards stimuli from within or from the hypnotist as the only outside source. She underlines the subject's attention and concentration on the hypnotist as well as their special relationship. Goal-directed thinking and adherence to reality orientation are temporarily relinquished. Suggestions, own unconscious and preconscious material, then, floats effortlessly into awareness. Ego receptivity is met in hypnosis primarily as suggestibility (Fromm, 1991).
According to Fromm (1991), ego receptivity in hypnosis can be rendered similar to P.G. Bowers' (cited in Fromm, 1991) conception of effortless experiencing. She has revealed this to be an important feature of heterohypnosis and creativity.

Fromm (1991) assumes that primary and secondary process mentation occur together and range along a continuum and that both are products of the ego. She claims that primary-process thinking is a form of nonverbal imagery, and that healthy primary-process can be observed in the inspirational phase of creativity and in intuitive thought.

Fromm (1991) built into her theory the concepts of attention, absorption, and the general reality orientation (GRO). Attention and absorption are concepts of cognitive psychology, but Fromm claims that they are also ego functions. Absorption (Tellegen & Atkinson; Tellegen, cited in Fromm, 1991) and the fading of the GRO (Shor, cited in Fromm, 1991) have long been recognised as important mechanisms in the context of hypnosis. Absorption is conceived as the result of concentrated attention and ego receptivity.

3.1.1.4.6 Neuropsychophysiological working model

Early studies on neurophysiological concomitants of hypnosis focussed on EEG-correlates of hypnosis (Ulett, Akpinar, & Itil, 1972). Further studies have aimed at finding task related hemisphere specificity with hypnosis. The right, as well as the left hemispheres have been proposed as important mediators for hypnosis. However, recent research suggests that hypnosis might not be a function of only one hemisphere (Crawford & Gruzelier, 1992).

The only neurophysiological model of hypnosis so far has been developed by Crawford and Gruzelier (1992). The researchers assume that the differences in hypnotisability – between high and low hypnotisables and after or without an induction procedure – are partly caused by individual differences in attentional abilities. They further hypothesise that behavioural differences related to hypnotic susceptibility are correlated with and influenced by neurophysiological mechanisms (Crawford & Gruzelier, 1992). It is also assumed that in highly hypnotizable subjects, frontal lobe functions become engaged through instructions to focus attention during the hypnotic induction procedure. This is followed by the inhibition of other frontal
lobe functions such as reflective consciousness, or self-awareness (Kallio & Revonuso, 2003).

No specific observable patterns of neurophysiological changes related to hypnosis have been found so far (Crawford & Gruzelier, 1992). Nevertheless, state theorists claim that evidence for physiological changes exists. Furthermore, those changes can only be explained satisfactorily by using the concept of an altered state of consciousness (Kallio & Revonuso, 2003).

Such a state of altered attention may be focused or diffuse, depending on hypnotic instructions (Hilgard; Sheehan, Donovan, & MacLeod, cited in Crawford & Gruzelier, 1992). As a subject enters hypnosis and becomes gradually more absorbed in the hypnotic experience, a shift in consciousness occurs, away from analytical thinking towards more holistic processing. Decreased reality testing and increased dissociative experiences mark the state of hypnosis. Fromm (cited in Crawford & Gruzelier, 1992) has observed that the “most important structural components of the hypnotic process are imagery and fantasy, absorption, dissociation, and various ego modes and attention postures” (p. 216).

Crawford and Gruzelier (1992) claim that their neurophysiological findings might help to distinguish hypnotically susceptible from unsusceptible subjects in the non-hypnotic state. Crawford (cited in Crawford & Gruzelier, 1992) assumed that highly susceptible subjects exhibit greater cognitive flexibility, are better able to shift their attention and cognitive strategies and to comply with the instructions of the hypnotist. Furthermore, highs are characterised by greater hemispheric specificity (left or right), depending on task demands (Crawford; MecLeod-Morgan & Lack; Mészáros & Bányai, cited in Crawford & Gruzelier, 1992).

Selective cerebral inhibition and activation of some sort seems to occur at different stages of a hypnotic induction. Herbert and David Spiegel (cited in Nash, 1992) hypothesised that an ability to focus attention and maintain concentration is a central physiologically based characteristic of hypnotic capacity.

Crawford and Gruzelier (1992) further argue that in line with their neuropsychophysiological model of hypnosis, which explains “the engagement of
anterior inhibitory functions that extend bilaterally, the left hemisphere is more involved than the right in the first stage of the hypnotic induction process. . . Left-hemispheric advantages in high hypnotizable individuals may be seen to facilitate hypnosis” (Crawford & Gruzelier, 1992, p.263).

The authors report that left-hemispheric frontal advantages were found in highs, whereas lows have been shown the opposite asymmetry. Some other studies showed a hemispheric balance in EEG activation regardless of the task, while highs shift hemispheric activation dependent upon the task. This may clarify the factors that hinder the induction of hypnosis (Crawford & Gruzelier, 1992).

Neurophysiological investigations repeatedly found greater theta power in highs compared to lows in non-hypnotic and hypnotic conditions (Crawford, cited in Crawford & Gruzelier, 1992).

Combined with studies of differential hemispheric specificity and habituation, the evidence strongly supports the view that hypnotic susceptibility reflects an important attentional ability. . . Only when one can focus attention and ignore certain stimuli completely can absorption and the giving up of reality testing, or even responsiveness to hypnotic suggestions, follow. (Crawford & Gruzelier, 1992, p. 265)

The greater mean theta power in high hypnotisables may reflect their “greater efficiency in processing environmental stimuli – the process of disattending and ignoring stimuli requires first the recognition of it and then the decision not to look there. This disattending ability is correlated with greater theta power, a reflection of the fronto-limbic system of attention” (Crawford & Gruzelier, 1992, p.236).

Theta has typically been linked with hypnagogic imagery, meditation, rapid-eye movement sleep, continuous concentration, and selective concentration. High-hypnotizable subjects have been found to be higher in theta than low-hypnotisable subjects (Killeen & Nash, 2003). Killeen and Nash claim that this expresses the ability of highly hypnotisable individuals to narrowly focus attention in order to be relatively free of distractions.
Researchers agree on primary right-hemispheric involvement in a hypnotic trance. However, Crawford and Gruzelier (1992) argue that this right posterior activation may facilitate focal left posterior activation, according to task demands. Hence, the inhibition of anterior frontal lobe functions may be more central to hypnosis.

“Instructions of hypnosis can be seen to trigger a process that alters brain functional organization – a process that at the same time is dependent on individual differences in existing functional dynamics of the central nervous system” (Crawford & Gruzelier, 1992, p. 265).

3.1.1.4.7 Conclusion

None of the diverse theories on hypnosis rejects cognitive and social-psychological processes as potential response determinants. One consensus between the different mentioned theories is that all of them view hypnosis as an intrinsic natural phenomenon that occurs inside a person’s mind when certain conditions are fulfilled.

Hilgard's (1991) neodissociation theory assumes that various cognitive structures communicate with each other with an executive ego on top of the hierarchy. Under hypnosis the cognitive systems may be independent from each other. Control structures seem to be temporarily dissociated from conscious control and are instead directly activated by the hypnotist's suggestions (Lynn & Rhue, 1991).

Hilgard's theory can be seen as similar to aspects of ego regression in Gill and Brenman's (cited in Kossak, 1993c) theory. Through changes in the hierarchy of control structures, the ego gives up its dominance.

Kihlstrom (1984) elaborates on Hilgard's theory by adding subconscious streams to the theory. He also assumes co-conscious streams of mental activity. However, in his view, subconsciously processed items can remain available in the memory system, but are not accessible to retrieval. Yet, subconscious streams of mental processing can organize and execute actions. Subconscious streams follow the secondary process principles (Kihlstrom, 1984).

Nash (1991), in turn, assumes that hypnosis is a special case of psychological regression. This regression is characterised by alterations in the experience of self,
relationship, and information processing. A shift from secondary to primary process thinking takes place.

Fromm (1992) also views hypnosis as involving a shift to primary-process mentation with greater ego-receptivity. She assumes a vertical structure of conscious, preconscious, and unconscious awareness. Hilgard (1991), in contrast, supposes that mental subsystems are arranged horizontally. Fromm (1992) interprets dissociation as dissociation of the experiencing ego from the observing ego. She also assumes hypnosis to be a regression in service of the ego.

Crawford and Gruzelier (1992) apply neurophysiological findings to hypnosis. They assume that attentional ability plays a role in hypnosis, as well as greater cognitive flexibility. Greater theta power and left-hemispheric frontal activation seem to be involved in hypnotic susceptibility.

Hilgard (1973) claims that dissociations in hypnosis belong primarily to conscious cognitive controls. Gill and Brenman's ego psychological interpretation of hypnosis also allows for those dissociations, as there are areas within the ego not motivated by unconscious drives. Therefore, the two theories do not contradict each other.

Weitzenhoffer emphasizes internal processes in the subject, whereas Gill and Brenman use the concept of transference and point to interactional processes; nevertheless, internal processes are still emphasized (Kossak, 1993c).

3.1.2 Creative imagination
What has been viewed as hypnotic suggestibility so far is due to latest research partly imaginative ability and a holistic cognitive style (Sarbin & Coe; Crawford & Allen, cited in Kossak, 1993c). The two controversial opinions on hypnosis both found supportive evidence. That is, the subject's involvement clearly influences suggestibility, and imaginative ability and cognitive style are important factors in hypnosis (Kossak, 1993c). Kossak claims that suggestibility can be described as imaginative ability by means of processing of images. The more vivid those imaginations are, the more a person is rendered suggestible. In this context, creativity seems to play a crucial role.
3.1.2.1 Creativity
Creativity research has a long history in psychology. Research on the causes of individual differences in creativity has been done on personality, cognitive style or ability differences, and social psychology (Heerwagen, 2002).

3.1.2.2 Defining creativity
Defining creativity is challenging as the term is used in many different contexts (Shames & Bowers, 1992). However, most researchers would agree that creativity entails the creation of new ideas. Investigators also concur on two basic features of the creative idea. It must be original, that is, it must be relatively uncommon. It should also exhibit adaptiveness, that is, the idea must give the solution to some significant problem or achieve some important goal (Martindale, 1989; Simonton, 1999). Martindale claims that a creative idea is always a new combination of old ideas, as existing mental elements are put together in a new and creative way.

Vernon (1989), in turn, defines creativity as “a person’s capacity to produce new or original ideas, insights, restructurings, inventions, or artistic objects, which are accepted by experts as being of scientific, aesthetic, social, or technological values” (p.94).

Lumsden (1999) claims that “creativity is a kind of capacity to think up something new that people find significant” (p. 153), while Lubart (1999) states that “creativity from a Western perspective can be defined as the ability to produce work that is novel and appropriate” (p. 339).

In summary, there is some consensus in the creativity research community concerning what to study: Creativity occurs when someone creates an original and useful product. However, there is a lack of consensus on such basic clarifying issues as whether creativity refers to a product, process, or person; whether creativity is personal or social; whether creativity is common or rare; whether creativity is domain-general or domain-specific; and whether creativity is quantitative or qualitative. (Mayer, 1999, p. 451)

According to Udolf (1987), “the solution of problems when the means of solution do not exist but have to be created by the problem solver is an example of creative
behaviour” (p. 150). Problem-solving might be one of several kinds of creativity. This view is confirmed by research that creativity might be a kind of self-actualization or self-expression (Manheim, 1998; Rogers, 1954; Runco, Ebersole, & Mraz, 1991).

For the purpose of this study, it is assumed that creativity is a personal phenomenon, that is, it involves creating something new and useful with regard to the person doing the creating. Creative thought is assumed to be a common aspect of everyday cognition that all humans are capable of doing. Furthermore, it is assumed that creativity is domain-general, and quantitative. In other words, creativity is a general skill that can be applied to a wide variety of situations; and it consists of one or more factors of which people may have in varying quantities. Creativity is viewed as a mental trait that can be quantified by appropriate measurement instruments (Mayer, 1999).

Taking the above views into consideration, the term **creativity** shall be operationalised as originality, fluency, flexibility, and elaboration of responses on a creativity measure (Mayer, 1999). It will be measured by the Abbreviated Torrance Test for Adults (ATTA) by McGoff and Torrance (2002).

3.1.2.3 **Measurement of creativity**

Traditionally, Guilford's 1950 Presidential Address is considered the formal starting date of scientific creativity research, since much earlier attempts failed to produce lasting scientific enquiry (Plucker & Renzulli, 1999).

Torrance (cited in Plucker & Renzulli, 1999) states that “creativity tests tend to be of two types – those that involve cognitive-affective skills such as the Torrance Tests of Creative Thinking. . . and those that attempt to tap a personality syndrome such as the Alpha Biological Inventory” (p. 36).

Creativity tests measure specific cognitive processes such as divergent thinking, making associations, constructing and combining broad categories, and working on many ideas simultaneously. There are also biographical inventories, adjective checklists, and the identification of personal characteristics related to the expression of creativity (Cropley, 2000).
The many different tests exhibit a substantial level of agreement, and scores are internally stable. Tests also correlate with various criteria of creativity, and are useful predictors of creative behaviour in adulthood (Cropley, 2000).

Creative problem-solving is expected to occur when the task is open-ended and allows for originality, according to which divergent-thinking tests, like the Torrance Tests of Creative Thinking (TTCT), were developed. However, they are “useful estimates of the potential for creative thinking, and the emphasis should be on estimates and potential “(Runco & Sakamoto, 1999, p. 84).

3.1.2.4 Perspectives on creativity
Rhodes (cited in Shames & Bowers, 1992) proposed a classification as frame of reference in the study of creativity. He introduces the four categories “product”, “process”, “person”, and “press”.

3.1.2.4.1 Product approach
Investigators who view creativity as a quality of products often focus on case studies of creative production or on computer simulations of creative production (Mayer, 1999).

A product is recognized as creative based on two fundamental attributes: “originality” and “appropriateness” (Amabile, cited in Shames & Bowers, 1992) or “adaptiveness” (Simonton, 1999). Originality can be interpreted in numerous ways. Thurstone (cited in Shames & Bowers, 1992) claims that the product must be novel from the view of the person who created it, regardless if society may not consider it as such. Torrance (cited in Shames & Bowers, 1992), in turn, identifies an original response as determined by its frequency of occurrence in a normative sample. Another necessary criterion for creativity incorporates the notion that a product must be adaptive to the situation in which it was created. Investigators termed this criterion “usefulness”, “quality”, or “appropriateness” (Shames & Bowers, 1992).

