Hypnotic Susceptibility and Mentalization Skills in the Context of Parental Behavior

Theses of Doctoral (PhD) Dissertation
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Budapest, 22 June 2015
1. INTRODUCTION

ALTHOUGH THE “Nature versus Nurture” debate seems to be unsettled, most scholars agree that childhood social experiences have a deep impact on our adult psychological functioning (e.g., Plomin & Bergeman, 1991). Since the seminal work of Bowlby (1969) on attachment, many pieces of empirical evidence were found for that our relationship with our primary caregivers largely determine our ability to relate to others and create close bonds with others. The basic form of attachment is the mother-infant relationship, but in later phases of our lives, the affectional bond (Bowlby, 1979/2005) with our parents can still be a resource for comfort, care and support. The parents’ behavior towards the child can be classified based on the emotional responsiveness (“cold” or “warm”) and the level of demandingness (“controlling” or “permissive”) (Baumrind, 1967; Maccoby & Martin, 1983).

The way a parent treats a child has great bearings on the child’s capacity for mentalization. Mentalization is essential in organization of the self, in understanding one’s own and others’ emotions, and in relating to other people. It is the ability to interpret interpersonal behavior in terms of mental states. The well-adjusted parent is able to give adequate feedback to the child through the mechanisms of mirroring and labeling the child’s emotional states: This is how we learn to mentalize (Fonagy, Gergely, Jurist, & Target, 2002). Therefore, it seems obvious that the caring and nurturing parent can be a basis for the child to practice and develop adequate mentalizing.

The emotionally distant parent who cannot give adequate feedback about the child’s reactions or who is restrictive about them cannot create a safe environment for the acquisition of mentalization capacities. Symbolic capacity and mentalizing ability of children is largely predicted by the style their parents treat them during play (Keren, Feldman, Namdari-Weinbaum, Spitzer, & Tyano, 2005). Mentalization is a multidimensional phenomenon, including lexicithymia (being able to identify and express one’s own emotions), empathy, emotional contagion, mind-reading, understanding irony, and many other facets (Luyten, Fonagy, Lowyck, & Vermote, 2012). So far, primarily the cognitive components of mentalizing have been investigated, although it also has an affective dimension (Fonagy & Target, 2003).

The same tendency can be observed in the development of hypnosis theories: Until recently, most scholars addressed the cognitive and the neural aspects of hypnotic state, and just a few models emphasized its affective nature (Bányai, 1998; Woody & Szechtmans, 2007; Nash, 2008). It seems logical that those people will be highly responsive to hypnosis who show high levels of interpersonal orientation, optimally functioning Theory of Mind (a concept similar to mentalization) (Bonshtein, 2012), and are able to empathize with others (Wickramasekera, 2015). Empirical evidence suggests that hypnotic susceptibility is associated with empathy (Wickramasekera & Szlyk, 2003), and to emotional contagion (Cardeña, Terhune, Lööf, & Buratti, 2009). Emotional contagion is our propensity to automatically take and mimic the affective expressions of other people (Hatfield, Cacioppo, & Rapson, 1994). The social-psychobiological model suggests that hypnosis is an altered state of consciousness,
which emerges from the interaction of the hypnotized person and the hypnotist (Bányai, 2008). In this model, hypnotic responsiveness is the level of behavioral, emotional, phenomenological, and neurophysiological flexibility the hypnotized person shows in the hypnotic situation. It seems a logical consequence of the social-psychobiological concept and other emotion-oriented models that hypnosis can occur only if the participants are able to detect and process each other’s mental states, and act upon them. In other words, hypnosis seems to be related to mentalization.

This notion is supported by the fact that both phenomena have developmental antecedents. As I mentioned above, mentalizing skills are associated with warm, caring (and playful) parental behavior. From the qualitative research of J. R. Hilgard (1970) we know that more developmental “pathways” can lead to high adult hypnotic susceptibility. The children of warm and supportive parents may identify with the parents’ dissociative involvement in pleasant activities; therefore s/he will be able to be engaged in hypnotic altered state of consciousness in her/his adulthood. The children of cold, rejective and frequently punishing parents, on the other hand, may learn to use dissociative strategies to “escape from reality”, as a defense mechanism. Thus, these children will also be able to show dissociation (and high hypnotic capacity) in hypnosis in adults, but as opposed to the children of warm-supportive parents, hypnosis may be a fearful and negative situation for them. Although the “multiple pathways” theory has some empirical evidence (Rhue, 2004), its quantitative investigation was missing from the literature. Preliminary findings of our research team showed that cold, overprotective and punishing parental behavior is associated with hypnosis (Költő, 2008; Heller, 2011), but it remained a question whether the parental styles described by Baumrind and Maccoby and Martin differentiate along hypnotic responsiveness.

The above mentioned results about the association between behavioral hypnotic susceptibility and empathy and emotional contagion also support the notion that hypnotic and mentalizing capacities are related. These investigations, however, did not cover the variation of emotional and the phenomenological responses to hypnosis. Besides the behavioral aspect, emotional and phenomenological dimensions of hypnotic response (Shor, 1962) should also be taken in consideration.

A third group of evidence that support the association between hypnotic responses and mentalization involves neurophysiological, neuroendocrine, and psychogenetic investigations. Both mentalization and hypnosis are very complex phenomena. They do not have one distinct “center” in the brain, but they are rather diverse neurosignatures emerging from synchronized cortical and subcortical activity. They are, nevertheless, highly overlapping. Both in hypnotic interactional synchrony and mentalizing, the mirror neuron system (Gallese, Fadiga, Fogassi, & Rizzolatti, 1996) seems to have an essential role. Another important link is the joint activity of the prefrontal (PFC) and the anterior cingulate cortices (ACC). These, in mentalization, play a role in monitoring others’ and one’s own actions, making predictions about others’ future behavior, recognizing similarity to and dissimilarity from us, emotional valence of verbal expressions, and trueness or falseness of beliefs (Frith & Frith, 2006). These areas show high functional connectivity (in everyday waking state) in high hypnotiz-
ables, but not in low hypnotizables; according to Hoeft et al. (2012), this may be the reason why highly susceptible people are better in filtering the stimuli from the external world and adapting to changes in interpersonal situations. These mechanisms are also influenced by parental behavior: It seems that the parental re-orienting of the infant’s attention to external stimuli contributes to an increased activity in the ACC (Posner & Rothbart, 2011), which has large impact on adult hypnotic response. The third neural similarity is the dominance of the right hemisphere in both hypnotic state and mentalizing activities. “Good mentalizers” and high hypnotizables seem to be better in integrating right and left hemispheric information. This ability is reduced in alexithymic people (Bermond, Vorst, & Moormann, 2006); hypnotherapy may help them to re-connect the two hemispheres, and find the missing verbal labels for their suppressed emotions (Bányai, 2006).

