

Doctoral (PhD) Dissertation

**HYPNOTIC SUSCEPTIBILITY
AND MENTALIZATION SKILLS
IN THE CONTEXT OF PARENTAL BEHAVIOR**

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Hypnotic Susceptibility and Mentalization Skills in the Context of Parental Behavior

Doctoral (PhD) Dissertation
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I have noticed that when we work on a case together, you are always urging me on to physical action, Hastings. You wish me to measure foot-prints, to analyse cigarette-ash, to prostrate myself on my stomach for the examination of detail. You never realize that by lying back in an armchair with the eyes closed one can come nearer to the solution of any problem. One sees then with the eyes of the mind.

— Hercule Poirot

(Agatha Christie: *Lord Edgeware dies*)

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ADATLAP
A DOKTORI ÉRTEKEZÉS NYILVÁNOSSÁGRA HOZATALÁHOZ

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II. Nyilatkozatok

1. A doktori értekezés szerzőjeként hozzájárulok, hogy a doktori fokozat megszerzését követően a doktori értekezésem és a tézisek nyilvánosságra kerüljenek az ELTE Digitális Intézményi Tudástárban. Felhatalmazom a Pszichológiai Doktori Iskola hivatalának ügyintézőjét, Madar Veronikát, hogy az értekezést és a téziseket feltöltse az ELTE Digitális Intézményi Tudástárba, és ennek során kitöltse a feltöltéshez szükséges nyilatkozatokat.

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3. A doktori értekezés szerzőjeként hozzájárulok a doktori értekezés és a tézisek szövegének plágiumkereső adatbázisba helyezéséhez és plágiumellenőrző vizsgálatok lefuttatásához.

4. I, the undersigned András Költő, hereby declare that the present thesis—entitled *Hypnotic Susceptibility and Mentalization Skills in the Context of Parental Behavior*, DOI: *10.15476/ELTE.2015.117*, submitted for the title Doctor of Philosophy (PhD) in the Doctoral School of Psychology, Eötvös Loránd University—and the work to which it refers are the results of my own efforts. Any ideas, data, images, or text resulting from the work of others (whether published or unpublished) are fully identified as such within the work and attributed to their originator in the text, with a reference to the bibliography. This thesis has not been submitted in whole or in part for any other academic degree or professional qualification. I agree that the University has the right to check my work for possible plagiarism.

Kelt: Budapest, 2015. június 22.

A doktori értekezés szerzőjének aláírása

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ENGLISH 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

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MAGYAR NYELVŰ ABSZTRAKT

A hipnotikus interakció csak akkor jöhet létre, ha a hipnotizált személy és a hipnotizőr egyaránt képes feldolgozni és megérteni a másik résztvevő mentális állapotát, és annak megfelelően cselekedni. Ennek ellenére a mentalizációs készségek és a hipnotikus válasz kapcsolatát ezidáig csak ritkán vizsgálták. Számos szakirodalmi eredmény alátámasztja, hogy mind a mentalizációt, mind a hipnózis iránti fogékonyságot részben a szülőkhöz fűződő érzelmi viszony határozza meg. Doktori értekezésem központi kérdése az volt, hogy a szülői nevelési stílus és a hipnotikus válaszkészség viselkedéses, érzelmi és fenomenológiai dimenziói közötti kapcsolatot mediálja-e a mentalizációra való képesség. Hipotéziseim szerint a szeretetteljes, támogató szülői stílus összefügg a jobb mentalizációs készséggel és a hipnózisba való mélyebb és pozitívabban megélt bevonódással; míg a hideg, elutasító és büntető szülői viselkedés rosszabb mentalizációs képességhez és negatívabb hipnózisbeli élményekhez vezet. E hipotézisek tesztelésére 565, különböző foglalkozású egészséges felnőttet szabványos csoporthipnózis-helyzetben vizsgáltunk. A hipnotizőr iránti érzelmeiket és a hipnotikus tudatállapottal kapcsolatos tapasztalataikat papír-ceruza kérdőívvel mértük. A vizsgálati személyek nagy része a hipnózist megelőzően egy online tesztcsomagot töltött ki, amely a szülői nevelésre vonatkozó emlékekre kérdezett rá, valamint a szemekből való érzelmfelismerést, az érzelmi ragályra való hajlamot és az alexitímia-szintet mérte (ez utóbbi három konstruktumot az általános mentalizációs képesség részeként tartják számon). Az alexitímiás érzelmfeldolgozás és a hideg-büntető szülők felidézése alacsony-közepes hatásmérettel előrejelezte a hipnotizőr iránti negatív érzelmeiket és a hipnózissal kapcsolatos negatív élményeket. Az érzelmek felismerésének nehézsége mediált a szülők büntető viselkedése és a hipnózisbeli negatív tapasztalatok között. Ezek az eredmények arra utalnak, hogy a mentalizáció a szülőkkel való problematikus érzelmi kapcsolaton keresztül befolyásolja a hipnotikus válaszkészséget. A hipnoterápia biztonságos, megerősítő és korrekatív átmeneti környezetet biztosíthat a pácienseknek a mentalizálás gyakorlásához.