3.1.2.4.2 Process approach
Researchers who see creativity as a property of cognitive processing tend to put their focus on studying the phases involved in creative thinking or in teaching creative cognition processing (Mayer, 1999).
A process is considered creative, in contrast to a creative product, without the production of anything of social value. Hence, the subjective experience of creativity must be considered separately from the objective creativity of the product (Shames & Bowers, 1992).

Creativity is rendered a mental process by some investigators that brings about the production of original and adaptive ideas. Cognitive psychologists often use this approach to research problem-solving and insight using either laboratory experiments (Stemberg & Davidson, cited in Simonton, 1992) or computer simulations (Shrager & Langlay, cited in Simonton, 1999). The investigated cognitive operations may include insight, intuition, imagination, and heuristic search (Simonton, 1999).

The creative process involves basically four steps: Preparation, incubation, illumination, and verification (Lubart, 2000-2001). Martindale (1989) adds creative inspiration as a necessary component. According to him, creative inspiration seems to occur in an altered state of consciousness, without the effort of logical, intellectual work.

### 3.1.2.4.3 Person approach

Creativity can also be seen as a trait or personality profile characterising a person (Simonton, 1999). Researchers who view creativity as a property of people have a tendency to focus on individual differences in people’s creativity or on typical characteristics of creative people (Mayer, 1999).

Regarding the creative person, he or she can be distinguished from the normal population by three criteria: achievement, ability, and disposition or attitude (Barron & Harrington, 1981). Psychological theorists have attributed various patterns of personality traits to creative individuals (Isaksen, 1987), and empirical work has produced a number of creative personality scales (Barron & Harrington, 1981). (Shames & Bowers, 1992, p.336)
Davis (cited in Plucker & Renzulli, 1999) found that personality characteristics of creative individuals include awareness of their creativity, originality, independence, risk taking, personal energy, curiosity, humour, attraction to complexity and novelty, artistic sense, open-mindedness, need for privacy, and heightened perception.

### 3.1.2.4.4 Press approach

The last approach to mention is the press approach. “Press” can be understood as the interaction between a situation and an individual. Specific situations can either encourage or inhibit creativity. For an individual, situational variables can have the effect on either an extrinsic motivational orientation, which is hindering creativity, or an intrinsic motivation, in which the satisfaction related to task performance is the crucial motivation (Amabile, cited in Shames & Bowers, 1992).

### 3.1.2.4.5 Conclusion

Creativity can be investigated from each of the above described four levels of description (Shames & Bowers, 1992).

Some researchers combine two or three perspectives in their investigations. Sternberg and Lubart (cited in Simonton, 1999), for instance, examined cross-sectional variations in cognitive style, and then determined if a subject will use the mental operations necessary for the generation of creative ideas.

### 3.1.2.5 Creativity in different frameworks

As Runco and Sakamoto (1999) state: “There is no one model of creativity that accounts for the complicated etiology and diverse expressions of creativity” (p. 80). Hence, five theoretical frameworks have been proposed for the study of creativity: Psychoanalytic, humanistic, cognitive, economic, and evolutionary (Simonton, 1999). Sternberg and Lubart (1999), in turn, introduce six different approaches to understanding creativity: Mystical, psychoanalytic, pragmatic, psychometric, cognitive, and social-personality. In the following discussion, especially cognitive and psychoanalytic theories will be of interest.

#### 3.1.2.5.1 Psychoanalytic theories of creativity

The psychodynamic approach to creativity can be regarded to be the first major twentieth-century approach to the study of creativity. Freud based his approach on
the notion that creativity arises from the constant battle between conscious reality and unconscious drives. He proposed that artists create artistic work as a way to express their unconscious wishes in a publicly acceptable manner (Sternberg & Lubart, 1999).

Later, the concepts of adaptive regression and elaboration were introduced by Kris (cited in Sternberg & Lubart, 1999) to the study of creativity. “Adaptive regression, the primary process, refers to the intrusion of unmodulated thoughts in consciousness. Unmodulated thoughts can occur during active problem solving, but often occur during sleep, intoxication from drugs, fantasies or daydreams, or psychoses. Elaboration, the secondary process, refers to the reworking and transformation of primary process material through reality-oriented, ego-controlled thinking” (Sternberg & Lubart, 1999, p. 6). Recent work has acknowledged the importance of both types of thinking (Werner & Kaplan, cited in Sternberg & Lubart, 1999).

3.1.2.5.2 Psychometric approaches to the study of creativity
Guilford (cited in Sternberg & Lubart, 1999) proposed not only to focus on creative geniuses, as the psychoanalytic approach did. He suggested that creativity could also be studied with a psychometric approach to everyday people. Hence, his divergent thinking tasks became popular for measuring creative thinking. Building on Guilford’s notion, Torrance developed the Torrance Tests of Creative Thinking (TTCT).

3.1.2.5.3 Cognitive approaches to creativity
Researchers also investigate the mental representations and processes producing creative thought. Therefore, studies have been done on humans, as well as computer simulations (Boden, 1999).

Finke, Ward, and Smith (cited in Sternberg & Lubart, 1999) have proposed their Geneplore model. According to that model, there are two main processing phases in creative mentation: A generative phase and an exploratory phase. In the generative phase, a person constructs mental representations referred to as preinventive structures, which have properties supporting creative findings. In the exploratory phase, these properties are used to develop creative ideas. Therefore, mental
processes like retrieval, association, synthesis, transformation, analogical transfer, and categorical reduction may be part of creative invention (Sternberg & Lubart, 1999).

3.1.2.5.3.1 Primary process cognition as theory of creativity

Kris (cited in Martindale, 1999) proposed that creative individuals are better able to shift between primary process and secondary process modes of thinking than uncreative individuals. The primary-secondary process continuum is assumed by Fromm (cited in Martindale, 1999) to be the main dimension along which cognition changes. Primary process can be detected in normal states such as dreams, as well as in deviant states such as psychosis and hypnosis. It can be characterised as autistic, free-associative, analogical, and involving concrete images as opposed to abstract concepts. Secondary process thought can be described as abstract, logical, reality-oriented thought of waking consciousness (Martindale, 1999).

According to Kris (cited in Martindale, 1999), creative inspiration includes a regression to a primary process state of consciousness. This state presumably facilitates the discovery of new combinations of mental elements. Creative elaboration, in turn, is marked by a return to secondary process thought. Uncreative people are assumed to be caught at one point in the primary-secondary process continuum. Hence, they are not able to develop creative ideas. Martindale quotes several lines of research as evidence for this theory, including that creative people are found to be more easily hypnotised than uncreative people (Lynn & Rhue, 1986). Wild (cited in Martindale, 1999) found evidence that highly creative individuals are better able to shift between use of primary process and secondary process cognition.

3.1.2.5.3.2 Defocused attention as theory of creativity

Differences in creativity might also be based on focus of attention (Mendelsohn, cited in Martindale, 1999). In order to become aware of a creative idea, a person must put the elements to be combined in the focus of attention simultaneously. Hence, the greater the attentional capacity, the more likely a person is to develop creative ideas. If a person is only able to attend to two mental elements at the same time, only one association is likely to occur. There is evidence that uncreative people have more narrowly focused attention than do creative individuals (Dykes & McGhie, cited in Martindale, 1999).
3.1.2.5.3.3 Associative hierarchies as theory of creativity
Mental elements are linked with each other in various degrees. People are likely to give certain responses to certain stimuli. Therefore, an associative hierarchy for a certain stimulus may be developed. People vary in the steepness of their associative hierarchies. An individual with a steep hierarchy will only be able to give a few responses to a certain stimulus. A person with a flat associative hierarchy, in turn, has more associations to a stimulus. The close associations are less strongly bonded to the stimulus; hence the remote associations are more strongly tied to the stimulus than for people with steep associative hierarchies. Mednick (cited in Martindale, 1999) proposed that creative people have flat associative hierarchies, which enables them to make remote associations, the basis of creative ideas (Martindale, 1999).

However, according to Mednick (cited in Martindale, 1999), the arrangement of mental elements on associative hierarchies is similar for creative and uncreative people, but the strength of the responses differs.

Martindale (1999) summarises that the above mentioned theories are almost identical. Defocused attention and flat associative hierarchies are cognitive and behaviouristic ways of describing the same phenomenon.

3.1.2.5.3.4 The intuitive model of creativity
Bowers (1984) defines intuition as “sensitivity and responsiveness to information that is not consciously represented, but which nevertheless guides inquiry toward productive and sometimes profound insight” (p. 256).

Bowers (1984) advocates the intuitive model of creativity. By this model, total immersion of a scientist or an artist in his field seems to be an important prerequisite of genuine creativity in his or her specific discipline. Nevertheless, this same condition might also be limiting for possible insight. The alert and focused mind is preoccupied with expectations of what is likely. Such expectations may often be misleading (Nisbett & Ross, cited in Bowers, 1984). A genuine creative insight, in contrast, is unexpected and improbable (Getzels & Jackson, cited in Bowers, 1984). When not consciously searching for a solution, relatively unlikely associations of available ideas, information, and images might connect, not impaired by conscious
goals, expectations, and strategies of problem solving (Spence & Holland; Koestler; Rugg; Arieti, cited in Bowers, 1984).

Bowers (1984) explains creative insight as association of previously unconnected ideas that a person has already had; a process termed bisociation (Koestler, cited in Bowers, 1984). This bisociation is possible because those ideas “are embedded in and reflect an emerging coherence that is tacitly perceived prior to becoming fully conscious” (Bowers, 1984, p.262). “The implication of these findings is that people can have a presentiment of coherence before they can explicitly identify the basis for it. Moreover, even prior to its being explicitly noticed and identified, perceived coherence seems to guide thought and action tacitly” (Bowers, 1984, p.262).

Sudden insight in the creative process is, according to Bowers (1984), an example of the productive impact on consciousness which the unconscious thought might have.

3.1.2.5.3.5 Social-personality approaches
Research following social-personality approaches has focused on personality, motivational, and sociocultural variables as foundations of creativity. Investigators such as Amabile, Eysenck, or MacKinnon have noticed that personality traits can be linked to creative individuals. These traits include independence of judgement, self-confidence, attraction to complexity, aesthetic orientation, and risk taking (Sternberg & Lubart, 1999). Approaches concerning self-actualization and creativity (supported by, for instances, Rogers and Maslow) also fall into this area.

Motivation has been a focus of research within this approach. Intrinsic motivation is considered to be particularly important for creativity (Collins & Amabile, 1999). Another area of attention within this approach is the social environment. Simonton (cited in Sternberg & Lubart, 1999), for instance, has been concerned with the societal level concerning differences in creativity. Cross-cultural comparisons by Lubart (1990) and anthropological studies (Silver, 1979) have demonstrated cultural diversity in creativity.

3.1.2.5.3.6 Biological methodologies
The biological approach investigates brain activities of people engaging in creative thinking. To sum up, “creative inspiration occurs in a mental state where attention is
defocused, thought is associative, and a large number of mental representations are simultaneously activated” (Martindale, 1999, p. 149). This is indicated by “low levels of cortical activation, comparatively more right- than left-hemisphere activation, and low levels of frontal-lobe activation” (Martindale, 1999, p. 149). Martindale states that creative individuals do not show all of the traits enabling creativity. They only exhibit them while engaged in creative activity. Martindale mentions, for instance, that “creative people are characterized by a lack of both cognitive and behavioural inhibition” (p. 143), which is indicated by lower levels of frontal-lobe activation in creative individuals as opposed to uncreative people engaged in creative activities.

3.1.2.5.3.7 Conclusion
Psychoanalytic theories assume adaptive regression and elaboration to be the key elements of a creative process. Secondary process is assumed to occur in the elaboration phase (Sternberg & Lubart, 1999).

Kris (cited in Martindale, 1999) assumes that creative individuals are better able to shift between primary and secondary process cognition. He further assumes a regression to a primary process mode of cognition for inspiration to occur, in order to discover new combinations of mental elements.

Greater attentional capacity in order to attend to many mental elements simultaneously is also assumed to be necessary to become aware of creative ideas (Dykes & McGhie, cited in Martindale, 1999). A flat associative hierarchy in order to make remote associations is another concept assumed to be the cause of creativity (Mednick, cited in Martindale, 1999). Martindale summarises that the above mentioned theories are almost identical. Defocused attention and flat associative hierarchies are cognitive and behaviouristic ways of describing the same phenomenon.

Bowers' (1984) intuitive model of creativity assumes total immersion of an individual to be a prerequisite for creativity. Previously unconnected ideas are associated with each other, so that unconscious ideas guide thought and behaviour.

Social-personality theories view traits such as attraction to complexity, or aesthetic orientation (Sternberg & Lubart, 1999), motivational factors (Collins & Amabile,
1999), as well as social environment (Simonton, cited in Sternberg & Lubart, 1999) to be important in the creative process. Cultural factors influencing creativity are also considered within this framework (Lubart, 1990; Silver, 1979).

Regarding biological approaches, low levels of cortical arousal, more right-hemisphere activation, as well as low levels of frontal lobe activation are associated with creativity. This is indicative of defocused attention, associative thought, and simultaneous activation of a large number of mental representations (Martindale, 1999).

Martindale (1989) resumes the above mentioned approaches to research on creativity as follows:

Creativity consists of combining previously unrelated mental elements in a new and useful fashion. In order to do this, it is necessary that a person has a large stock of such elements drawn from diverse domains. Intelligence does not interfere with the acquisition of these elements, but, without the presence of certain motivational factors, they will not be learned or remembered in the first place. Purely intellectual or secondary process thought does not seem to produce creative ideas. Rather, a person must have access to an opposite primary process type of cognition that is marked by defocused attention and associative, undirected thinking. At cognitive and neural levels, primary process thought may be explained as involving disinhibition. It would appear that access to primary process thought can only occur within a matrix of personality traits many of which also involve disinhibition. Creativity, then, seems to be a general personalogical trait rather than an isolated cognitive skill. (p. 228)

3.1.3 Imagination

Imagination is a special feature or form of human thought characterized by the ability of the individual to reproduce images or concepts originally derived from the basic senses but now reflected in one’s consciousness as memories, fantasies, or future plans. These sensory-derived images (“pictures in the mind’s eye”, mental conversations, or remembered or anticipated smells, touches, tastes, or movements) can be reshaped and recombined into new images or possible future dialogues that may range all the way from regretful ruminations (“If I only had said or done it
differently”) to rehearsals or practical planning for upcoming job interviews or other social interactions and, in some cases, to the production of creative works of art, literature, or science. (Singer, 1999, p.14)

Edmonston (1989) states that imagination is the internal representation of sense perceptions past, present, and future.