Both hypnotic capacity and mentalization seem to be partly determined by the genetic variation of the Catechol-O-Methyltransferase (COMT) enzyme. COMT metabolizes dopamine in the central nervous system, thus plays a role in sustained attention and many emotional processes. Although the results are not unequivocal, it seems that certain COMT genotypes are associated with high hypnotizability (Szekely et al., 2010) and better mind-reading performance (Lackner, Sabbagh, Hallinan, Liu, & Holden, 2012). A high level of the neuropeptide oxytocin also seems to be related to hypnotic capacity and mentalization (Varga & Kekecs, 2014; MacDonald & MacDonald, 2010), and this association is also determined by the quality of attachment (Zelinka, Cojan, & Desseilles, 2013).

The above listed findings drove me to formulate the following thesis:

*Both the hypnotized subject(s) and the hypnotist must be able to perceive, recognize, and identify (“read”) their own and the other person’s expectations, motives, and emotional states in order to construct hypnotic interaction. This is also a prerequisite for the subject to experience an alteration of consciousness under hypnosis. Hypnosis therefore can be interpreted as a product or a derivative of mentalization, and it depends on the participants’ inter- and intrapersonal mentalization skills. As these skills are established in the context of attachment, affectional bonds, and socialization, the behavior of the parents towards the child influences the child’s adult responses to hypnosis through the development of her or his mentalization abilities.*

The aim of my doctoral dissertation was to examine the triangular association among parental rearing style, mentalizing skills and hypnotic response. In my opinion, a better understanding of their relation may also help us in planning and carrying out hypnototherapeutic interventions. It seems logical that if hypnosis and mentalizing skills are related, specific hypnotic suggestions and the holding, secure, and affirmative environment in hypnotherapy may help the client restore and practice damaged mentalizing skills. This may be especially helpful for alexithymic patients who have difficulties in mentalizing their own emotional states (Költő & Bányai, 2015).
2. RESEARCH QUESTIONS AND HYPOTHESES

FOLLOWING THE TRIANGULAR argumentation outlined above, I hypothesized that specific sub-skills of mentalizing (reading the mind from the eyes, propensity for emotional contagion and lexithymia) will be related to the behavioral, emotional and phenomenological dimensions of hypnotic response. I also expected that these will be influenced by memories of parental behavior. Mentalizing skills may mediate between parental style and hypnotic response: Those who recall warm and supportive parents may demonstrate higher hypnotic involvement because they got adequate “input” from their parents to become good mentalizers.

The thesis has two additional (methodological) aims. First, I wanted to test whether online administration of the measures on parental behavior and mentalizing skills are comparable to earlier, paper-and-pencil data. Second, in the hypnosis literature, the investigation of the effect of possible contextual variables (like the gender, the age and the profession of the subject, or the person of the experimenter) is missing (Kihlstrom, 2008), therefore I included these in the data analysis.

**Question 1**

Are memories of parental rearing associated with mentalization sub-skills (including reading the mind in the eyes, emotional contagion, and lexithymia)?

**Hypothesis 1a**

I expect that a set of different sub-dimensions of mentalization is related to certain parental behaviors, namely, it will show a positive correlation with recalled parental warmth and negative correlations with parental rejection and overcontrolling behavior, irrespective of the subject’s gender or that of the parent.

**Hypothesis 1b**

I hypothesize that those Ss will show the best mentalizing abilities who recall warm-supportive (either authoritative or permissive) parents. Those Ss who remember their parents as cold, not supportive, or highly controlling, will demonstrate worse performance on the tests of mentalizing skills.

**Question 2**

How are the memories of parental rearing style related to the dimensions of hypnotic susceptibility?

**Hypothesis 2a**

Earlier empirical findings (obtained mainly with qualitative techniques) suggest that warm-loving parental rearing style and cold-controlling behavior may lead to the child’s high hypnotizability in her or his adulthood. I expect that these relationships can be verified by quantitative investigation: Individuals, who recall their parents from their childhood as having relatively high emotional warmth, or high rejection, or overcontrolling, will be more hypnotizable than those Ss who evaluate their parents to be closer to average scores in emotional warmth and/or control.
Hypothesis 2b Based on theories and clinical observations it can be hypothesized that those Ss who recall warmer and more caring parents will show more positive archaic involvement to the hypnotist, while the more cold and rejective parents they recall, the less positive their emotional bond towards the hypnotist will be.

Hypothesis 2c Qualitative findings suggest that children of both warm-supportive parents and cold-controlling or rejective parents will tend to be highly hypnotizable adults, but their feelings of hypnosis may differ. I hypothesize that such differences will be reflected in their phenomenological experiences: The former group will have more positive experiences under hypnosis, while the latter will have more negative feelings.

Question 3 Is hypnotic susceptibility, as assessed by the Ss’ performance on standardized test suggestions, related to mentalization skills?

Hypothesis 3a Since hypnotic responding requires the S to perceive and understand the H’s expectations and suggestions (that are “expressions” of a specific mental state of the H), I expect hypnotic behavior to be associated with facets of mentalization.

Hypothesis 3b Based on previous findings in the literature, I expect that the behavioral dimension of hypnotic susceptibility will show a linear association with emotional contagion, and a quadratic relationship with alexithymia.