Az értekezés módszertani újításai és kulcsfontosságú eredményei:

- A Harvard Hipnabilitási Csoportskála magyar standardjének kialakítása és az Érzelmi Ragály Kérdőív magyarra adaptálása.
- A szülői nevelési stílusok igazolása klaszteranalízissel.
- Az alexitímiás érzelmfeldolgozás, az érzelmi ragályra való hajlam és a vizsgálati személy hivatása a hipnózisbeli negatív érzelmek 17%-át magyarázza.
- Az érzelmek azonosításának nehézsége mediál a szülői büntetés és a hipnotizőr iránti negatív érzelmek, a hipnotizőr rosszallásától való félelem és a hipnotikus állapottal kapcsolatos negatív tapasztalatok között.
- Az eredmények azt sugallják, hogy a hipnózishelyzet teljesítményszorongást és a társas ingerekre való fokozott figyelmet vált ki azokból a személyekből (különösen a férfiakból), akik hideg és büntető szülőket idéznek fel.

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LIST OF ABBREVIATIONS

ACC	anterior cingulate cortex
AIM	Archaic Involvement Measure
ASC	altered state of consciousness
BVAQ	Bermond-Vorst Alexithymia Questionnaire
CFA	confirmatory factor analysis
COMT	Catechol- <i>O</i> -Methyltransferase
ECS	Emotional Contagion Scale
EMBU	“My Memories of Upbringing” Questionnaire
H	hypnotist
HH	high hypnotizable
HGSHS:A	Harvard Group Scale of Hypnotic Susceptibility, Form A
LH	low hypnotizable
MH	medium hypnotizable
OXT	oxytocin
PFC	prefrontal cortex
PCI	Phenomenology of Consciousness Inventory
RMET	Reading the Mind in the Eyes Test
S	subject
SEM	structural equation modeling
SHSS:A	Stanford Hypnotic Susceptibility Scale, Form A
SHSS:B	Stanford Hypnotic Susceptibility Scale, Form B
SHSS:C	Stanford Hypnotic Susceptibility Scale, Form C
TAS-20	Toronto Alexithymia Scale, 20-Item Version
ToM	theory of mind
WSGC	Waterloo-Stanford Group Scale of Hypnotic Susceptibility, Form C

Statistical abbreviations were used according to the American Psychological Association’s conventions, including **AIC** = Akaike information criterion, **ANOVA** = analysis of variance, **B** = unstandardized regression coefficient, **CI(min)** = lower bound of confidence interval, **CI(max)** = upper bound of confidence interval, **CFI** = Comparative Fit Index, **CMIN** = Chi-square value for confirmatory factor analysis, **d** = Cohen’s effect size d, **df** = degrees of freedom, **f²** = *f* squared effect size for regression, **F** = F ratio, **M** = mean, **n** = number in subsamples, **N** = number of total sample, **ns.** = not significant, **p** = probability, **PCLOSE** = probability for RMSEA, **r** = Pearson’s correlation, **r_{ES}** = effect size *r*, **RMSEA** = root mean square of errors, **R²** = explained variance, **SD** = standard deviation, **t** = Student’s *t*-test value, **TLI** = Tucker-Levis Index, **U** = Mann-Whitney U test value, **z** = *z* test value, **β** = standardized regression coefficient beta, **η²_p** = partial eta squared effect size, **χ²** = chi-square test value, **ω** = effect size omega (for analysis of variance).