It is the central nervous system’s template of sensory sensation, which is not present at the time of imagination, of internal images, sans their appropriate external stimuli. Imagination, then, is the result of deception, either from within, as in a self-initiated fantasy, or from without, as in suggestions from outside the self. (Edmonston, 1989, p. 69)

The current view of imagination in psychology is that it is a central feature of human cognition and information processing. It seems to reflect a key aspect of human conscious experience. Conscious information processing involves representations of stimuli and environmental events. When such representations are saved, they may be retrieved intentionally, or may return spontaneously as daydreams, fantasies, or night dreams. Under proper conditions, such long-term memory material can be the source for creative products (Singer, 1999).

Regarding hypnosis and imagination, “hypnotic trance” is assumed to be the result of imaginative processes. A hypnotised individual constructs mental images that may have little or no connection to information about reality perceived by a person’s senses (Krippner, 2005).

3.1.4 Linking hypnotic suggestibility and creativity
Shames and Bowers (1992) state that if hypnosis and creativity are related constructs, the relationship must be evident on at least one of the following levels.

1. Subjects who are highly responsive to hypnosis would share certain personality traits with highly creative people, and there would be a significant correlation between hypnotisability and personality measures of creativity.
2. There would be observable similarities in the subjective experience described by hypnotised subjects and by individuals engaged in the creative process.

3. Hypnotized subjects would generate a more creative product in response to a specific task than would nonhypnotised subjects.

4. Specific situational variables that characterise hypnotic settings would be shown to facilitate creativity. (Shames & Bowers, 1992, p.336)

According to Shames and Bowers (1992), the link between creativity and hypnosis has both an observed and a theoretical foundation. They claim that in clinical and experimental settings, hypnotic phenomena that have creative characteristics can be observed. Psychoanalytic theory offers a theoretical link between the two phenomena (Shames & Bowers, 1992).

3.1.4.1 Creative phenomena in the experimental and clinical setting

Investigators frequently make use of the Standford Hypnotic Susceptibility Scale, Form C (Weitzenhoffer & Hilgard, 1962). In their settings they repeatedly find indications that the subject has creatively elaborated on the given suggestions for the age regression, dream, and auditory hallucination items (Shames & Bowers, 1992).

Shames and Bowers (1992), for instance, quote an incident in Kihlstrom's laboratory, where a subject elaborated on the dream suggestion. She states: “I saw a hill which turned into a spiral. The spiral was going into someone's head who was lying down. Then the person started spinning around and the room spun faster and faster until it all disappeared.” Shames and Bowers claim that this description fulfils both criteria for a creative product: it is an original imagination, as well as appropriate to the given task.

The creation of pseudomemories in the context of hypnosis also falls into this realm. Any elaboration a subject provides regarding a given suggestion can be rendered creative, as the person has gone beyond the mere suggestion (Shames & Bowers, 1992). This viewpoint is criticized, as confabulation can also be interpreted as a failed response of the subject, because the subject was supposed to provide accurate memory (Dywan & Bowers, cited in Shames & Bowers, 1992). An alternative perspective would be that those responses can be viewed appropriate if they are
adaptive to the needs of the subject, for example if the answer draws attention to the nature of a subject's problems (Shames & Bowers).

3.1.4.2 Psychoanalytic theory as link between creativity and hypnosis

Freud (cited in Shames & Bowers, 1992) introduced a topographic model of the mind with three mental systems, namely Cs, Pcs, and Ucs. The Cs system (conscious mind) contains thoughts, feelings, and impulses of which a person is presently aware. The contents of the Pcs are currently outside of awareness, but can be brought into awareness by turning attention to them. The contents of the Ucs, in turn, cannot be brought into awareness by turning attention to them.

In his model, Freud introduces the term “regression” to describe a person's shift from logical and reality-bound secondary-process thinking, to more prelogical, drive-dominated primary-process thinking, which can be seen in dreams, for example. Kris (cited in Shames & Bowers, 1992) elaborated on this idea and proposed the notion of “regression in service of the ego”, which is a type of regression that the ego initiates and terminates for its own benefit rather than for defensive purposes. In this context, creativity is termed an “adaptive regression”, as it "represents a healthy, constructive letting go, accompanied by an increase in primary-process thinking" (Shames & Bowers, 1992, p. 339).

Hypnosis became first associated with adaptive regression in Gill and Brenman's (cited in Shames & Bowers, 1992) theory. In this theory, the individual's overall ego gives up control to the hypnotist during a hypnotic induction, and a regressive restructuring takes place.

"Adaptive regression provides a theoretical link between creativity and hypnosis, but it also draws an important distinction between the two processes. Although the regressive aspect is similar in both, only creativity implies any constructive use of the regressive experience. In the hypnotic state, there is increased primary process, but control of it as shown in adaptive-regression scores may not increase" (Shames & Bowers, 1992, p. 340).

Data from several studies show that highly hypnotizable individuals tend to score higher on various measures of creativity (P.G. Bowers; P.G. Bowers & K.S. Bowers,
cited in Ashton & McDonald, 1985). The reason for this finding is believed to lie in their ability to engage in non-hypnotic trancelike experiences, to suspend critical judgment, and to demonstrate absorption in fantasy or imaginative activities (Ashton & McDonald, 1985).

In a study by Ashton and McDonald (1985), hypnotic procedures were not effective in enhancing creative performance. These findings are inconsistent with those of Gur and Reyher (cited in Ashton & McDonald, 1985). According to Ashton and McDonald (1985), this can be interpreted as support for the indirect link between hypnosis and creativity by the way of hypnotisability. That is, they tried “to link the similarities between the trait characteristics associated with hypnotic susceptibility and the cognitive processes involved in creative productions” (Ashton & McDonald, 1985, p.15).

Krippner (1990), in a different approach, tries to link creativity and hypnosis as follows:

Altered states of consciousness, such as those induced by hypnosis. . . , may assist in fostering the creative act because creativity is basically preverbal and unconscious in origin. Torrance (1962) has recognized the preverbal origins of creativity, defining it as the proves of sensing gaps or missing elements, forming ideas or hypotheses about them, testing the hypotheses, and communicating the results. (Krippner, 1990, p.325)

Krippner (1990) assumes that hypnotic induction could help to get to the preverbal realm, where some types of creative inspiration have their origins.

Krippner (1990) further claims that absorption of the client in the cues provided by the hypnotist enables the subject only to be focused on relevant stimuli. “This phenomenon resembles the fusion of subject and artist reported by many creative artists. This fading of boundaries between the self on the one hand and the outer environment on the other hand facilitates hypnotic experience, as well as creative activity” (Krippner, 1990, p.334).
3.1.4.3 Conclusion

Creative phenomena can be observed in experimental and clinical settings using hypnosis. Patients often elaborate creatively on hypnotic suggestions. Psychoanalytic theories provide a theoretical link between creativity and hypnosis. Adaptive regression is rendered important for creativity to occur, as well as for hypnotic phenomena. The regressive aspects seem to be similar in both processes. However, only creativity implies constructive use of the regressive experience. In hypnosis, primary process is controlled (Shames & Bowers, 1992).

Highly hypnotizable individuals are found to score higher on various creativity measures. They are believed to be able to engage in non-hypnotic trancelike experiences, to suspend critical judgement, and to demonstrate absorption in fantasy or imaginative activities (Ashton & McDonald, 1985). Ashton and McDonald assume an indirect link between hypnosis and creativity by the way of hypnotisability. That is, they link the similarities between trait characteristics related to hypnotic susceptibility and cognitive processes involved in creative production.

Krippner (1990) links the two concepts by assuming altered states of consciousness, such as hypnosis, to enhance creativity, as it is basically preverbal and unconscious in origin. Hypnosis might help to get to those preverbal realms. Further, absorption might be a link, as in hypnosis and in creativity the boundaries between self and environment facilitate hypnotic experiences as well as creative activity (Krippner, 1990).

3.2 Empirical findings

3.2.1 Research on hypnosis

Hilgard's neodissociation theory generated more interest among researchers in the related phenomena of absorption, imaginative involvement, and fantasy proneness. A large number of investigations suggest that dissociation is the core feature of hypnosis (Nash, 1992).

Hilgard (1973) repeatedly found evidence that cold pressure pain is reduced through hypnotically suggested analgesia or anaesthesia. This suggestion results in marked reduction in felt pain, while commonly no changes in physiological indicators of pain are registered. Changes in heart rate and blood pressure the same as when the pain
stimulus was perceived in the waking state. However, the subject seems to feel no pain after suggestion of analgesia or anaesthesia, indicated by hypnotically induced automatic writing or similar procedures. Hilgard (1991) proposed his concept of the “hidden observer” as possible explanation for this phenomenon. According to Kihlstrom (1984), the hidden observer phenomenon is a prime example of dissociative processes at work.

The relationship between hypnotisability and reduced pain perception following hypnotically suggested analgesia is reported to be about .50 (E.R. Hilgard & Hilgard, cited in Crawford & Gruzelier, 1992).

Moore (2002) found in a study on childhood maltreatment, dissociation, and hemispheric organisation that dissociation might be related to hypnotisability in terms of hemispheric organisation.

Hilgard (1991) mentions studies on developmental aspects of hypnosis. A study on twins and their families done by Morgan (cited in Hilgard, 1991) suggests that at least a component of hypnosis seems to be inherited, as he found higher correlations between identical twins than between fraternal twins.

Evans (1991) describes an experiment about the relationship between randomisation and hypnotisability. For this investigation, a measure of cognitive flexibility and attentive effort was utilized. Subjects were asked to freely associate numbers. In these studies, Evans and his colleagues found that highly hypnotisable subjects performed better on this task than relatively unhypnotisable subjects. He claims that “These studies are significant in providing documentation that dissociative processes are related to cognitive and attentional functioning” (Evans, 1991, p. 154).

Research further indicates that high-hypnotisable subjects report more primary-process mentation in hypnotic dreams than high-hypnotisables instructed to remain alert and thinking and imagine along with suggestions. Differences in primary process could not be detected for hidden-observer suggestions. This finding supports the psychoanalytic model of hypnosis, as differences in primary process were evident in response to the dream but not the hidden-observer suggestion (Pinnell, Lynn, & Pinnell, 1998).
“So far, most studies of hypnosis, including most physiological studies, have concentrated entirely on the identification of state differences, and have failed to take adequate account of subject differences which might be critically important to the experimental phenomena” (London, Hart, Leibovitz, & McDevitt, 1969, p. 151).

Crawford and Gruzelier (1992) state that many different studies could show that those subjects who have the ability to refocus attention and shift cognitive strategies when given a hypnotic induction are generally also capable of vivid imagery, holistic thinking, extremely focused and sustained attention, and absorption in imaginative activities during nonhypnotic conditions (Crawford, cited in Crawford & Gruzelier, 1992). In addition, it was found that high hypnotisable individuals are also capable of ignoring task-irrelevant environmental stimuli (Crawford; Crawford, Brown, & Moon; B. Wallace; B. Wallace & Patterson, cited in Crawford & Gruzelier, 1992). Theses individuals also demonstrate greater “cognitive flexibility”, an ability to shift from one strategy to another and from one alternate state of awareness to another (Crawford; Crawford & Allen, cited in Crawford & Gruzelier, 1991).

An imbalance of function favouring the right hemisphere was found in low hypnotizable subjects during nonhypnotic baseline conditions, and during hypnosis induction (Gruzelier & Warren, cited in Crawford & Gruzelier, 1992), together with retarded habituation of electrophysiological responses (Gruzelier & Brow; Gruzelier, cited in Crawford & Gruzelier, 1992), which indicates possible anxiety and/or generalised, nonfocused attentional processing in lows. This anxiety and this type of processing is presumed to counteract hypnotic induction.

Research shows that highly hypnotisable subjects in general prefer the right hemisphere (McCollom, cited in Kossak, 1993a), which was refuted by Monteiro und Zimbardo (cited in Kossak, 1993a). Nevertheless, cerebral laterality is proven insofar that hypnotic inductions seem to arouse more automatic activity in the left side of the body (Graham & Evans, cited in Kossak, 1993a). Furthermore, in highly suggestible individuals the cortical activity shifts from the left to the right hemisphere at the beginning of hypnotic induction (MacLeod-Morgan, & Lack; Meszaros, & Crawford; Crawford, cited in Kossak, 1993a).
Regarding pain experiments, Crawford and Gruzelier (1992) argue that highs are able to reduce or eliminate the perception of pain after hypnotically suggested analgesia and anaesthesia, which can be understood as an example of inattention to pain and the redirection of attention elsewhere. A shift in theta power dominance from the left to the right hemisphere can be found when highly hypnotisable subjects shift their attention away from the painful stimulus (Crawford, cited in Crawford & Gruzelier, 1992). “Thus, the ability to disattend to irrelevant stimuli (to habituate) provides a major clue as to what contributes to the development of dissociative behavior” (Crawford & Gruzelier, 1992, p. 265).

3.2.1.1 Personality correlates of hypnotizability

Research about factors that might be related to suggestibility has also been done in the field of personality psychology. Defining personality as including every factor within an individual that affects behaviour, Udolf (1987) sees hypnotic susceptibility as an aspect of personality. He cites several studies linking a variety of personality aspects to the hypnotic phenomenon. A positive relationship, for example, was found between susceptibility and the ability to become absorbed in a task or fantasy. Further, Udolf assumes that self-centered, dependent, or impressionable persons might be likely to be good subjects. Other researchers, like Kossak (1993a), find no connection between personality variables and suggestibility. He claims that hypnotisability is not related to personality. Research on personality correlates of hypnotic suggestibility has, among others, focused on absorption, imaginative involvement, and fantasy proneness. These constructs are so closely related that it is unclear if they represent different concepts. However, the above mentioned constructs are of interest to hypnosis researchers as they represent a point of convergence between contrasting hypnosis theories (J.R. Hilgard; S.C. Wilson & Barber, cited in Kirsch & Council, 1992). Furthermore, research on the said constructs has delivered replicable correlations with hypnotisability (Kirsch & Council, 1992).

“Absorption can be defined as a predisposition or openness to experience, alterations of cognition and emotion over a broad range of situations” (Roche & McConkey, cited in Kirsch and Council, 1992, p. 269).
“The association of hypnotic responsiveness with absorption made sense from virtually all theoretical perspectives, and provided a rare consensus among hypnosis theorists (Spanos & Barber, 1974)” (Kirsch & Council, 1992, p. 270). However, context effects seem to diminish the validity of the relation between absorption and hypnotisability (Kirsch & Council, 1992).