Question 4 Are the S’s transference emotions towards the H and emotional involvement in the hypnotic situation related to her or his mentalizing ability?

Hypothesis 4 Given that those who have good mentalization skills may feel less stressed and confused about interpersonal situations than those for whom mentalization is difficult, I expect mentalizing ability to be associated with feeling positively about the hypnotist and the hypnosis itself.

Question 5 Is mentalizing ability associated with specific patterns in the phenomenology of ASC experienced under hypnosis?

Hypothesis 5 I hypothesize that Ss with better mentalizing skills will report more positive feelings about being in ASC.

Question 6 Do mentalization skills mediate the relationship between parental behavior and hypnotic responding?

Hypothesis 6 I hypothesize that while parental rearing style directly influences hypnotic response, this effect will be partially or fully mediated by mentalizing skills. While both positive and negative parental behavior can lead to stronger hypnotic responses, I expect that parental
warmth partly results in increased hypnotic susceptibility through the mediation of good mentalization ability (e.g., lexithymia, which is reflected in negative regression coefficients in the parental rearing → lexithymia and lexithymia → hypnotizability links). On the other hand, negative aspects of mentalization (e.g., alexithymia) may mediate between cold-controlling, rejective or punishing parental behavior and increased behavioral hypnotizability.

**Question 7**  
Are data on parental rearing and mentalization that are collected via an online survey tool comparable with those administered as paper-and-pencil tests in the laboratory?

**Hypothesis 7**  
Based on empirical findings and methodological papers, I expect that the My Memories of Upbringing (EMBU), the Emotional Contagion Scale (ECS), the Toronto Alexithymia Scale (TAS-20), and the Reading the Mind in the Eyes Test (RMET) administered via the Internet will lead to data comparable to earlier observations carried out with using paper-and-pencil tests administered in laboratory environments.

**Question 8**  
Do the experimenter variables have an effect on the subjects’ hypnotic response?

**Hypothesis 8**  
I expect that these variables will influence the emotional bond to the hypnotist, but will barely influence the behavioral and phenomenological aspects of the hypnotic response, if at all.
3. SAMPLE AND METHODS

THE HEADCOUNT OF SUBJECTS was determined by a priori analysis of statistical power. The analysis stipulated that $N \approx 200$ would be appropriate. Due to the experimental design, however, 565 participants were tested for their hypnotic capacity. A part of them responded to an online test battery, including a questionnaire on parental behavior and three tests of mentalizing skills. As you can see in Table 1, they represented various age groups. Of all subjects, 459 gave information about their profession; as you can read from Table 2, a large proportion of them were psychologists (under this term I mean both psychology students and graduated professionals) or healthcare provider, but other professions were also represented. Psychologists may be a “biased” sample to testing mentalization, as they are necessarily trained to deal with their emotions. They also show higher hypnotizability than non-psychologists (Költő, Gősi-Greguss, Varga, & Bányai, 2015). That was one reason for not administering the measures of parental behavior and mentalizing skills to them.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Age distribution of the sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group</td>
<td>Freq.</td>
</tr>
<tr>
<td>18–20</td>
<td>112</td>
</tr>
<tr>
<td>21–24</td>
<td>224</td>
</tr>
<tr>
<td>25–28</td>
<td>104</td>
</tr>
<tr>
<td>29–32</td>
<td>41</td>
</tr>
<tr>
<td>33–36</td>
<td>26</td>
</tr>
<tr>
<td>37–40</td>
<td>17</td>
</tr>
<tr>
<td>(41–50)</td>
<td>20</td>
</tr>
<tr>
<td>(51–68)</td>
<td>21</td>
</tr>
<tr>
<td>Total</td>
<td>565</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Profession of the subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profession</td>
<td>Freq.</td>
</tr>
<tr>
<td>Psychology/Healthcare</td>
<td>141</td>
</tr>
<tr>
<td>IT/Engineering</td>
<td>80</td>
</tr>
<tr>
<td>Economy/Commerce</td>
<td>68</td>
</tr>
<tr>
<td>Legal/Administrative</td>
<td>43</td>
</tr>
<tr>
<td>Culture/Science</td>
<td>76</td>
</tr>
<tr>
<td>Other</td>
<td>51</td>
</tr>
<tr>
<td>Total</td>
<td>459</td>
</tr>
</tbody>
</table>

The subjects were recruited with a combination of convenience sampling and chain referral (snowball method). Criteria of inclusion were 18 years of age or older, and being mentally and somatically healthy. The subjects were contacted via e-mail, and first some of them were asked to fill in the online test battery. This included the following tests. The *My Memories of Upbringing* (‘Egna Minnen Beträffende Uppfostran’, *EMBU*) questionnaire was created by Arrindell et al. (1999) (they also introduced the Hungarian version), which measures Rejection, Emotional Warmth, and (Over)protection of the father and the mother. For operational reasons, I developed a fourth factor, including items of the Overprotection and Rejection subscales, named Punishment. Three questions were added before the original 23 items, tapping into the intactness of the family structure and the primary caregiver(s) of the subject; 4 additional questions after the 23 items addressed the love for the father and the mother. The *Reading the Mind from the Eyes Test* (*RMET*) was developed by Baron-Cohen, Wheelwright, Hill, Raste, and Plumb (2001), and adapted to Hungarian by Ivády.
Takács, and Pléh (2007). It consists of 36 black and white photographs of human eye regions, expressing a complex mental state. These are presented one by one, each with four adjectives, one of which is the “target” and the other three are “distractors” (giving false description of the given mental state). The subject has to decide which adjective describes the best the photographed person’s mental state. The Emotional Contagion Scale (ECS) (Doherty, 1997) is a questionnaire of 15 items that taps into how much the respondent automatically mimics and feels others’ emotions. The Hungarian version of the questionnaire was developed for the present thesis. The items belong to two subscales, for positive and negative emotions. Finally, the online test battery included the 20-item version of the Toronto Alexithymia Scale (TAS-20) (Bagby, Parker, & Taylor, 1994). The Hungarian version was published by Cserjési, Luminet, and Lénárd (2007). It is a self-report questionnaire, with items organized in three factors. They are Difficulty in Identifying Feelings, Difficulty in Describing Feelings, and Externally Oriented Thinking.