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A SUBJECTIVE INTRODUCTION

HAVE YOU EVER OBSERVED a child, being deeply involved in the bedtime tale told by a parent? Sometimes my clients report after hypnosis that my voice was just like Daddy's when he told them their favorite tale (although, at least on the conscious level, I don't intend to act like their father). One client said that she felt like she was just lolling in the sea. A man struggling with assertivity problems was fascinated by the feeling that his arm went stiff, like a steel rod in hypnosis. Another young man had difficulties in relating to and expressing his feelings, and suffered from feeling unable to love. He ate apricots in a hypnotic garden, thus allowing himself to gratify his need for "a really sweet" experience. A young woman with trichotillomania—an obsessive urge to pluck out her hair—was carefully grooming the tiny blades of grass in her garden under relaxation. This empowered her to take care of her hair in the same way. Even subjects participating in my investigations, undergoing standardized laboratory hypnosis sessions, report a great variety of individual experiences.

When hypnotized, many people show surprising changes in their behavior and experiences, as compared to their normal waking state. This is true not just for the hypnotized person, but, in many cases, for the hypnotic operator as well. Hypnotists were neglected subjects of research for a long time, because hypnotic phenomena had not been considered to be interactive (Bányai, 1998). An anonymous hypnotist, taking part in an experiment in which she or he administered a standardized hypnotic susceptibility scale to the subject, reported subsequently:

It amazed me again, as oftentimes: I even checked my watch, we were in the 13th minute, I looked at her, and was surprised, that here is this "complete stranger", I have never seen her in my life, and here we are after some 10 minutes, that she is sitting here with a drooping head, open mouth, relaxed, and visibly, she really accepts the suggestions. In cases of such stranger experimental subjects the thought always—or at least often—strikes me: How the hell is it? Why/how does an adult give himself up/over? Does hypnosis really exist? Do altered states of consciousness really exist? These ideas struck me again quite strongly today with this girl... (Varga, 2013, p. 121).

Since my graduation from high school in 2001, hypnosis has been a subject of my intensive interest. While observing standard laboratory hypnosis sessions (from 2003) and conducting hypnosis in research and clinical field (from 2011), I also got occupied by the questions the above cited hypnotist raised. For me, the most important and still unsolved problems of hypnosis are: Why do people differ in their reactions to the same hypnotic procedure? How can it be that in such a short period of time, two people (or the participants of a group) attune to and get synchronized with each other? How do these two (or in a group, more) people perceive, understand, identify, and maintain such an intricate and intimate situation?—Many researchers and clinicians added important pieces to this puzzle, but the entire explanation is still missing. While getting acquainted with the scientific approaches to hypnosis, I got the impression that researchers did a great job in understanding behavioral, cognitive, and neural aspects of hypnosis, but less emphasis was put on the emotional or affective side of the phenomenon. Hypnosis, in my opinion, cannot occur without the subject and the hypnotist to process each other's mental state, including their actual affective condition.

The ability to interpret interpersonal behavior in terms of mental states seems to be essential in the organization of the self and in the regulation of affects, and it is established in early attachment relationships. This ability is called mentalization¹ (Fonagy, Gergely, Jurist, & Target, 2002; Fonagy & Target, 2003) or, with an operative synonym, *reflective functioning*. It makes children able to perceive and understand—"read"—people's minds (Baron-Cohen, Lombardo, & Tager-Flusberg, 2013). It is, however, not just a cognitive process, but it is also closely related to affect

¹ The term "mentalization" was first used in 1928 by the Swiss neurologist and child psychologist Édouard Claparède, then four decades later it was adopted by a French psychoanalyst, Pierre Marty. He applied the term to psychosomatic medicine: Mentalization refers to the quantity and quality of the individual's mental representations, the quality of their articulations, bonds, and networks (Fine, 2005) which construct a protective buffer at a preconscious level that prevents progressive disorganization (Marty, 1968), leading to psychosomatic illness.

regulation, as it is a means of experiential understanding of our affects. Mentalizing can be described as a form of imaginative mental activity about others or oneself, including perceiving and interpreting human behavior in terms of intentional mental states (e.g., needs, desires, feelings, beliefs, goals, purposes, and reasons) ([Bateman & Fonagy, 2012](#)). Let us notice that this definition has a close resemblance to hypnosis as defined as a form of imaginative involvement ([J. R. Hilgard, 1970](#)).