Tellegen and Atkinson (cited in Kirsch & Council, 1992) developed a questionnaire – the Tellegen Absorption Scale – that has become the most widely used measure of absorption. In several studies, the TAS has significantly predicted hypnotic responsiveness (Council & Huff; Crawford; Nadon, Laurence, & Perry; Tellegen & Atkinson, cited in Kirsch & Council, 1992).

However, correlations between the TAS and hypnotic susceptibility scales have been modest. Generally, studies using scales that comprise of more difficult cognitive suggestions – like the SHSS:C – have produced higher correlations than those utilizing scales with easier, ideomotor items (Kirsch & Council, 1992).

J.R. Hilgard (cited in Kirsch & Council, 1992) defined “imaginative involvement” as an almost total immersion in an activity, together with disattention to irrelevant stimuli. She assumed imaginative involvement to be a core feature of hypnotic responding. However, context effects might also have played a major role in this finding (Kirsch & Council, 1992).

Wilson & Barber (cited in Kirsch & Council, 1992) reported that the “fantasy-prone” personality can be characterised as being deeply involved in a private world of fantasy, vivid daydreams, and seemingly paranormal experiences. A moderate correlation between hypnotisability and fantasy proneness was reported (Kirsch & Council, 1992).

Barber and Wilson (cited in Kirsch & Council, 1992) identified in their research some correlates to hypnotisability, which seem to enhance a subject’s capacity to respond to hypnotic suggestion. They called these correlates the “Fantasy Prone Personality” (FPP). FPP does not seem to be a distinctive personality type, but it characterises a group of imaginative and visionary individuals. Josephine Hilgard (cited in Kirsch &
Council, 1992) also found similar results in her studies on hypnosis. She found that some individuals have especially rich inner fantasy lives and vivid imagery.

Children's suggestibility is said to be linked to several personality factors. Bruck and Melnyk (2004) reviewed 69 studies examining the relationship of demographic factors, cognitive factors, psycho-social factors and children's suggestibility. For cognitive factors, language ability and creativity were consistently found to be related. For psycho-social factors, measures of self-concept/self-efficacy, maternal attachment, and parent-child relationship were highly correlated with suggestibility.

3.2.1.2 Gender-differences in hypnosis

Factors that might be linked to hypnotic suggestibility are, furthermore, age, gender, nationality, and cultural differences. Udolf (1987) claims that females seem to be slightly more suggestible than males.

Bowers (1971) found in a study on 36 male and 36 female undergraduate students that hypnotic susceptibility, creativity, and spontaneous trance-like experiences were related only for female participants. Furthermore, only women exhibited increase in these correlations as a function of susceptibility level. Bowers concludes that gender seems function as a moderator variable in the correlates of hypnotic susceptibility. Furthermore, he found women to be superior on a susceptibility scale that included more items requiring profound distortions in perception. Bowers concludes that the gender differences stem from basic differences in the organization of imagination. He further suggests that women's imagination is more stimulus incited, while men's imagination is more impulse driven.

3.2.1.3 Cross-cultural findings regarding hypnosis

Udolf (1987) argues that people from torrid climates tend to be good subjects, as they are probably more experienced in relaxation techniques, but no evidence exists for that notion. He further assumes that, theoretically, there should be a higher percentage of good subjects among Asians and Indians than among Western Europeans based on cultural differences regarding the prevalence of types of meditative practices (Udolf, 1987).
3.2.1.4 Conclusion

Regarding personality correlates of hypnotisability, absorption, imaginative involvement, and fantasy proneness are assumed to be related to hypnotic susceptibility (Kirsch & Council, 1992).

Another field of study found language ability and creativity to be related to hypnotisability. Measures of self-concept/self-efficacy, maternal attachment, and parent-child relationship were found to be highly correlated with suggestibility (Bruck & Melnick, 2004).

Gender seems to function as moderator variable regarding hypnotic susceptibility (Bowers, 1971). Bowers (1971) claims that gender differences in suggestibility can be attributed to differences in the organisation of imagination.

Regarding cross-cultural findings on hypnosis, Udolf (1987) assumes that subjects from torrid climates experienced in meditative practices tend to be easier hypnotized.

3.2.2 Research on creativity

3.2.2.1 Variations in creativity

Research on creativity has especially focussed on potential causes for individual differences in creative production. The field has been examined from the perspective of personality differences, cognitive style or ability differences, and social psychology.

Heerwagen (2002) states that cognitive processes involved in creativity are the same for everyone. However, some people are more creative than others. There are individual as well as situational differences that influence creativity. These differences are related to many factors such as personality, experience, interests, and knowledge (Heerwagen, 2002).

Creative individuals were found to have siblings of like gender close in age (Cicirelli, 1967), coming from upper-class families (Forman, 1979), having parents who provide a complex and stimulating environment, and who exhibit a more equalitarian childrearing style (Dewing & Taft, 1973).
3.2.2.1 Personality

Personality psychologists tried to explain creativity in terms of comprehensive theories of personality (Taylor; Woodman, cited in Woodman & Schoenfeldt, 1989). A second major area of research deals with personality and biographical characteristics of outstanding creative individuals (for example Roe; Simonton, cited in Woodman & Schoenfeldt). Finally, specific personality aspects, such as locus of control, self-esteem or identity were investigated as being related to creative behaviour (Woodman & Schoenfeldt, 1989).

Regarding the creative personality, Martindale (1989) states that the more diverse and general a person’s store of ideas, the greater is the chance that a creative idea will appear. He claims that creative ideas arise from combining ideas from different disciplines. As creative people seem to have a wide range of interests, it is easier for them to draw from their store of knowledge (Martindale, 1989).

3.2.2.1.2 Cognitive processes

Another field of creativity research deals with cognitive style or ability. Cognitive factors thought to be related to creativity include cognitive styles, such as creative thinking or problem-solving styles, cognitive complexity, or divergent thinking (Woodman & Schoenfeldt, 1989).

Buchanan (cited in Heerwagen, 2002) claims that the cognitive processes generating creative outcomes are not different from everyday thinking. What differs is the context in which a creative idea arises. According to him, two cognitive processes are involved in creative thought: Combinatorial and transformational. The former implicates the production of “new combinations out of familiar ideas through generating and testing”, the latter implies the use of “analogical reasoning and metaphors to transfer concepts from one domain to another” (Heerwagen, 2002, p.2).

A number of researchers claim that creative problem solving also involves two different thinking processes: convergent, or analytical thinking and lateral, or associative thinking (Heerwagen, 2002).

Although many different mental functions relate to creativity, the operation of “divergent production” is seen as being particularly critical for creative behaviour.
This cognitive style or ability – perhaps identical to what other writers have called ideational fluency, adaptive flexibility, or the ability to generate logical alternatives – provides a good example of a cognitive ability-creative behaviour relationship that is empirically well supported. (Woodman & Schoenfeldt, 1989, p.79)

Neurological studies show that the brain works differently under the two kinds of thinking – divergent and convergent thinking. A higher degree of neural complexity was found under divergent thinking tasks. Investigators interpret this in the way that the brain accesses a wide range of memories and fantasies as raw material for creative ideas. Research also shows that brain activity during divergent thinking tasks is very similar to activity during mental relaxation (Dacey & Lennon, cited in Heerwagen, 2002).

Guilford, Torrance, Wallach and Kogan, and others have developed a large number of tests of “divergent thinking” (for example, the “Torrance Test of Creative Thinking”). These tests are assumed to measure original thinking, but, as Vernon (1989) criticises, “these tests are based on such trivial tasks as Alternate Uses, Similarities, and Verbal Fluency, which could not be expected to be of any relevance to real-life or high-level creativity” (Vernon, 1989, p.98). Nevertheless, Torrance claims that “repeated longitudinal studies have produced strong evidence of relationships between test behaviour and real-life creative achievement” (McGoff & Torrance, 2002, p.1).

3.2.2.1.3 External determinants
A third field of studies with much less emphasis deals with external determinants of creative behaviour. “The groups in which an individual participates – from the earliest family experiences to later friendship and work groups – clearly have some impact on behaviour, including creative behaviour” (Amabile; Torrance, cited in Woodman & Schoenfeldt, 1989).

Vernon (1989) argued that environmental factors appear to stimulate, or inhibit, creativity in general, or to affect certain types or aspects of creative production. Roe (cited in Vernon, 1989), for example, claimed in her survey that her subjects had unique personalities, but she found frequent basic patterns of childhood growth. Those included a high degree of independence and solitariness, impersonal relations
to parents, and encouragement of achievement and intellectual interests. Often, the artists were first born or only children, had poor health, which reduced the contact with other peers. Frequently, another relative, adult friend, or teacher had a strong influence on the artist. As Vernon (1989) states, investigations tend to support environmental explanations of creativity, but not to prove them.

Datta and Parloff (1969) found that creative individuals describe their parents as moderately affectionate, non-rejecting, and high in encouraging intellectual independence. Furthermore, creative subjects perceived their parents as using a rather open child-rearing style as opposed to authoritarian controls and punishment.

Shmukler (1982-1983) found in her research on 73 South African third-graders a relation between early home background and the expression of creativity. She concludes that an optimal balance between involvement, caring, and warmth on the part of the mothers, as well as willingness to let the child explore at his/her own pace makes future creative and imaginative expression possible.

The orientation of schools creative individuals attend also seems to influence the presentation of creative behaviour. Kaplinski (1980) reports that in a South African sample creativity measured by the TTCT appeared to be higher in schools of informal orientation as opposed to schools of formal orientation. Pupils at these schools were found to be less dogmatic, and feeling less limited by the boundaries of the syllabus.

### 3.2.1.2 Cross-cultural research on creativity

Torrance (1969) describes his classical cross-cultural study of creative development in seven different cultures: US, US African Americans, West Germany, Western Australia, Western Samoa, and India. Data were obtained on figural and verbal creativity tasks. The results indicate that the US group was superior in creativity tasks compared to West Germany, then Norway, Western Australia, US African Americans, India, and Western Samoa (in this order). Torrance concludes “that cultural factors strongly influence the course of creative development, the level of creative functioning, and the type of creative functioning that flourishes most” (p. 160). Torrance assumes that more highly developed countries stand separately from underdeveloped cultures. He argues that in the more developed countries, complexity and elaboration are required for satisfactory adjustment, whereas in less
developed cultures, “such complexity of thinking might be maladaptive” (Torrance, 1969, p. 160).

In a study on African-American college students on creative imagination, absorption, and dissociation, the subjects were found to score lower on the Creative Imagination Scale (CIS) than a European American comparison sample (Sapp & Hitchcock, 2003).

### 3.2.1.3 Gender-differences in creativity

Van Vliet (1995) found no gender differences in creativity measured by the TTCT in a South African sample.

On the other hand, gender differences were found in EEG patterns during divergent thinking. Creative men were characterized by massive amplitude increases interhemispheric coherence in the beta2 whereas creative women showed more local increases of the beta2 power and coherence. In contrast, the task-induced desynchronization of the alpha1 rhythm in creative women was topographically more expanded as compared with men who demonstrated greater interhemispheric coherence than women did. The authors suggest that their results propose a different hemispheric organization in men and women during creative thinking (Razumnikova, 2004).

### 3.2.1.4 Conclusion

Creative individuals were found to have siblings of like sex close in age (Cicirelli, 1967), coming from upper-class families (Forman, 1979), having parents who provide a complex and stimulating environment, and exhibit a more equalitarian childrearing style (Dewing & Taft, 1973).

Martindale (1989) found that creative individuals have a wide range of interests, which enables them to draw from their store of knowledge to create new ideas.

Cognitive styles such as divergent thinking (Woodman & Schoenfeldt, 1989), as well as convergent thinking (Heerwagen, 2002) seem to be related to creativity. A higher degree of neural complexity was found under divergent thinking tasks. The brain
seems to access a wide range of memories as raw material for creative ideas (Dacey & Lennon, cited in Heerwagen, 2002).

External determinants that might be involved in creative expression include non-rejecting parents (Datta & Parloff, 1969), as well as balanced child-rearing style between care and letting a child explore his or her environment (Shmukler, 1982-1983).

Cross-cultural factors also seem to influence the course of creative development. More highly developed cultures are assumed to encourage complexity and elaboration, which leads to higher creativity (Torrance, 1969). African-American students were, furthermore, found to score lower on a creativity measure than European Americans (Sapp & Hitchcock, 2003).

The findings on gender-differences in creative production are contradictory (Razumnikova, 2004; Van Vliet, 1995).

In summary, the latest point of view in theory and research is that creativity is an “adaptive feature of normal cognitive functioning that evolved to aid problem solving under conditions of uncertainty” (Heerwagen, 2002, p.1). Consequently, all human beings should have the potential for creativity. However, whether creativity is expressed or suppressed depends on the socio-cultural context, personality differences, and specific personal experience such as knowledge and skills (Heerwagen, 2002).

Woodman and Schoenfeldt (1989) conclude that “creative behaviour is a complex person-situation interaction that is influenced by events of the past as well as salient aspects of the current situation. Within the person, both cognitive and non-cognitive aspects of the mind are related to creative behaviour” (Woodman & Schoenfeldt, 1989, p.89).

Mainly six clusters of research findings are reported in the literature. The first finding is that creative individuals are found to be more intelligent than average, at least by a standard deviation or more (Haensly & Reynolds; Simonton, cited in Simonton, 1999). Intelligence seems to operate more as a threshold function, since it is unlikely
that an individual below a certain minimal intelligence, is capable of exhibiting creativity. However, beyond this threshold level, further increases in intelligence may or may not contribute to higher levels of creativity (Plucker & Renzulli, 1999). Nevertheless, a consensus among researchers regarding the relation between creativity and intelligence has not been found yet (Sternberg & O'Hara, 1999). Furthermore, intelligence can assume many different forms besides traditionally tested intelligence. Gardner (1985), for instance, assumes in his theory of multiple intelligences that there exist at least seven distinct intelligences: Verbal, logical-mathematical, spatial-visual, bodily-kinaesthetic, musical, intrapersonal, and interpersonal intelligences. Only the first two or three intelligences are usually examined in typical psychometric measures. However, all of the seven intelligences are associated with creativity (Simonton, 1999).