In the first part of the investigation, the Ss filled in this battery in an online survey system (http://www.kerdoivem.hu). Hypnotizability testing took place approximately 2-3 weeks after administration of the online questionnaires. The Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A) (Shor & Orne, 1962) was administered to the subjects, according to standard instructions. The Hungarian standard of the HGSHS:A was prepared in the frames of my PhD research project (Költő et al., 2015), based on the adaptation by Greguss, Bányai, Mészáros, Csókay, and Gerber (1975), and the data accumulated in our laboratory since the adaptation was done (Költő, Gösi-Greguss, Varga, & Bányai, 2014). Following the HGSHS:A, the Ss filled in two questionnaires. The Archaic Involvement Measure (AIM) was developed by Nash and Spinler (1989), and adapted to Hungarian by Horváth, Bányai, Varga, Gösi-Greguss, and Vágó (1988). It contains 19 items tapping into positive emotions towards the hypnotist, and 3 items on the negative transference. The positive items are organized into three subscales: Admiration and bonding to the hypnotist; Fear of negative appraisal [by the hypnotist]; and Need for dependence. The last measure the subjects responded to was the Phenomenology of Consciousness Inventory (PCI) (Pekala, 1991), adapted to Hungarian by Szabó (1993). It contains 53 items which tap into the various experiences related to altered states of consciousness. Originally, these are organized into 12 first-order and 14 second-order subscales, but for operational purposes, a 5-factor solution was later developed by Kumar, Pekala, and Cummings (1996). These are Dissociative Control, Positive Affect, Negative Affect, Visual Imagery, and Attention to Internal Processes.

Due to the above mentioned reasons, the following number of Ss responded to the questionnaires: 243 Ss filled in the EMBU regarding their mother; 230 responded to the EMBU respective to the father; 360 Ss responded to RMET; 362 filled in the ECS, and 298 of them filled in TAS-20. The number of subjects who responded to all online measures and participated in hypnosis (in the following, this group will be referred to as core sample) was 191. The Ss did not receive money or any other form of remuneration for their participation. The investigations were carried out in compliance with the Ethical Code of the Hungarian Psychological Association.
Figure 1 lists the phases of statistical analysis. First, descriptive data were calculated for each measure and their subscales. These, if possible, were compared to Hungarian or other standards. Cronbach alpha values were calculated to check the reliability of the subscales. Differences across genders, professions (and for hypnosis-related measures, hypnotists) were tested with parametric or nonparametric tests. Then Confirmatory Factor Analysis (CFA) was conducted for each measure, to check whether the present data fit the previously set factor solutions. Associations between the variables were tested with Pearson correlations and linear and nonlinear regression analysis. To test whether parents can be classified based on their rearing behavior, a K-means cluster analysis was conducted on the EMBU subscales. Mentalizing skills and hypnotic responding across the clusters were compared with one-way and multiple ANOVA, with post hoc tests. Finally, to check whether mentalization skills mediate between parental rearing style and hypnotic responding, mediation analyses were conducted. Besides significance level, effect sizes and statistical power were calculated for all statistical tests. The analyses were carried out with SPSS 19.0 and AMOS 22 softwares. Statistical power was computed with the G*Power 3.1 software (Faul, Erdfelder, Lang, & Buchner, 2007). Effect sizes were calculated either manually or with Becker’s (http://www.uccs.edu/lbecker/index.html#means_and_standard_deviations) online effect size instrument. Significance level for all analyses was set at .05, two-tailed. Confidence intervals are given for 95% level. Due to the large number of comparisons, to prevent the inflation of familywise Type I error rate, significance levels of the respective tests were adjusted using Holm-Bonferroni procedure (Holm, 1979).
4. KEY FINDINGS

CONFIRMATORY FACTOR ANALYSES and Cronbach alpha values suggested that the measures demonstrated appropriate structural validity and reliability. Mean scores and standard deviations were, in general, comparable to reference samples. To check Hypothesis 7—where it was possible—I contrasted the results to earlier paper-and-pencil and online data; no significant or exceeding small-effect differences were found, which supports that the online versions of EMBU, ECS, RMET and TAS-20 are acceptable alternatives to paper-and-pencil testing.

4.1. Analysis of Associations
After checking single correlations, multiple linear regressions were conducted to check whether mentalizing skills (Hypothoses 3a, b, 4 and 5) and background variables (Hypothesis 8) have an effect on the behavioral, emotional and phenomenological dimensions of hypnotic response. The results of the regression analyses are summarized in Table 3.

Table 3 | The summary of multiple regression analyses: Effect of mentalizing skills and background variables on hypnotic response