Secondly, creativity appears to involve a cognitive style more than an intellectual ability. In Sternberg's triarchic model of intelligence, for instance, creativity is said to be a separate mode of functioning, in contrast to analytical and practical forms of intelligence. Similarly, Guilford's "structure of intellect model" describes 120 distinct types of intelligences. Only a subset is assumed to be involved in creativity. Of particular importance is Guilford's distinction between convergent and divergent thinking. "Convergent" thought attempts to find the single correct answer to a given problem, whereas "divergent" thought endeavours to find many diverse responses. The latter concept has produced a large number of divergent thinking tests that have been successful in predicting creativity (Crammond, cited in Simonton, 1999). Other investigators propose that creative individuals are capable of generating unusual associative links between otherwise diverse concepts or stimuli (for example, MacKinnon; Mednick, cited in Simonton, 1999). In conclusion, it has been found that the creative mind is cognitively rich, with complex semantic networks loosely connecting various ideas (Simonton, 1999).

Thirdly, it has repeatedly been found that creative individuals exhibit perceptual richness. Creative persons are open to diverse experiences and show unusual tolerance to ambiguity (McCrae; Rogers, cited in Martindale, 1995). Creative people seem to search for novelty and complexity (MacKinnon, cited in Martindale, 1995) and have the ability to engage in "defocused attention". This ability allows the
creative person to attend to more than one stimulus or cognition at the same time (Martindale, 1995).

3.2.3 Research on creativity and hypnosis
The largest amount of research on hypnosis and creativity has been done at the levels of personality and process. In this research, two hypotheses formed the basis: One is that high hypnotisable subjects are more creative than low hypnotisable subjects. The other assumption is that hypnotised individuals are more creative than subjects in a waking state.

Regarding a possible link between absorption and hypnotisability, Council, Kirsch, and Hafner (cited in Nadon, Laurence & Perry, 1991) conclude from their study that this relation is highly reactive to contextual factors and probably mediated by a subject's expectancies. They found a statistically significant interaction between absorption and hypnotisability only when absorption was assessed in the context of hypnosis. When absorption was measured earlier and separate from hypnosis, no interaction was found. They conclude that administering an Absorption Scale to subjects may implicitly suggest that imaginative processes are important in hypnosis (Council et al., cited in Nadon et al., 1991).

Bowers (1970) found in his research on the effect of hypnotic susceptibility on creativity test performance that in eight out of nine measures, hypnotically susceptible subjects performed better than unsusceptible subjects. Women tended to perform more creatively on the creativity tasks than men. Bowers interprets his findings with a regression theory of hypnosis and creativity.

Creative people and highly hypnotisable people are found to have in common that they describe the experience of finding creative solutions or responding to hypnotic suggestions as “effortless”. Bowers (1978) suggests that receptiveness to subconscious work forms the basis for the experience of effortlessness in both tasks. She describes an experiment in which she found highly significant effects of the level of hypnotisability on scores of effortless experiencing and creativity with intercorrelations of about $r = .60$. As expected, effortless experiencing accounted for much of the relationship between level of hypnotisability and creativity.
It is assumed that procedures known to increase right-hemisphere activation can facilitate creativity. In high-hypnotizable subjects, hypnosis enhances right-hemisphere activation (Martindale, 1999). Gur and Raynor (cited in Martindale, 1999) found that individuals performed better on creativity measures when hypnotized.

Bowers (1979) attempts to link hypnotisability and creativity via reliance on non-volitional fantasy processes cued by a task. The fantasy process is indexed in the studies she reviewed by the degree of effortless experiencing of responses to tasks involving imagination. She claims that absorption in non-hypnotic experiences and a preference for right-hemispheric functioning are linked. Creative solutions could be generated under the condition of allowing the structure of a problem to affect associational processes without using interfering volitional selection strategies.

Following Shames and Bowers' (1992) method of the study of creativity in relation to hypnosis, a four-fold approach of investigation will be utilized in the following section. Shames and Bowers base their considerations on the notion that a hypnotic subject is an “active participant in the hypnotic experience who takes advantage of the opportunity to elaborate creatively on the suggestions that are offered “(Shames & Bowers, 1992, p. 334).

3.2.3.1 Relationship at the level of personality
Creativity and hypnosis are both considered stable personality traits. A relationship between them should manifest in two ways: Creative individuals should share specific characteristics with hypnotisable subjects; and personality measures of creativity and hypnotisability should be significantly correlated.

Studies on characteristics associated with creativity in art, literature, music, and science (Barron & Harrington, cited in Shames & Bowers, 1992) have found a stable set of personality traits that significantly correlates with indicators of creative ability and achievement in different domains. A number of traits is subsumed under the various creative personality scales that are used in combination with Gough and Heilbrun’s (cited in Shames & Bowers, 1992) Adjective Check List. Creative individuals are described, for example, as absent-minded, impulsive, independent, rebellious, sensitive, unconventional and so forth. The traits identified in the creativity scales for the Adjective Check List are assumed to be core characteristics shared by
creative individuals across domains. Yet, some traits show field, age, or gender specificity in terms of their degree of correlation with creativity indicators (Barron & Harrington, cited in Shames & Bowers, 1992).

Summarizing research on the two questions, Shames & Bowers (1992) conclude that hypnotisability has not been found to correlate with traits measured by multidimensional personality inventories such as the Minnesota Multiphasic Personality Inventory. Nevertheless, researchers have found three interrelated constructs that do correlate significantly with hypnotisability: Absorption, imaginative involvement, and fantasy proneness.

According to Shor (cited in Shames & Bowers, 1992), the experience of hypnosis is “characterised by an absence of the subject's usual awareness of the environment and his or her place in it” (Shames & Bowers, 1992, p.341). He spoke of a loss of a “generalized reality orientation” (GRO) in this context. GRO is not limited to hypnosis. Most people report occasional loss of awareness of their environmental frame of reference, for example while reading a book, or staring at an object.

Deikman (cited in Shames & Bowers, 1992) describes a study in which subjects were asked to stare at a blue vase for a brief period of time. The subjects reported various types of perceptual distortions, such as loss of the third dimension, or diffusion of the vase's boundaries. One subject reported to feel as though the vase was in his or her head rather than out there, like a part of the person.

This description of a subject-object merging is consistent with Tellegen and Atkinsons's (cited in Shames & Bowers, 1992) construct of “absorption”. They define absorption as the subject's “full commitment of available perceptual, motoric, imaginative, and ideational resources to a unified representation of the attentional object” (p. 274).

In one of their studies, the Tellegen Absorption Scale (TAS) loaded on an absorption factor that was related to hypnotisability. However, it did not load on two factors usually found in personality inventories, namely “extraversion” and “introversion” (Eysenck, cited in Shames & Bowers, 1992), or “ego control” and “ego resilience” (Block, cited in Shames & Bowers). Fromm and Kahn (cited in Shames & Bowers)
found that absorption is one of the structural factors comprising the essence of self-hypnosis as well.

“The validity of the absorption construct has been demonstrated in repeated findings of its relation to standardised scales of hypnotic responsiveness” (cited in Shames & Bowers, 1992, p. 342). Correlations of the TAS with the SHSS:C are reported to be higher than .22. A recent study of Balthazard and Woody (1992) reports that passing difficult hypnotic suggestions is more highly related to absorption than to passing easy items.

This finding suggests that absorption might be an important factor in facilitating hypnosis. Kihlstrom et al. (1989) claim that the TAS “seems to measure the individual's capacity for dissociative and holistic experiences involving, respectively, the narrowing and broadening of attentional focus” (p. 259, cited in Shames & Bowers, 1992).

Tellegen describes absorption as “a disposition, penchant or readiness to enter states characterized by cognitive restructuring” (cited in Shames & Bowers, 1992, p. 343). Taking these statements together, it can be concluded that absorption is a personality trait that enables hypnotisable subjects the experience of hypnotic behaviour (Shames & Bowers, 1992).

Regarding creativity, absorption has not been investigated to the same extent as in hypnosis. However, there is evidence that supports the notion that a construct similar to absorption plays a significant role in the creative experience.

K.S. Bowers (cited in Shames & Bowers, 1992) suggests that “total immersion of the scientist in his field seems to be an important condition of genuine creativity” (p. 259). The ability to completely focus on a task has often been referred to as a personality trait of creative individuals.

Empirical findings regarding the relationship of absorption and creativity are very limited. Bowers (1978) reports a correlation of .39 between scores on an absorption questionnaire developed in her laboratory and a composite creativity measure. The creativity score was obtained from two self-estimates of creativity and the Gilford
Consequences Test, a performance measure of creativity. In this study, no personality measure of creativity was utilized.

Imagination can also be seen as a common element of both hypnosis and creativity. “Both experiences are often characterised by the ability to form a mental image, to maintain the image in awareness, and to become involved in the image…Historically, researchers have interpreted hypnotic behaviour in term of these abilities (Weitzenhoffer, 1980)” (Shames & Bowers, 1992, p. 343). Creativity and imagery are, according to Durio (cited in Shames & Bowers, 1992), similar constructs that have a group of factors in common including originality and fluency of responses, spatial abilities, and spontaneous and free association.

Creative individuals are often characterised by extraordinary imagery skills. E.R. Hilgard (cited in Shames & Bowers, 1992) refers to that ability as “creative imagination”.

The relationship of hypnotisability and imagination has been studied extensively. J.R. Hilgard (cited in Shames & Bowers, 1992) discovered in her research on personality traits predictive of hypnotisability the construct of “imaginative involvement”. “She found that high hypnotizable subjects were more likely than low hypnotizable subjects to report a history of satisfying experiences in which they would become engaged in fantasy while reading a book, listening to music, or participating in any of a number of activities in their everyday lives that might allow them to temporarily set aside their ordinary reality” (Shames & Bowers, 1992, p.344).

Wilson and Barber (cited in Shames & Bowers, 1992) called their findings “fantasy proneness”, which is a slightly adapted version of this construct. They describe fantasy prone individuals as “living much of the time in a world of their own making – in a world of imagery, imagination, and fantasy” (cited in Lynn & Rhue, 1988, p. 36). Lynn & Rhue (cited in Shames & Bowers, 1992) found in their studies a correlation between hypnotisability and fantasy proneness. However, the majority of fantasy prone individuals in their studies scored high on measures of hypnotisability. Fantasy proneness does not show to be a reliable predictor of hypnotisability.
K.S. Bowers (cited in Shames & Bowers, 1992) proposes that correlations of hypnotisability and measures of imaginative involvement and fantasy proneness do not necessarily prove that imagination and goal-directed fantasy mediate hypnotic responsiveness. Rather this finding suggests that those two constructs are concomitants of the mechanism by which hypnotic response occur. Research referred to by Bowers shows that hypnotized subjects can respond to suggestions that involve no or incompatible imagery. This finding supports the notion that hypnotic response is not mediated by imagery-related abilities.

However, the facts that imaginative involvement in activities outside of hypnosis are predictive of hypnotisability (J.R. Hilgard, cited in Shames & Bowers, 1992), and that some high hypnotizable subjects might need fantasy and imagination to achieve hypnotic response (Spanos, cited in Shames & Bowers, 1992), indicate that the ability for imagery-based thinking is an important factor in hypnotic responsiveness without mediating the response process.

Regarding creativity, Lynn and his associates have found a significant correlation with fantasy proneness on the Barron-Welsh Revised Art Scale and the Guilford Consequences Test. For imaginative involvement no known correlational findings are currently available (Shames & Bowers, 1992).

Summarising the findings, the concept of absorption is not truly separate from fantasy proneness and imaginative involvement. Lynn and Rhue (1988) found a high correlation between fantasy proneness and absorption ($r > .70$). They conclude that “the constructs of fantasy proneness, imaginative involvement, and absorption are but truly discriminable; they converge in their emphasis on cognitive abilities related to imagination and fantasy that bridge hypnotic and nonhypnotic context” (Shames & Bowers, 1992, p. 345).

The most direct link between hypnosis and creativity at the level of personality can be observed in the correlation between the measures of the two constructs (Shames & Bowers, 1992).

Several studies have found significant correlations between measures of hypnotisability and creativity. K.S. Bowers and van der Meulen (cited in Shames &
Bowers, 1992), for instance, found that high hypnotisable subjects achieved significantly higher scores on eight of the nine creativity measures used (Guilford Consequences Test, Holtzman Inkblot Technique, free-association test). They also found a gender difference in creative performance with women scoring significantly higher than men on all measures, regardless of their level of hypnotic susceptibility.

A gender difference was also found in a later study by K.S. Bowers (cited in Shames & Bowers, 1992), in which male and female participants were tested on a battery of creativity tests. A composite creativity score showed a significant correlation with hypnotic susceptibility only in female participants. Similar findings are reported from Perry, Wilder, and Appignanesi (cited in Shames & Bowers). However, in a more recent study by P.G. Bowers (cited in Shames & Bowers) an equal correlation \( r = .55 \) was found for both genders.

Ashton and McDonald (1985) also found that female subjects obtained higher scores than low hypnotisables on the scoring categories of the TTCT, as well as on the composite index of overall creativity. However, L.M. Jackson and Gorassini (cited in Shames & Bowers, 1992) could not replicate their findings in a sample of both, male and female subjects. These results could lie in the fact that they did not considered gender effects, and they used the CURSS as susceptibility measure.

\subsection*{3.2.3.2 Relationship at the level of process}

Ashton and Bowers (cited in Shames & Bowers, 1992) claim that researchers investigating if hypnosis and creativity are related processes, they must rely on subjects' introspection of their experience during these processes. However, this form of measurement also has its limitations. Subjective report is susceptible to numerous forms of distortion, as can be found in both the hypnosis literature as well as reports of creative experiences (Shames & Bowers, 1992).

Subjective reports suggest that the two processes are linked by a cognitive restructuring that modifies awareness (Shames & Bowers, 1992).

Tellegen views absorption as “readiness to depart form more everyday life cognitive maps and to restructure…one's representation of one's self and its boundaries” (cited

Hypnotic suggestions often entail a certain “incongruence” (Tellegen, cited in Shames & Bowers, 1992). Hence, in order to successfully respond to a suggestion, subjects need to have the ability to focus on the information contained in the hypnotic suggestion, while ignoring contradictory information.

Empirical findings support the notion that high hypnotizable subjects also achieve high scores on measures of absorption. Bartis and Zamansky (cited in Shames & Bowers, 1992), for instance, demonstrated that high hypnotizable subjects, in contrast to low hypnotisables, can successfully perform hypnotic tasks when given contradictory information.