<table>
<thead>
<tr>
<th>Outcome variable</th>
<th>Predictors ($\beta$)</th>
<th>$f^2$</th>
<th>adj. $R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>HGSHS:A Observer-scores</td>
<td>TAS-20 Difficulty in Identifying Feelings ($-.17$) ECS Total ($-.17$)</td>
<td>.059</td>
<td>5.6%</td>
</tr>
<tr>
<td>HGSHS:A Self-scores</td>
<td>TAS-20 Difficulty in Identifying Feelings ($-.18$) ECS Total ($-.14$)</td>
<td>.051</td>
<td>4.9%</td>
</tr>
<tr>
<td>AIM Positive</td>
<td>ECS Total ($-.20$) Age ($-.14$) TAS-20 Difficulty in Identifying Feelings ($-.13$)</td>
<td>.081</td>
<td>7.5%</td>
</tr>
<tr>
<td>AIM Negative</td>
<td>TAS-20 Difficulty in Identifying Feelings ($-.23$) Age ($-.22$) Psy or Non-Psy ($-.13$)</td>
<td>.123</td>
<td>11.0%</td>
</tr>
<tr>
<td>AIM Admiration and Bonding</td>
<td>ECS Total ($-.21$)</td>
<td>.042</td>
<td>4.0%</td>
</tr>
<tr>
<td>AIM Fear of Negative Appraisal</td>
<td>Age ($-.20$) TAS-20 Difficulty in Identifying Feelings ($-.19$)</td>
<td>.083</td>
<td>7.7%</td>
</tr>
<tr>
<td>PCI-5 Dissociative Control</td>
<td>Age ($-.47$) TAS-20 Difficulty in Identifying Feelings ($-.38$)</td>
<td>.084</td>
<td>7.8%</td>
</tr>
<tr>
<td>PCI-5 Positive Affect</td>
<td>TAS-20 Pragmatic Thinking ($-.21$)</td>
<td>.044</td>
<td>4.2%</td>
</tr>
<tr>
<td>PCI-5 Negative Affect</td>
<td>TAS-20 Difficulty in Identifying Feelings ($-.26$) Psy or Non-Psy ($-.23$)</td>
<td>.200</td>
<td>16.7%</td>
</tr>
<tr>
<td>PCI-5 Attention to Internal Processes</td>
<td>TAS-20 Difficulty in Identifying Feelings ($-.51$) Total Score ($-.46$) Age ($-.15$)</td>
<td>.140</td>
<td>12.3%</td>
</tr>
</tbody>
</table>

Note. $\beta$ = Standardized regression coefficients; $f^2$ = Cohen’s effect size $f$ squared; Adj. $R^2$ = explained variance; Psy or Non-Psy = A binary professional variable coding whether the subject was a psychologist or not. All regressions and the separate effect of all predictors were significant ($p < .041$); all regressions had a statistical power exceeding .80.
You can see in Table 3 that alexithymic emotional processing and propensity for emotional contagion have a significant effect on hypnotic variables, although the effect (indicated by effect size $f^2$ values) rarely exceed .15, which would have indicated medium effect (Cohen, 1977). Nevertheless, it seems that those who have difficulties in identifying their feelings tend to be less involved in the hypnotic situation, feel more negatively about the hypnotist, and express fear that the hypnotist will be dissatisfied with them. Those who were prone to automatically mimic others’ emotions were more hypnotizable and expressed more positive transference towards the hypnotist. Alexithymia was associated with negative experiences in hypnosis and inwards attention; interestingly, those who showed more alexithymia felt more negative, but also paid more attention to her or his internal world under hypnosis. Age and profession (being or not being a psychologist) also acted as a predictor for some outcome variables.

The effect of parental behavior (Hypotheses 1a, 2a, b) and background variables (Hypothesis 8) on mentalizing skills and dimensions of hypnotic response were also investigated with multiple regression. The results are summarized in Table 4.

### Table 4 | The summary of multiple regression analyses: Effect of parental behavior and background variables on mentalizing skills and hypnotic response

<table>
<thead>
<tr>
<th>Outcome variable</th>
<th>Predictors ($\beta$)</th>
<th>$f^2$</th>
<th>adj. $R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECS Negative</td>
<td>Gender (.45)</td>
<td>.307</td>
<td>23.5%</td>
</tr>
<tr>
<td></td>
<td>Paternal Punishment (.17)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Age (.15)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAS-20 Total</td>
<td>Paternal Overprotection (.21)</td>
<td>.094</td>
<td>8.6%</td>
</tr>
<tr>
<td></td>
<td>Age (−.18)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Psy or Non-Psy (.17)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAS-20 Difficulty in Identifying Feelings</td>
<td>Paternal Overprotection (.17)</td>
<td>.122</td>
<td>10.9%</td>
</tr>
<tr>
<td></td>
<td>Age (−.21)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mother Punishment (.15)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AIM Positive</td>
<td>Paternal Punishment (.20)</td>
<td>.059</td>
<td>5.6%</td>
</tr>
<tr>
<td></td>
<td>Age (−.14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AIM Negative</td>
<td>Age (−.22)</td>
<td>.094</td>
<td>8.6%</td>
</tr>
<tr>
<td></td>
<td>Maternal Punishment (−.22)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AIM Fear of Negative Appraisal</td>
<td>Age (−.24)</td>
<td>.156</td>
<td>13.5%</td>
</tr>
<tr>
<td></td>
<td>Maternal Punishment (.21)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paternal Punishment (.13)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCI-5 Negative Affect</td>
<td>Maternal Punishment (.21)</td>
<td>.104</td>
<td>9.5%</td>
</tr>
<tr>
<td></td>
<td>Psy or Non-Psy (−.19)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Age (−.13)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCI-5 Attention to Internal Processes</td>
<td>Age (−.20)</td>
<td>.059</td>
<td>5.6%</td>
</tr>
<tr>
<td></td>
<td>Maternal Overprotection (.14)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. $\beta =$ Standardized regression coefficients; $f^2 =$ Cohen’s effect size f squared; Adj. $R^2 =$ explained variance; Psy or Non-Psy = A binary professional variable coding whether the subject was a psychologist or not. All regressions and the separate effect of all predictors were significant ($p < .043$); all regressions had a statistical power exceeding .86.
As Table 4 shows, the development of the operational Punishment factor was justified by the results: It was one of the predictors of many outcome variables. The results of the analyses suggest that being a woman, being frequently punished by the father, and being older significantly increases the propensity for automatic mimicking of negative emotions. The effect is medium-sized. Paternal Overprotection, Maternal Punishment (younger) age and not being a psychologist predicts alexithymic emotional processing and within that, difficulty in identifying feelings to a small extent. Interestingly, the punitive behavior of the parents contributes to both positive and negative feelings towards the hypnotist, which may be a sign of the ambivalence in the relationship with the hypnotist as an authority figure. Punishment from both parents positively predicts the fear of the subject that the hypnotist will be displeased with her or his hypnotic performance. Negative experiences and inward attention is predicted by age, profession, and maternal punishment / overprotection to a small extent.