Shames and Bowers (1992) suggest that “absorption may be the doorway through which a hypnotised subject must pass in order to experience the “classic suggestion effect”, in which responses appear to the subject to be occurring involuntarily” (p. 348).

Creative thought might be facilitated by absorption, as well. However, for both constructs the role of absorption in initiating a cognitive shift of some sort is not well understood yet. “However, the end result of this process for both hypnosis and creativity is that certain mental representations, as well as the processes that act upon them, undergo changes that affect awareness” (Shames & Bowers, 1992, p. 348).

Awareness is used in this context to refer to phenomenal awareness as the sum of the mental contents on which an individual is able to introspect and report. Information can remain outside of awareness as it is either permanently or temporary inaccessible (Kihlstrom, cited in Shames & Bowers, 1992).

Awareness can be modified by one of two processes; either when previously inaccessible information is retrieved, or when previously accessible information becomes unretrievable (Shames & Bowers, 1992).
Wallas (cited in Shames & Bowers, 1992) introduces the notion that some kind of modification in awareness takes place in the creative process. The four stages he identified are “preparation”, “incubation”, “illumination”, and “verification”. Preparation includes thinking about or learning the mental elements that might be relevant to the particular problem. A solution is often not found in this phase. That is why the problem is set aside, the period of incubation. After a while, the solution to a problem might just occur, which is the stage of illumination or inspiration. In the end, the new idea is put through to logical analysis and transformed into its final form in the phase of elaboration (Martindale, 1999). Shames and Bowers claim that, in the illumination stage, some type of awareness modification seems to occur to include previously inaccessible information.

A shift from one type of thinking to another seems to be involved in a subject's progression through the stages. Kris (cited in Shames & Bowers, 1992) claims that the shift occurs from a secondary-process type of thinking to a more primary-process one. Osborn (cited in Shames and Bowers, 1992) has drawn a distinction between “imaginative” and “evaluative” thinking. Deikman (cited in Shames and Bowers, 1992) described the categories “passive-receptive” and “active”, while de Bono (cited in Shames and Bowers, 1992) distinguishes between “vertical” and “lateral” thinking. According to Shames and Bowers, other researchers have talked about “analytic” opposed to “holistic” processes, or left- versus right-hemisphere activity.

These perspectives have in common that the creative process entails a cognitive shift from a more common mode of thinking to a different form of thought; and that this shift facilitates the modification of awareness that is characteristic of creative insight (Shames & Bowers, 1992).

Regarding hypnosis, the classic suggestion effect can be viewed as a different type of awareness modification. It entails the temporary inability to access previously accessible information. Although some investigators (Lynn, Rhue, & Weekes, cited in Shames & Bowers, 1992) claim that hypnotized subjects maintain control over their behaviour, researchers agree that subjects still experience a sense of diminished volitional control during hypnosis. It was found in numerous studies that high hypnotisable subjects are more likely than low hypnotisables to report involuntariness (K.S. Bowers; P.G. Bowers, Laurence, & Hart, cited in Shames & Bowers, 1992). The
participants seem to lose control over their normal awareness of volitional control over their responses to hypnotic suggestions.

E.R. Hilgard (cited in Shames & Bowers, 1992) offered an explanation for this phenomenon in his neodissociation theory. Hypnosis disrupts links between cognitive structures. This leads to divided consciousness, in which thoughts are not represented in phenomenal awareness. Most hypnotic phenomena can be explained with this theory, as subjects are either not aware of information that is normally consciously accessible or they experience that their actions are not under conscious control.

Neodissociation theory can also be utilized to explain those aspects of the creative process that may involve nonvolition. Shames and Bowers (1992) claim that such an element can be observed in the creative process. They criticize that Higard's theory cannot account for aspects of the creative process as well as of hypnosis that enhance cognitive processing.

Creativity is described by Martindale (1999) as being automatic and effortless. P.G. Bowers' (cited in Shames & Bowers, 1992) construct of "effortless experiencing" is similar to hypnotized subjects' feelings of nonvolition. "Bowers suggests that hypnotized subjects who perceive that their responses are happening without any effort on their part are having a type of experience similar to what takes place in the illumination stage of the creative process" (Shames & Bowers, 1992, p. 350f).

Creative individuals often describe their experience of having an idea as effortless and without any conscious control. Yet, some stages of the creative process require active, disciplined thought, while other stages involve a more passive tactic (Shames & Bowers, 1992).

As the descriptions of creative individuals are very similar to those by hypnotised subjects, it can be assumed that measures of effortless experience correlate highly with both measures of creativity and hypnotisability. P.G. Bowers (cited in Shames & Bowers, 1992) investigated this question by using various imagery, fantasy, and consequences tasks combined with a self-rating scale for effortless experiencing. The score of effortless experiencing showed correlations of .61 and .62 with
hypnotisability and creativity. This correlation was higher than that found for hypnotisability and creativity \((r = .55)\). In one study, the latter correlation dropped to a nonsignificant correlation of \(r = .27\), while effortless experiencing was constant. This finding indicates that the relationship of hypnotisability and creativity may be mediated by the variance of effortless experiencing (P.G. Bowers, cited in Shames & Bowers, 1992). Bowers also suggested that the creative style of a person, rather than the degree of creativity, might be related to measures of hypnotisability.

P.G. Bowers combines in her writings about effortless experiencing a unique theoretical perspective, in that it combines concepts of psychoanalytic theory and elements of cognitive psychology. The basis for this notion is the concept of “associative networks” (Shames & Bowers, 1992).

According to Bowers (cited in Shames & Bowers, 1992), effortlessness is the critical link in the understanding of similarities between the processes essential to hypnosis and creativity. Both processes involve a shift in the mode of thinking, so that the experience becomes effortless. Bowers differentiates between an active mode of thinking, which is characterized by realistic, logical, sequential rules of association, and a more passive mode which she calls “fantasy”. Activity and passivity are not distinct categories, and this categorisation may be complicated by other factors such as focused or expanded attention (Fromm, cited in Shames & Bowers, 1992).

According to Bowers (cited in Shames & Bowers, 1992), the active mode is accessed in a normal state of arousal. In this state, goals, expectations, and strategies control awareness, and information is stored and retrieved in the form of language. These characteristics of the active mode limit the range of priming within the associative network. As Bowers points out, language diminishes experiences to match semantic categories. Hence, language limits the number and types of associations that an individual can derive from an experience, so that thinking becomes conventional (Shames & Bowers, 1992).

These limiting effects of awareness are eluded in the passive mode. Consequently, images, rather than words, happen to be the primary form of information storage and retrieval, and a wider associative network is primed (Shames & Bowers, 1992).
Shames and Bowers (1992) point out that they find support for their theory in the work of Spence and Holland (cited in Shames & Bowers, 1992), who found that conscious awareness of a stimulus may limit associations to the stimulus, contrary to associations that are made when a stimulus is presented beyond conscious awareness. Further they cite a series of studies by Martindale, who found that low levels of arousal bring about increases in performance on creativity measures (Shames & Bowers, 1992).

MacKinnon (cited in Shames & Bowers, 1992) has stated “the truly creative person might be distinguished from the non-creative individual by his great ease in moving from more conscious and active to more unconscious and passive states. One might inquire, then, about the ease and speed with which the creative person, as compared with others, falls asleep, enters into a hypnotic trance upon suggestion from another person, or passes into self-induced states of trance or semi-trance” (p. 227).

The creative person and the highly hypnotisable individual have in common that both “have a greater than normal capacity for transition from an active to a passive mode of thinking” (Shames & Bowers, 1992, p. 352). P.G. Bowers (cited in Shames & Bowers, 1992) points out that a creative person must be able to allow an idea or object to influence associations and responses while temporarily avoiding ego-controlling, intentional processes. “This ability to let the structure of the creative problem determine the types of associations that are made may account for certain characteristics of creative individuals, such as their high level of tolerance for ambiguity and their preference for complexity” (Dellas & Gaier, cited in Shames & Bowers, 1992, p. 352).

Shames and Bowers (1992) summarise that creative, as well as hypnotisable individuals “are able to shift into the passive mode of thinking in response to the appropriate set of conditions, such as those associated with a creative task or a hypnotic induction. Such individuals can allow the circumstances to direct their fantasy processes without competition from conscious decision making, which might otherwise override this response. Effortlessness, then, is experienced to the degree that an individual's task response has been influenced by nonvolitional fantasy associations as opposed to volitional, controlled decision making” (Shames & Bowers, 1992, p. 353).
3.2.3.3 Relationship at the level of production

Besides personality and process, another point of similarity is at the level of production. Shames and Bowers (1992) claim that “creativity can be operationalized most effectively at the level of production, since a creative product is more directly measurable than either cognitive process or a personality trait” (p. 354).

Most creativity measures entail that the subject needs to generate a product in response to certain instructions. The product is evaluated, then, according to specific guidelines. “The products in these tests tend to be simple and fairly restricted, since the tests themselves are similar to tests of intelligence in their construction and scoring” (Shames & Bowers, 1992, p. 354). The TTCT, for instance, asks the subjects to complete a number of drawings.

Scoring systems for creativity tests are based on criteria like originality, elaboration, usefulness, and attractiveness. Torrance (cited in Shames & Bowers, 1992) developed four categories of relevant responses: Fluency, which is the number of relevant responses; flexibility, or the number of different categories of information represented in a response; originality, defined as the statistical frequency of a response within a normative sample; and elaboration, which is the number of ideas represented in a response. Creativity is here operationalised in such a way that the amount of information included in a response is as important as their quality (Shames & Bowers, 1992).

Research on the question whether hypnosis enhances creative performance has produced a wide variety of responses. Gur and Reyher (cited in Shames & Bowers, 1992), for example, found no significant differences in performance on the verbal subtests between hypnotized subjects and participants that received the standardized TTCT instructions. Without hypnosis, the modified instructions resulted in an inhibition of verbal creativity and an insignificant increase in figural creativity. The effect of hypnosis in this study was to prevent suppression of verbal creativity through the modified administration procedures, as well as to enhance figural creativity. Gur and Reyher's findings are weakened by the absence of a comparison group of hypnotised subjects receiving the standardised instructions of the TTCT. Furthermore, the investigators did not account for the inhibition of verbal creativity in
the control group who were given the modified instructions (Shames & Bowers, 1992). Ashton & McDonald (1985) found no hypnotic treatment effects on the TTCT in female subjects; L.M. Jackson & Gorassini (cited in Shames & Bowers, 1992) found that figural creativity was enhanced after hypnotic procedures for all subjects, not only for highly hypnotizables.

This field of research consistently fails to produce robust findings. Shames and Bowers (1992) claim that methodological differences seem to underlie this disagreement among researchers. They further state that the huge number of various definitions of creativity, different instruments, as well as theoretical perspectives on creativity contribute to these issues. Furthermore, many instruments in creativity research are intended to measure constructs as divergent thinking and primary-process thinking, which may only include a narrow range of abilities related to creativity.

The only creativity instruments that are used consistently in research are the verbal and figural subtests of the TTCT, which should enable researchers to compare their findings. However, the TTCT has been administered in so many different ways – some investigators used shortened versions or only female or only high hypnotizable subjects – that comparison is almost impossible (Shames & Bowers, 1992).

Gur and Reyher (cited in Shames & Bowers, 1992) drew attention to the fact that administration of standardized creativity tests may be inappropriate for use with hypnotized subjects. They created a more comfortable setting for their participants by, for example allowing their subjects to respond orally. However, by altering the test instructions, they reduced the reliability of their findings and made it difficult to compare their outcomes to other research findings.

Shames and Bowers (1992) further state that researchers in this area have often ignored the difference between “trait” and “state” measures. A “test of creative performance assesses a single instance of creativity and thus may not be appropriate for use in research that examines the relationship of hypnosis and creativity at the level of personality. Problems arise when an individual's performance in a given context does not reflect the general tendencies of that individual” (Shames & Bowers, 1992, p. 358).
3.2.3.4 Relationship at the level of press

Press is defined as the interaction of individuals with their environment. There is evidence for the notion that situational variables causing this interaction play a critical role in both hypnosis and creativity (Shames & Bowers, 1992).

Teresa Amabile argues that the individual's motivational disposition is strongly linked to creative performance. In addition, she claims that an environment that encourages an intrinsic motivational orientation also facilitates creativity (Hennessy & Amabile, cited in Shames & Bowers, 1992).

A predecessor of this principle is Carl Rogers' (cited in Shames & Bowers, 1992) notion of “conditions for creativity”. He claimed that the most effective environments for promoting creativity are those that entail psychological safety and freedom from external evaluation. Research on rewards for creative production support this notion (Hennessy & Amabile, cited in Shames & Bowers, 1992).

Social-psychological theorists hold the notion that a hypnotic response is a “scripted role enactment in which subjects modify responses strategically in terms of shifting role demands. . . Hypnotic responses are regarded as goal-directed actions, and reports of involuntariness reflect context-generated interpretations of these goal-directed actions” (cited in Shames & Bowers, 1992, p.360). Hypnotised subjects accordingly actively control their responses in order to satisfy the role requirements of hypnotic suggestions.

Lynn and Sivec (cited in Shames & Bowers, 1992) view hypnotic behaviour as creative problem-solving in which subjects use various cognitive strategies and abilities in order to reach specific goals. These goals entail the experience of hypnotic events in order to fulfil implicit and explicit contextual demands.

Contrasting to Lynn and Sivec's notion of the hypnotized subject, Amabile (cited in Shames & Bowers, 1992) has argued that extrinsic motivation to conform to a goal hinder an individual's effectiveness in solving creative problems. If hypnotic behaviour was facilitated by demands and expectations, then it can be doubted that hypnosis would form a particularly advantageous situation for any creative behaviour (Shames & Bowers, 1992).
A more significant point, however, is that the effect sizes associated with manipulation of motivational orientation are extremely small. The notion that the variable of motivation has limited predictive power should be self-evident. If a change in motivational orientation were sufficient to enhance creative performance, then creativity would be a rather commonplace experience. The mechanism by which creativity takes place is not well understood, but it is evident that the process involves much more than simple motivation. (Shames & Bowers, 1992, p. 361)

3.2.3.5 Conclusion

Hypnotically susceptible individuals were found to be more creative than less hypnotisable subjects (Bowers & van der Meulen, cited in Shames & Bowers, 1992). Highly creative and highly susceptible people seem to have in common that they describe the finding of creative solutions and responding to hypnotic suggestions, respectively, as effortless (Bowers, cited in Shames & Bowers, 1992).

At the level of personality, absorption, imaginative involvement, and fantasy proneness were found to be correlated with hypnotisability (Shames & Bowers, 1992). Absorption was also found to be important for creativity to occur (Bowers, cited in Shames & Bowers). Imagination is another factor that seems to be involved in hypnosis and creativity (Shames & Bowers).

At the level of process, hypnosis and creativity seem to be linked by a cognitive restructuring that modifies awareness. Thought processes during hypnosis, as well as creative thought might be facilitated by absorption (Shames & Bowers, 1992). Thereby, a shift from secondary to primary process thought takes place (Kris, cited in Shames & Bowers). This shift facilitates the modification of awareness that is characteristic of creative insight. In hypnosis, awareness modification also takes place and volitional control seems to be diminished. Neodissociation theory can explain both phenomena (Shames & Bowers). Nonvolition can also be observed in the creative process, as creativity is described as automatic and effortless (Bowers, cited in Shames & Bowers). Effortlessness seems to be the critical link in understanding similarities between the processes involved in hypnosis, as well as creativity. It was also found that creative individuals, as well as highly hypnotisable
people are able to shift from more conscious and active to more unconscious and passive states (Shames & Bowers).

At the level of press, psychological safety and freedom from external evaluation seem, according to Rogers (cited in Shames & Bowers, 1992), to be enhancing creativity. Intrinsic motivation also seems to be important (Hennesy & Amabile, cited in Shames & Bowers, 1992).
CHAPTER 4
METHODOLOGY

4.1 Permission

Permission to conduct this study was asked from the Ethics Committee of the University of Stellenbosch. Every participant filled in an informed consent form explaining in detail the nature of the study.

Furthermore, the authors of both, the SHSS:C and the ATTA were asked for permission to use the measurement instrument. In addition, they were consulted on questions regarding scoring of the tests.

4.2 Subjects

The sample for this research was an ad hoc sample including 36 volunteer male and female students enrolled in psychology classes at the University of Stellenbosch. The sample consisted of 15 white female students, 11 white male students, and 10 black female participants. Due to the composition of psychology classes at the University of Stellenbosch with primarily white female students, not enough black male students could be found for this study to form a comparison group of sufficient size. The mean age is 20.2 years with an age range of 18 to 25 years. Most of the participants rated themselves as coming from a middle socio-economic background. In order to minimise contamination of the study, only participants without any previous experience with hypnotic techniques were selected.

4.3 Research design

For this study, differential and correlational research with a quasi-experimental, independent groups design was employed (Graziano & Raulin, 2004).

Differential research was done on the questions whether there are differences in hypnotic suggestibility between young adults of different ethnic groups, and on the assumption that there are gender differences in suggestibility amongst black and white young adults. Correlational research was done on the question whether there is a positive relationship between creativity and suggestibility in young adults and whether there is a positive relationship between individual creative background and creative potential.
4.4 Measuring instruments
For the purpose of this research, the Stanford Hypnotic Susceptibility Scale, From C (Kihlstrom, 2003), the Abbreviated Torrance Test for Adults (McGoff & Torrance, 2002), and a biographical questionnaire on individual creative background were utilized.

4.4.1 Stanford Hypnotic Susceptibility Scale
In the current research, the SHSS form C was utilized. The SHSS:C is still widely used, and has become the criterion against which new measures of hypnotizability are assessed (Perry, Nadon, & Button, 1992). The SHSS are one of the oldest and most widely used scales for hypnosis research. For more than 30 years, the different Stanford scales of hypnotic susceptibility have functioned very well in the field of hypnosis (Kossak, 1993b).

The SHSS:C is a modified form of the SHSS. This form, in contrast to the previous forms A and B, contains apart from motor tasks mainly cognitive items of greater difficulty (Kossak, 1993b). “Included are such phenomena as muscular movements or inhibitions, sensory amnesia, and dreams within hypnosis” (Hilgard, 1991, p. 86). This implies that the SHSS:C allows researchers to better differentiate levels of high hypnotisability (Benham, Smith, & Nash, 2002).

For this study, Kihlstrom’s (2003) version of the SHSS:C was used. He basically made five modifications regarding items 0, 7, 9, 12, and 13 in his version of the scale. For example, the wording of the induction by eye closure has been modified to reduce connotations of authoritarian control present in the original version, and anosmia replaces ammonia with peppermint oil. Research shows that posthypnotic amnesia rarely occurs in the laboratory (Kihlstrom, cited in Udolf, 1987). That is one reason why this item was eliminated from the list for the current research.

The 12 test items of the SHSS:C are arranged in order of increasing difficulty (Udolf, 1987). Hilgard (cited in Perry et al., 1992) suggested classifying subjects into a four-fold categorization (very high, high, medium, and low). However, not all researchers have followed this recommendation. Some investigators treat scores of eight to twelve as high, and zero to four as low, with the remaining subjects (scoring from five to seven) being classified as medium. Others classify scores from nine to twelve as
high and from zero to two as low hypnotizable (Perry et al., 1992). For the purpose of this study, the four-fold categorization proposed by Hilgard will be used with scores from zero to three being classified as low, four to six as medium, seven to nine as high, and ten to twelve as very high.

The SHSS:C was standardized on a sample of 101 male and 102 female undergraduate students (Udolf, 1987). The reliability coefficient is reported with $r=.85$ (Kossak, 1993b).

Hilgard (1991) claims that most items of the SHSS show “face validity”, that is, the test of internal consistency was satisfactory when applied to the new items. He also claims “that scores on hypnosis can be considered representative of hypnosis if these scores correlate with the scores of a number of other items known to represent hypnosis” (Hilgard, 1991, p. 86f).

4.4.2 Abbreviated Torrance Test for Adults

The principal measure of creativity was the Abbreviated Torrance Test for Adults (McGoff & Torrance, 2002). The TTCT was developed in 1966 by Dr. E. Paul Torrance, and has been translated into over 35 languages (Millar, cited in Kim, 2004). It is the most widely used creativity measure (Davis, cited in Kim), and it is the most referenced of all tests of creativity (Lissitz & Willhoft, cited in Kim).

The TTCT is more studied and analysed than any other creativity test (Johnson & Fishkin; Swart; Treffinger, cited in Kim, 2004). It has one of the largest norming samples, with support from numerous longitudinal studies (Davis, cited in Kim) and high predictive validity over a very wide age range (Cropley, cited in Kim).

The TTCT are recognized for assessment of creative thinking abilities since their first publication in the mid 1960s. Longitudinal studies give strong evidence of relationships between test-behavior and real-life creative achievement. Studies of the TTCT’s validity by a variety of researchers show excellent results regarding content, concurrent, and construct validity (Center for creative learning, 2002). The TTCT are “the most commonly used test of divergent thinking” (Plucker & Renzulli, 1999, p. 39).
Interscorer reliabilities are presented exceeding .90 from numerous studies. Test-retest reliabilities and alternate-form reliabilities are reported to be between .59 and .97 (Center for creative learning, 2002).

Due to the extensive time required to administer the entire battery of the Torrance Tests of Creative Thinking (TTCT), the abbreviated version was used in this research. As all scoring and analyses of the creative abilities assessed are consistent with the original TTCT, the Abbreviated Torrance Test for Adults (ATTA) is basically an alternate form of the TTCT. McGoff and Torrance (2002) report a KR21 reliability coefficient of $r = .90$ for ATTA composite raw scores.

The ATTA contains three activities, where the subjects are asked to provide multiple responses to either figural or verbal tasks. Activity 1 asks the respondent to imagine that he or she could walk on air or fly, and then to name the difficulties he or she might experience. Activity 2 presents two incomplete figures and asks the subject to draw pictures with these figures and try to make the pictures as unusual as possible. Activity 3 presents a group of triangles and asks the respondent to draw as many pictures of objects as they can draw using the triangles (McGoff & Torrance, 2002).

The verbal and figural tasks were scored for fluency (the number of different relevant ideas), originality (the ability to produce uncommon ideas or ideas that are totally new or unique), elaboration (the ability to embellish ideas with details), and flexibility (the ability to process information or objects in different ways, given the same stimulus) (McGoff & Torrance, 2002).

Creative ability was indicated by the creativity index. This is a composite of all individually assessed creative abilities mentioned above plus the creative indicators (such as richness and colourfulness of imagery). Scores from 1 to 50 were classified as minimal, 51 to 59 as low, 60 to 67 as below average, 68 to 73 as average, 74 to 77 as above average, 78 to 84 as high, and 85 and above as substantial creative ability.

4.4.3 Biographical questionnaire
A questionnaire on the biographical background of creative individuals was developed by the researcher. The questionnaire was based on several studies on
characteristics of parents of creative children (Dewing & Taft, 2003), family influences on creativity (Kemple & Nissenberg, 2000), sibling constellation and creative achievement (Cicirelli, 1967), and individual differences in artistic achievement (Crozier, 2003).

The answers to the questionnaire are indicative of the subject’s individual creative background. The questionnaire items were analysed for their relationship with the total creativity index.

4.5 Procedure

Students at the University of Stellenbosch were given a talk about the nature of hypnosis and the purpose of this study in an introductory psychology lecture. Volunteer students from these classes indicated their interest in taking part by signing on a list. Then, the participants were selected randomly from this list, according to ethnical background.

The 36 subjects participating in this study were seen individually. Again, the examiner, a registered professional psychologist trained in hypnosis, explained the procedure and the purpose of this study to each participant. Afterwards, the psychologist administered the induction procedure from SHSS:C. Following the induction, the psychologist read the instructions of the test to the subject and performed the test.

Afterwards, the students were brought to another room, where the next two tests took place. The researcher of this study served as examiner of the ATTA. The examiner read the instructions of the test to the subject, and the student performed the test. Timing for the tasks followed exactly those periods specified by McGoff and Torrance (2002) in the ATTA test manual.

Then, the biographical questionnaire was handed out to the participant. The questionnaire was explained to the student. Each student was asked several questions about his or her individual creative background. Each participant filled in the questionnaire individually.
Finally, the subjects were given the opportunity to return to the examiners at a later date to ask questions and to discuss further the nature of the experiment.

Each ATTA was evaluated for the creativity index by three selected and trained examiners. The Cronbach's alpha value for the three examiners was .975.

4.6 Statistical procedures
Data were analysed by means of the Statistical Package for Social Sciences (SPSS) and STATISTICA.

With the aim of evaluating the mean differences in hypnotic suggestibility between the groups (ethnic groups, male – female), analyses of variance (ANOVA) were calculated.

In order to investigate the relationship between creativity and suggestibility, and creativity and individual creative background in young adults, respectively, regression analyses were computed.
CHAPTER 5
RESULTS

The primary aim of this study was to present and examine the relationship between hypnotic suggestibility, creative potential and cultural identity.

The results of SHSS:C and ATTA were used to determine the mean differences of hypnotic suggestibility and creativity, respectively, in the different ethnic and gender groups. Results pertaining to the relation between hypnotic susceptibility and creativity, will be discussed by means of hypotheses which have been formulated with the use of the hypnotisability measure (SHSS:C), and the creativity measure (ATTA). Results regarding the relation between creativity and individual creative background will be reviewed using results of the ATTA and the biographical questionnaire.

The results of the statistical analysis conducted are presented in the following section. Whenever ANOVA was used for statistical analysis, the results were checked for homogeneity of variances with a Levene’s test.

The sample was composed as follows:

Table 1
Sample Composition

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Black</td>
<td>11</td>
<td>-</td>
</tr>
</tbody>
</table>

Note. Dash indicates that data were not obtained

As can be seen in Table 1, the sample used in this research consists of 15 white, female and 10 white, male subjects. 11 black, female students participated, but no black, male subjects were tested. The mean age was 20.2 years with an age range of 18 to 25.
Table 2
Summary of Means of Suggestibility and Creativity Test Results Regarding Gender and Ethnicity

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>White (n = 15)</td>
<td>Black (n = 10)</td>
<td>White (n = 11)</td>
<td>Black</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>SHSS</td>
<td>7.73</td>
<td>2.99</td>
<td>8.80</td>
<td>1.69</td>
</tr>
<tr>
<td>CI</td>
<td>73.22</td>
<td>15.12</td>
<td>69.03</td>
<td>11.73</td>
</tr>
</tbody>
</table>

Note. Dash indicates that data were not obtained

Table 2 summarizes the means of the SHSS and ATTA results regarding gender and ethnicity. As can be seen in Table 2, white female participants obtained mean SHSS scores of $M = 7.73$ ($SD = 2.99$), compared to black female participants with $M = 8.80$ ($SD = 1.69$) and white male participants with $M = 4.82$ ($SD = 3.31$). Regarding ATTA test results, white female participants achieved mean scores of $M = 73.22$. Black female participants obtained mean scores of $M = 69.03$ ($SD = 11.73$) on the creativity test, while white male participants attained mean scores of $M = 73.73$ ($SD = 10.07$).

Table 3 represents the results on ethnicity and suggestibility:

Table 3
ANOVA on Suggestibility and Ethnicity

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHSS</td>
<td></td>
<td>38.21</td>
<td>38.21</td>
<td>4.14</td>
<td>.05</td>
</tr>
<tr>
<td>Between Groups</td>
<td>1</td>
<td>38.21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>34</td>
<td>314.10</td>
<td>9.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
<td>352.31</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A significant difference in suggestibility was found between black and white participants ($F_{(1,34)} = 4.14$, $p \leq .05$). In this study, black people are more suggestible than white people.
In Table 4, the results on suggestibility related to ethnicity and gender are reported.

Table 4

**ANOVA on Suggestibility Between White Females and Black Females**

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHSS</td>
<td>1</td>
<td>6.83</td>
<td>6.83</td>
<td>1.04</td>
<td>.32</td>
</tr>
<tr>
<td>Within Groups</td>
<td>23</td>
<td>150.53</td>
<td>6.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No significant differences were found between white and black females \( F_{(1,23)} = 1.04, p > .05 \). There is no difference in suggestibility between black and white female subjects in the chosen sample. The hypothesis can be rejected.

The following results were obtained covering white females and males:

Table 5

**ANOVA Results on Suggestibility Between White Female and Male Subjects**

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHSS</td>
<td>1</td>
<td>53.93</td>
<td>53.93</td>
<td>5.52</td>
<td>.03</td>
</tr>
<tr>
<td>Within Groups</td>
<td>24</td>
<td>234.57</td>
<td>9.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>288.50</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A significant difference was found between white males and females concerning suggestibility \( F_{(1,24)} = 5.52, p < .05 \). The hypothesis cannot be rejected.