4.2. Clusters of Parental Behavior
A large-sample investigation of school children (Pereira, Canavarro, Cardoso, & Mendonça, 2009) verified that parents, based on the cluster analysis of EMBU scores, can be classified into categories that correspond with the theoretical classes in the model of Baumrind, and Maccoby and Martin. A K-means cluster analysis resulted in 4 factors similar to the Portuguese findings and the theoretical groups, although instead of cold-controlling and cold-permissive groups, a category of “average-controlling” parents and a “cold-distant” (but not too much controlling) group of fathers emerged. The clusters and the proportion of parents falling into each cluster can be found in Table 5.

<table>
<thead>
<tr>
<th>Fathers</th>
<th>n</th>
<th>%</th>
<th>Mothers</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warm-Supportive</td>
<td>103</td>
<td>44.8</td>
<td>Warm-Supportive</td>
<td>118</td>
<td>48.0</td>
</tr>
<tr>
<td>Cold-Permissive</td>
<td>83</td>
<td>36.1</td>
<td>Cold-Permissive</td>
<td>58</td>
<td>23.6</td>
</tr>
<tr>
<td>Average-Controlling</td>
<td>27</td>
<td>11.7</td>
<td>Average-Controlling</td>
<td>37</td>
<td>15.0</td>
</tr>
<tr>
<td>Cold-Distant</td>
<td>17</td>
<td>7.4</td>
<td>Cold-Controlling</td>
<td>33</td>
<td>13.4</td>
</tr>
<tr>
<td>Total</td>
<td>230</td>
<td>100</td>
<td>Total</td>
<td>246</td>
<td>100</td>
</tr>
</tbody>
</table>

In Hypothesis 1b, I expected that children of warm-supportive parents would demonstrate the best mentalizing abilities. I hypothesized (2c) that both warm-supportive and cold-controlling or cold-rejective parental styles would be associated with higher hypnotic susceptibility, but with different emotions and experiences in hypnosis. No significant or over small cluster difference was found for RMET or ECS scores. Paternal styles had a mediocre effect on their children’s mentalization skills or hypnotic responses. It turned out, however, that the children of cold-distant fathers exhibited less externally oriented (pragmatic) thinking and higher hypnotizability (as measured by an external observer) than those who recalled other types of fathers. Men with average-controlling fathers felt more negative about the hypnotist and expressed more fear that the hypnotist would not like him than women did. The children of aver-
age-controlling mothers (regardless of their gender) scored highest on TAS-20 Difficulty in Identifying Feelings, and they had the most negative experiences in hypnosis. In general, some differences were observed around parental clusters, which shows that those parents who were perceived as strict and emotionally not very responsive—or even cold—, evoked disturbances in mentalization skills (as seen in TAS-20 Difficulty in Identifying Feelings), and somewhat higher involvement in hypnosis. The effect sizes associated with these differences were, however, rather small.

4.3. Mediation Analysis
Although I expected that clusters of parental style would better predict them than single dimensions of parental behavior, comparison of the effects in regression analyses, the single elements showed somewhat more and stronger predictive power. To some extent, all three constructs showed some association, as measured by regression. Standardized regression coefficient betas around or over .20, in an interplay with gender, age, and being or not being psychologist, suggested a causal link between punishing and overprotective behavior of the parents; difficulty in identifying feelings, and overall alexithymia; negative aspects of archaic involvement towards the hypnotist, and negative feelings (and increased inward attention) under hypnosis. To check Hypothesis 6, mediation analyses were conducted, following the method of Baron and Kenny (1986), involving the above mentioned causal links.

Six robust mediation effects were found. Both fathers’ and mothers’ punishing behaviors seemed to influence negative emotions towards the hypnotist, the fear that the hypnotist would be displeased by the Ss’ hypnotic performance, and negative affects associated with hypnotic altered state of consciousness. All of these effects were mediated by the Ss’ alexithymic affective processing, i.e., the difficulty s/he perceived in identifying her or his emotions.

Difficulty in accessing and recognizing one’s own emotions fully mediated the punishment → negative archaic involvement pathway, involving that of paternal (Figure 2) and maternal (Figure 5) punitive behavior. Those Ss who where more frequently punished felt slightly more negative transference towards the hypnotist, but if alexithymic processing was taken in account, it turned out that the effect is transmitted by that children recalling more punishment, are generally more confused about their feelings.

Children recalling more punishment (from their fathers and mothers) reported more fear of the hypnotist’s negative appraisal. Controlling the effect for TAS-20 Difficulty in Identifying Feelings scores revealed that this effect is partially mediated by alexithymic emotional processing (fathers: Figure 3, mothers: Figure 6).

Parental punishment was also associated with the general negative feelings under hypnosis. The association was fully mediated by alexithymic processing for the punishment from the fathers (Figure 4); difficulty in emotional processing was a partial mediator between maternal punishment and negative experiences in hypnosis (Figure 7).
**Figure 2** | TAS-20 Difficulty in Identifying Feelings fully mediates the Paternal Punishment → AIM Negative link. Sobel's \( z = 2.632, p = .008 \), standardized indirect effect = .059, mediation = 61.6%. 
*Note.* \( ^* p < .05 \). \( ^** p < .005 \).

\[ \beta_a = .223^{**} \quad \beta_b = .265^{**} \quad \beta_c = .137^{*} \quad \beta_d = .056 \text{ ns.} \]

**Figure 3** | TAS-20 Difficulty in Identifying Feelings partially mediates the Paternal Punishment → AIM Fear of Negative Appraisal link. Sobel's \( z = 2.049, p = .04 \), standardized indirect effect = .034, mediation = 16.9%. *Note.* \( ^* p < .05 \). \( ^** p < .005 \).

\[ \beta_a = .223^{**} \quad \beta_b = .151^{*} \quad \beta_c = .236^{**} \quad \beta_d = .204^{*} \]

**Figure 4** | TAS-20 Difficulty in Identifying Feelings fully mediates the Paternal Punishment → PCI-5 Negative Affect link in Hypnosis. Sobel's \( z = 2.613, p = .009 \), standardized indirect effect = .058, mediation = 37.6%. *Note.* \( ^* p < .05 \). \( ^** p < .005 \).

\[ \beta_a = .223^{**} \quad \beta_b = .258^{**} \quad \beta_c = .202^{**} \quad \beta_d = .127 \text{ ns.} \]
Figure 5 | TAS-20 Difficulty in Identifying Feelings fully mediates the Maternal Punishment → AIM Negative link. Sobel’s $z = 2.679, p = .008$, standardized indirect effect $= .058$, mediation $= 42.9\%$.  
*Note.* **$p < .005$.**

Figure 6 | TAS-20 Difficulty in Identifying Feelings partially mediates the Maternal Punishment → AIM Fear of Negative Appraisal link. Sobel’s $z = 2.071, p = .038$, standardized indirect effect $= .033$, mediation $= 16.9\%$.  
*Note.* *$p < .05$.* **$p < .005$.**

Figure 7 | TAS-20 Difficulty in Identifying Feelings partially mediates the Maternal Punishment → PCI-5 Negative Affect link. Sobel’s $z = 2.659, p = .008$, standardized indirect effect $= .057$, mediation $= 37.1\%$.  
*Note.* *$p < .05$.* **$p < .005$.**
5. DISCUSSION

The results partially supported the hypotheses, although the associations of the three constructs rarely exceeded medium effect size. In Hypothesis 1a, I expected that a set of different sub-dimensions of mentalization is related to certain parental behaviors, namely, it would show a positive correlation with recalled parental warmth and negative correlations with parental rejection and overcontrolling behavior, irrespective of the subject’s gender or that of the parent. I hypothesized (1b) that those children would show the best mentalizing abilities who recall warm-supportive (either authoritative or permissive) parents. Those Ss who remember their parents as cold, not supportive, or highly controlling, would demonstrate worse performance on the tests of mentalizing skills.

These expectations were, to a certain extent, supported by the findings, but the “problematic” aspect of attachment (Peter, Hagl, Bazijan, & Piesbergen, 2011) seemed to be in association with mentalizing. RMET scores entirely lacked to be correlated with or determined by parental rearing, or with ECS scores; although parental behavior predicted some variance in emotional contagion. For alexithymic emotional processing, more robust associations emerged. Separate analyses for the two parents supported that both parents’ overprotective and punishing behaviors were associated with TAS-20 Difficulty in Identifying Feelings. These parental styles, with the interaction of the Ss’ age, predicted around 10% of its variability. Variation in overall alexithymia scores was explained to 10–14% by Parental Punishment and/or Overprotection, age of the S, and whether the S was or was not a psychologist. Parental clusters also made differences: Children (especially sons) of cold-distant fathers as adults showed less Pragmatic Thinking, while children of average-controlling mothers had more difficulty in identifying their feelings as adults than those who recalled their parents as being of other styles. It seems that the children (especially sons) of cold-controlling and cold-rejective parents “learn” to suppress their emotions, which may also contribute to the fact that as adults they may perceive social situations as threatening and confusing (Mallinckrodt & Wei, 2005).

I hypothesized (2a) that warm-loving parental rearing style and cold-controlling behavior may lead to the child’s high hypnotizability in her or his adulthood; individuals, who recall their parents as having relatively high emotional warmth, high rejection, or overcontrolling. EMBU subscales and HGSHS:A scores did not show considerable correlation, with the following exceptions: Female Ss’ HGSHS:A observer-scores were negatively associated with Paternal warmth, and to about the same extent, positively correlated with Paternal rejection and punishment. The cluster analysis supported this pattern. This result is partially in correspondence with the findings of J. R. Hilgard (1970) and support the notion of Peter et al. (2011) that hypnotizability is related to the “problematic” aspect of attachment.

Based on theories and clinical observations, I hypothesized (2b) that those children who recall warmer and more caring parents would show more positive archaic involvement to the hypnotist, while the more cold and rejective parents they recall,
the less positive their emotional bond towards the hypnotist would be. In the entire sample, both paternal and maternal punishments were associated with a fear that the hypnotist would negatively evaluate the S in hypnosis. Both parents’ overprotective behavior had the same effect.

I expected (Hypothesis 2c) that such differences would be reflected in their archaic involvement and phenomenological experiences: The former group would have more positive experiences under hypnosis, while the latter would have more negative feelings. Both maternal and paternal punishments were associated ($r = .20$) with negative affects under hypnosis. Maternal punishment, profession, and age explained 9.5% of the variation in PCI-5 Negative Affect. Attention to internal processes, to a smaller extent (6%) was predicted by age and maternal overprotection. Children with different types of fathers did not have different kinds of experiences. Maternal types, on the contrary, had a small effect on the phenomenology of consciousness under hypnosis: Children of average-controlling mothers expressed the most negative feelings about being in hypnosis.

Hypotheses 3a, b, 4, and 5 described the probable association between mentalizing skills and the three dimensions of hypnotic responsiveness: Behavioral susceptibility, archaic involvement, and phenomenological experiences related to altered consciousness. In general, reading the mind in the eyes was not associated with hypnotic responses. Emotional contagion was related to behavioral hypnotizability scores to a somewhat smaller extent than in the investigation of Cardeña et al. (2009), possibly because in the present study, the association was controlled for context effect. Those who are more prone to catch and mimic others’ emotional expressions will be more involved in hypnosis emotionally, and will show more positive transference to the hypnotist. The propensity to take negative emotions seemed to be associated with phenomenology of ASC to a similar extent as it correlated with AIM subscales: Higher susceptibility to negative emotional contagion was associated with PCI-5 Dissociative control, negative affects, and attention to internal processes. Alexithymic emotional processing, especially the difficulty in identifying feelings, was related to hypnotic responses to a small-medium extent. In males, TAS-20 scores were negatively associated with HGS HS:A scores, meaning that higher alexithymia, to some extent, was correlated with lower hypnotizability. This may be reflected by the finding that, according to PCI-5 scores, higher alexithymia in males was also associated with less positive feelings about the hypnotic situation. Alexithymia in females was correlated positively with AIM−, indicating that higher alexithymia scores were accompanied by more negative emotions towards the hypnotist; and with PCI-5 Negative Affect, showing that alexithymia is also related to feeling more negatively about the hypnotic situation among females.