The relationship between creativity and suggestibility was also statistically analysed by means of regression. In Table 6, the results are summarized.
Table 6
Regression Results for the Relation Between Creativity and Suggestibility

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE B</th>
<th>ß</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>74.83</td>
<td>5.30</td>
<td></td>
</tr>
<tr>
<td>SHSS</td>
<td>-.37</td>
<td>.68</td>
<td>-.09</td>
</tr>
</tbody>
</table>

Note. $R^2 = 0.008$

Using the enter method, no significant model emerged from the regression analysis. It can be concluded that suggestibility cannot predict creativity and vice versa.

The results obtained regarding the differences between black and white students on creativity are shown in Table 7.

Table 7
ANOVA Results on Ethnicity and Creativity

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHSS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between</td>
<td>1</td>
<td>139.99</td>
<td>139.99</td>
<td>.87</td>
<td>.36</td>
</tr>
<tr>
<td>Within Groups</td>
<td>34</td>
<td>5448.27</td>
<td>160.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
<td>5588.26</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As can be seen in Table 7, black and white students do not differ on creativity ($F_{(1,34)} = .87, p > .05$).

The similar insignificant results were found between white males and females ($F_{(1,24)} = .01, p > .05$) and white and black females ($F_{(1,23)} = .55, p > .05$).
Table 8 is a summary of the regression analysis results concerning the relationship between creativity and the items on the creative background questionnaire.

Table 8  
*Regression Results for the Relation Between Creativity and Different Items on the Creative Background Questionnaire*

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>SE B</th>
<th>ß</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Constant</td>
<td>45.83</td>
<td>8.97</td>
</tr>
<tr>
<td></td>
<td>playtime</td>
<td>14.46</td>
<td>4.95</td>
</tr>
<tr>
<td>2</td>
<td>Constant</td>
<td>63.73</td>
<td>11.21</td>
</tr>
<tr>
<td></td>
<td>playtime</td>
<td>12.59</td>
<td>4.64</td>
</tr>
<tr>
<td></td>
<td>rel parents</td>
<td>-12.47</td>
<td>5.26</td>
</tr>
<tr>
<td>3</td>
<td>Constant</td>
<td>87.52</td>
<td>14.44</td>
</tr>
<tr>
<td></td>
<td>playtime</td>
<td>17.30</td>
<td>4.32</td>
</tr>
<tr>
<td></td>
<td>rel parents</td>
<td>-15.81</td>
<td>4.70</td>
</tr>
<tr>
<td></td>
<td>playtime/legos</td>
<td>-15.40</td>
<td>5.01</td>
</tr>
</tbody>
</table>

Note. Dependent Variable: CI

Using the stepwise method, three significant models emerged. Model 3 explains 54.6% ($R^2 = .546$) of the variance in creativity. That is, playtime, the relationship to parents in childhood and playing with play-dough and legos are significantly related to the level of creativity.
6.1 Discussion of results

In this study, black students were found to be more suggestible than white students (see Table 3, p. 79). This corresponds with the notion that Western culture has become too sophisticated and out of touch with organismic functioning on a deeper level (De Vos, 2005). Black people are assumed to be more in touch with their inner organismic forces and unconscious identity (Jung, cited in Hergenhahn & Olson, 2003). They are further thought to be more metaphysically inclined and more prone to suggestibility.

African cultures, as opposed to highly rationalized Western cultures, seem to be unified in their spirituality, deriving principles from symbols and myths as well as from collective rituals (Sow, cited in Meyer, Moore, & Viljoen, 1997). The African view of the person and worldview are grounded on a holistic and anthropocentric ontology (Meyer et al., 1997).

African culture rests on the survival of the community and union with nature (Meyer et al., 1997). The identity is embedded in a collective existence (Mbiti, cited in Meyer et al.). Western ideals of self-actualization are not as important to Africans as they are to Westerners. African cognitive functioning is assumed to be more intuitive, while European reasoning is viewed as analytical and discursive. Africans seem to be more connected with their physical and spiritual environments, as well as balanced use of the left and right hemisphere of the brain. Thus, they are assumed to be better equipped to reach optimal development. Western functioning is dominated by the left hemisphere, causing tension and stress (Meyer et al., 1997).

Jung’s concept of the collective unconscious may, in view of this investigation, be of interest. The collective unconscious represents the collective or ancestral experiences that human beings have had in their evolution. The archetypes that comprise the collective unconscious can be defined as an inherited predisposition to respond to certain aspects of the world. The contents of the collective unconscious are revealed in dreams, fantasies, images and symbols. Archetypes manifest themselves within social and cultural circumstances (Hergenhahn & Olson, 2003).
Jung considered the decline of the religious life among modern people to be the cause of disorientation in worldview. He assumed self-realization and individuation to be the goals of life, the ultimate integration of conscious and unconscious. Jung criticized the high value of rationalism while losing spiritual values. He described the modern world as dehumanised. “Man feels himself isolated in the cosmos, because he is no longer involved in nature and has lost his emotional “unconscious identity” with natural phenomena” (Hergenhahn & Olson, 2003, p. 87).

Jung perceived religion as one of the earliest and most universal expressions of the human mind (Jung, cited in Meyer et al., 1997). Africans seem to be very inclined in religious beliefs (Mbiti, cited in Meyer et al.), with the ancestors as intervening medium and contact with God (Sow, cited in Meyer et al.). Buhrmann (cited in Meyer et al.) assumes that ancestors represent archetypes from the collective unconscious that communicate, for instance, in hypnagogic perceptions or trance conditions.

From this more organismic viewpoint, as discussed above, it seems relevant to deduct that black people are more suggestible due to their cultural heritage and closeness to nature.

No significant correlation was found between creativity and suggestibility (see Table 6, p. 81). It can be concluded that suggestibility cannot predict creativity and vice versa. This contradicts findings that highly hypnotizable individuals are found to score higher on various creativity measures. They are believed to be able to engage in non-hypnotic trancelike experiences and to absorb in fantasy or imaginative activities (Ashton & McDonald, 1985). Krippner (1990) links suggestibility and creativity by assuming altered states of consciousness, such as hypnosis, to enhance creativity, as they are basically preverbal and unconscious in origin. Hypnosis might facilitate access to those preverbal realms. Further, absorption might be a link, as in hypnosis and in creativity the boundaries between self and environment make hypnotic experiences as well as creative activity possible (Krippner, 1990). The current study does not support the findings of Bowers (1978; 1979). The findings in this investigation correspond with Manmiller, Kumar, and Pekala’s (2005) finding that creativity is more closely linked to absorption than hypnotisability. It is further assumed that the ATTA measuring divergent thinking rather than unconscious
processes involved in creative production might not be a suitable measuring instrument for the study of the link between creativity and hypnosis.

Results regarding the differences between black and white students on creativity indicated that these two groups do not differ in creativity. This contradicts the notion that cultural factors seem to influence the course of creative development. Torrance (1969) states “that cultural factors strongly influence the course of creative development, the level of creative functioning, and the type of creative functioning that flourishes most” (p. 160). Torrance assumes that more highly developed countries stand separate from underdeveloped cultures. He argues that in more developed countries, complexity and elaboration are required for satisfactory adjustment, whereas in less developed cultures, “such complexity of thinking might be maladaptive” (Torrance, 1969, p. 160). A cross-cultural investigation on creativity found African-American students to score lower on a creativity measure than European Americans (Sapp & Hitchcock, 2003). This finding could not be confirmed in this study. No differences in creativity between black and white female subjects, and white males and black females were found.

Gender seems, besides external determinants, to function as another moderator variable regarding hypnotic susceptibility (Bowers, 1971) and creativity (Razumnikova, 2004; Van Vliet, 1995).

In this investigation, white female subjects were found to be more suggestible than white male subjects (see Table 5, p. 80). This corresponds with studies done by Bowers (1971) who found that hypnotic susceptibility, creativity, and spontaneous trance-like experiences were related only for female participants. Furthermore, only women exhibited increase in these correlations as a function of susceptibility level. Bowers (1971) reckons that sex seems to function as moderator variable in the correlates of hypnotic susceptibility. Bowers (1971) concludes that sex differences stem from basic differences in the organization of imagination. He further suggests that women's imagination is more stimulus incited, while men's imagination is more impulse driven.

The empirical findings on gender-differences in creative production are contradictory (Razumnikova, 2004; Van Vliet, 1995). For this study, the level of creativity is not
related to gender. This finding is supported by research by Van Vliet, who also found no gender differences in creativity measured by the TTCT in a South African sample. Similar insignificant results were found between white males and females, white and black females, and white males and black females.

External determinants that might be involved in creative expression include further, besides cultural factors, nonrejecting parents (Datta & Parloff, 1969), as well as balanced child-rearing style between care and letting a child explore his/her environment (Shmukler, 1982-1983). This study also found that the level of creativity is related to the relationship with the parents in childhood (see Table 8, p. 82). This finding is supported by research of Dewing and Taft (1973), who found children of parents who provided a complex and stimulating environment, and exhibited a more equalitarian childrearing style to be more creative. This finding might also support Rogers’ (1954; 1961; 1980) notion of creativity as self-actualization or self-expression. That is, children who experience unconditional love and support from their parents might be able to self-actualize and become more creative at the same time.

Another finding of this study is that the level of creativity is significantly related to the amount of time a person had for playing in childhood (see Table 8, p. 82), which can also be interpreted as giving the child the opportunity to self-actualize and, hence, express creatively. Too early interference in the natural development of the individual on the pre-school level can hamper the creativity potential of the human being (De Vos, 2005).

According to Rogers' (1954; 1961; 1980) self-theory, the actualising tendency is a dynamic force in the motivation of behaviour. But this force is inborn and much linked to the unique, creative development of the human being. Due to his humanistic viewpoint is the belief that the human can give direction to his/her own life. According to Rogers (1954; 1967; 1980), this happens from early childhood age since when a human being is born. Any judgmental interfering from significant others can hamper the process. It is interesting to see that creativity is positively associated with early-age development, especially with unstructured play-time and with parents who create a positive psychological climate (see Table 8, p. 82). It can be concluded that these research findings are in support of Rogers' (1985) idea of human development.
6.2 Shortcomings of this study
Due to several shortcomings of this study, the findings could not be generalized beyond the limits of the sample, as an ad hoc sample was used.

Small sample size and the lack of black male participants might have confounded the findings in this study. For this study, only 36 subjects were used. In order to obtain more accurate results, more research is encouraged utilizing bigger sample sizes, as well as equally distributed ethnic groups.

Another important issue to be raised is the failure to consider possible differences within a specific ethnic group, for instance Xhosa and Zulu. As Meyer et al. (1997) claim, the term African refers to a “polymorphous grouping” (p. 616) of indigenous people from diverse populations, linguistic and religious backgrounds. For future research, it would be interesting to look at differences within different sample groups more closely.

It would also have been important to take motivation, needs, and motives of the subjects into consideration. Future researchers should pay attention to several situational variables such as subject-hypnotist relationship, and subject motivation and attitude (Udolf, 1987). For this research, the affective states of the subjects, such as test anxiety, or being uncomfortable with the test situation, might have confounded the findings. In future studies, those factors should be controlled for.

Regarding suggestibility, it might be possible that subjects in this study cannot be compared with each other as the same score does not necessarily mean that the person passed the same items and it might not explain the same underlying psychological processes.

It must also be noticed that suggestibility is a very subjective experience which cannot be measured without using an individual’s verbal report. Hence, there is also a qualitative element in the study of hypnotic susceptibility that should have been taken into consideration.
Noteworthy for this research is also that many participants had difficulties understanding the instructions for the ATTA. This caused uncertainty in the subject, which might have led to lower test scores for creativity. The tests used were not given in the participants’ native language and concepts might not have been understood by some subjects. The understanding of instructions is, however, essential in order to be able to complete the test. For future research, this is another point to be taken into consideration. Furthermore, the ATTA was standardized within the Western paradigm and it may not be appropriate for testing black cultures of South Africa.

Nevertheless, it is hoped that this research has been of heuristic value and has contributed in some measure to the understanding of the complex phenomena of creativity and hypnosis. This research was aimed to be an inspiration for researchers in these interesting and important aspects of human functioning.

6.3 Recommendations for future research
As mentioned earlier, the concepts of creativity and suggestibility are understood in different ways by various investigators. Therefore, this study aims to facilitate further research on these important, but neglected areas of psychology.

In light of the findings of this study regarding cross-cultural differences in suggestibility, it is recommended that further investigations should follow on this same topic, but using much larger sample sizes. It is important to understand the principles underlying different cultures' psyche and cognitive processes.

The same holds true for creativity. It is the researcher’s opinion that the ATTA is a westernised test on creativity and may not suit the black cultures of South Africa. There is a need for a standardized test on creativity. Future research in this context should take indigenous languages, such as Xhosa and Zulu, into account when administering theses tests.
REFERENCES


APPENDIX A

Questionnaire on individual creative background

Please answer the following biographical questions. Mark your preferred answer with an x or fill in.

Gender :  o male  o female
Age : _________ years
Which best describes you?  o white     o coloured         o black  o other
What describes your socio-economic background best?  o high          o middle  o low

This is a questionnaire about the relationship between biography and suggestibility/creativity. Please bear in mind that this questionnaire refers to circumstances in your childhood.

Please answer every of the following questions. Mark your preferred answer with an x.

1.  Do you have siblings? If so, how many brothers or sisters do you have? How old are they?
   o  No
   o  Yes

   ________ brothers; age: ________
   ________ sisters; age: ________

2.  Do you have a close relationship to your siblings?
   o  No
   o  Yes

3.  How was the relationship to your parents in your childhood?
   o  Good relationship
   o  Many conflicts

4.  Did your parents encourage you to read books?
   o  No
   o  Yes

5.  Did your parents regularly tell you stories when you were a child?
   o  No
   o  Yes
6. Did you have a lot of regular activities such as sport clubs, playing an instrument, etc.?
  o No
  o Yes
  If so, did you still have a lot of time to play?
  o No
  o Yes

7. Did you often play with playdough, legos, blocks, etc.?
  o No
  o Yes

8. Did you play an instrument or did you sing songs together at home?
  o No
  o Yes

9. Did you often draw or paint when you were a child?
  o No
  o Yes

10. How would you describe your parents’ child-rearing style?
    o Authoritative
    o Laissez-faire
    o Authoritarian

11. Did your parents encourage you to be independent?
    o No
    o Yes

12. Did your parents consult with you and explain family decisions to you?
    o No
    o Yes