Hypothesis 6 set a possible mediation effect of mentalizing skills between parental style and hypnotic responding. Of these hypothesized mediations, parental punishment, difficulty in identifying emotions, and negative feelings towards the hypnotists and the hypnotic situation emerged. Both fathers’ and mothers’ punishing behaviors predicted Negative archaic involvement, Fear of negative appraisal and Negative affect in hypnotic state to a small to medium effect. When controlling the
regressions for the mediator effect of TAS-20 Difficulty in Identifying Feelings sub-scale, the direct causal links significantly weakened (meaning that the mediating effect was partial) or even ceased to be significant (suggesting full mediation). This means that the more frequent punishment in childhood was recalled, the more negatively the person felt in hypnosis towards the hypnotist and the more fear s/he expressed that the hypnotist would not be satisfied with her/his hypnotic performance. But this effect was partly or fully conveyed by that more frequently children reported about more difficulty in accessing their emotions. Based on the above discussed findings, it seems a rational explanation that a person who recalls frequent punishments will (1) be afraid of the hypnotist and (2) be afraid of social situations which s/he perceives as performance tests (and let us note that HGSHS:A, actually, is a performance test). But this effect may work because the person learnt in childhood that (3) negative emotions towards the cold and strict parents are not tolerable and these must be suppressed, which (4) makes such a social situation even more stressful and the hypnotist as even more “frightening”. Maybe such effects of alexithymia make it mediating between parental overprotection and personality disorder (De Panfilis et al., 2008), or between avoidance coping strategies and alcohol abuse (Coriale et al., 2012).

Hypothesis 7 was that the online administration of EMBU, RMET, ECS and TAS-20 can be valid and reliable alternatives of paper-and-pencil testing. The data were comparable to reference samples and other large-sample investigations carried out online and by paper-and-pencil tests, and support the position that under certain circumstances, online testing can replace the traditional method (Reips, 2002). Finally, I hypothesized (8) that experimenter variables would have an impact on the subjects’ hypnotic response. One of the hypnotists evoked higher positive archaic involvement and hypnotic susceptibility than the others. This was mainly attributable to an “emotional bias”: The given hypnotist was a senior university teacher who hypnotized many psychology students. This may have created a specific bond between her and the students (Bányai, Varga, & Gösi-Greguss, 2001). The effect of the subjects’ profession, gender, and age also played a role in the associations. In my opinion, it does not necessarily mean that psychology students should be excluded from hypnosis experiments, but the analyses always should be controlled for these subject (and experimenter) variables.

These findings have great bearings for hypnotherapy. They indirectly suggest that alexithymic clients—especially males—may consider the therapeutic situation as threatening. From the results of mediation analyses we can conclude that people who were often punished by their parents in childhood may find hypnosis negative (and may fear of that the hypnotist would be displeased with them) not because the hypnotist resembles to the punishing parent, but rather because they may be confused about the interpersonal situation. Therefore, it seems to be important to monitor our clients’ alexithymia and their memories of the parents before applying any hypnotic intervention. Affirmative and supportive behavior of the hypnotist—and emphasizing that we don’t expect the client to “perform well” under hypnosis—may help developing trust and comfort in the patient. This may prepare the beneficial effect of hypnotherapy on difficulties in mentalizing.
REFERENCES


PUBLICATIONS IN THE TOPIC OF THE DISSERTATION

Journal Articles


Conference Papers


**Posters**


Other Publications
ABSTRACT

Hypnotic interaction can occur only if both subject and hypnotist are able to process and understand each other’s mental states and act upon it. In spite of this, associations of mentalizing skills and hypnotic response have rarely been investigated so far. Many findings suggest that both mentalization and hypnotic susceptibility are partly determined by the affectional bonding towards the parents. Therefore, it seems reasonable to examine these constructs in the context of the subjects’ memories of parental behavior. The central question of the present doctoral thesis was whether the causal links between parental style and behavioral, emotional, and phenomenological dimensions of the hypnotic response are mediated by mentalizing skills. I hypothesized that warm and supportive parental style is associated with better ability for mentalization, and higher and more positive involvement in hypnosis, while cold, rejective, and punishing parental behavior was expected to predict poorer mentalizing, and negative involvement in hypnosis. To test these hypotheses, 565 healthy adults of various professions were hypnotized in standardized group hypnosis sessions. Their emotions towards the hypnotist and their experiences of the hypnotic state were investigated by paper-and-pencil questionnaires. A large part of the subjects filled in an online test battery, prior to the hypnosis session, assessing their memories about their parents, their capacity to read the mind from the eyes, proneness to emotional contagion, and level of alexithymia (the latter three aspects are considered to be sub-dimensions of general mentalizing ability). Alexithymic affective processing and memories about cold-punishing parents predicted negative feelings towards the hypnotist, and negative experiences in the hypnotic state to a small-medium extent. Difficulty in identifying feelings mediated between parental punishment and negative feelings in hypnosis. These findings suggest that mentalizing is associated with hypnotic response through the “problematic” aspect of affectional bond to the parents. Hypnotherapy can provide a safe, affirmative, and corrective transitional environment for the patients to practice mentalization.

Methodological innovations and key findings of the thesis:

- Developing the standards for the Hungarian version of the Harvard Group Scale of Hypnotic Susceptibility, Form A, and Emotional Contagion Scale
- A cluster analytic verification of parental styles
- Controlling for context effect, and addressing the issues of statistical power and effect sizes
- Alexithymic emotional processing, emotional contagion and profession explain the variance in negative experiences in hypnosis to 17%
- Difficulty in identifying feelings mediates between parental punishment and negative feelings towards the hypnotist, fear of negative evaluation of the subject by the hypnotist, and negative experiences in hypnotic state
- The data suggest that the hypnotic situation may provoke performance anxiety and vigilance to negative social cues in subjects (especially men) who recall cold and punishing parents