Individual differences in responses to hypnosis are labeled with the terms “hypnotizability”, “hypnotic susceptibility”, or “hypnotic suggestibility”. These basically denote one’s capacity to experience hypnosis and demonstrate behaviors associated with it. Different—competing or opposing—theoretical approaches attempt to explain hypnosis and the nature of hypnotic responding. The theoretical schools of hypnosis, according to their conceptual framework, employ different terminologies for hypnotic capacity. In the clinical word, assessment of hypnotic capacity is not regarded to be as important as in research: Maybe that is the reason for many clinicians, according to an international research, prefer to use the term “trance-ability” ([Munson, Trenkle, & Gallawa, 2015](#)). This causes confusion, disagreement (and, in my opinion, a lack of mutual understanding between scholars and clinicians who use hypnosis). In the present thesis, I use *hypnotic response* as the most general term, including all kinds of reactions to standard hypnotic induction and suggestions. Of the above mentioned terms, the word *hypnotizability* seems to be the most neutral theoretically ([Christensen, 2005](#)). In the following, I use it as a descriptor of variation between subjects in the behavioral, emotional and phenomenological responses to standard hypnosis. *Hypnotic susceptibility* will be used in the narrowest sense, covering the individual variability in the subjects’ observed and self-rated scores obtained on standard hypnotic susceptibility scales.

How can we define hypnosis? According to the most widely accepted account, “Hypnosis is a social interaction in which one person, designated the subject, responds to suggestions offered by another person, designated the hypnotist, for imaginative experiences involving alterations in conscious perception and memory, and the voluntary control of action” ([Kihlstrom, 2008, p. 20](#)). Another important aspect of hypnosis is that, according to many theorists, it belongs to the natural category of altered states of consciousness (ASCs), characterized by specific induction techniques, associated with a set of overt behaviors, based on certain neurophysiological mechanisms, and leading to a given pattern of subjective experiences ([Kihlstrom, 1984](#)). It is important to note, however, that the nature of hypnosis is a subject of intense debate, and opposing hypnosis schools theorize about it in different fashions.

Hypnotic susceptibility, in an operational way, is frequently referred to as a unidimensional capacity represented by the extent of behavioral responses to a standardized set of hypnotic suggestions. This approach, however, does not take it into consideration that people also differ in their emotional responses to hypnosis (in psychodynamic terms, it is related to the so-called “archaic involvement”) and in their experiences attributable to the extent of alteration in their consciousness. In the three-dimensional approach of hypnotic depth ([Shor, 1962](#)), the behavioral, emotional, and phenomenological aspects determine the extent of hypnotic response in an interactive way. The social-psychobiological model of hypnosis ([Bányai, 1991, 2008b](#)) accepts Shor’s multi-dimensional approach and gives many pieces of evidence for hypnosis being largely influenced by affects. The social-psychobiological approach can be extended to a direction in which hypnosis is interpreted as the product of a mutual *affective and cognitive attunement* of the hypnotized person(s) and the hypnotist.

“It takes two to tango:” Hypnosis cannot occur without the efforts of both the hypnotized person and the hypnotist, therefore it can be seen as a reciprocal interpersonal process ([Diamond, 1984](#)). The social-psychobiological approach considers hypnosis as an interaction between the participants ([Bányai, 1998](#)). The empirical testing of the social-psychobiological theory of hypnosis gave ample evidence that the participants may experience high levels of affective, cognitive, behavioral, and neurophysiological attunement ([Bányai, 2008b](#)). In spite of that, to the best of my knowledge, not other concept but the social-psychobiological model include “attunement” (although some reflect to the reciprocal and interactive nature of hypnosis), and none of the current hypnosis theories embrace that the interaction can occur only if all participants have certain skills or abilities in attunement to the other. If such an attunement exists—and a large corpus of research rooted in the social-psychobiological theory has proven its existence—, hypnotic responses must be

partly determined by specific skills or abilities of the subject in understanding the hypnotist's and their own actual mental states, cognitive and affective conditions. The hypnotist should also have such capabilities.

Participants of the hypnotic interaction also need to maintain a certain reflective, monitoring function to identify the changes in their own and the other participant's mental state, which often leads to an experience of altered consciousness in the hypnotized subject, and in some cases in the hypnotist as well (Varga, 2013). A similar idea was raised by Bonshtein (2012). In his opinion, hypnosis mobilizes the subjects' theory of mind (ToM) through the activation of their mirror neuron systems. The concepts "reflective", "attunement", "identify", and "read" suggest that hypnosis, to a certain extent, is the function of *mentalization*, a concept which is closely related to ToM, and can be described as a special conglomerate of affective and cognitive processing abilities.

The ability for mentalization is rooted in the early relationships and in the development of the self. Apparently, those children will be able to read and understand mental states and utilize this information to regulate their affects that had been able to establish a secure attachment style with their primary caretakers. Both the mother's and the father's ability for reflective functioning contribute to the child's adult mentalization skills (Fonagy, 2003). If we accept that hypnotic susceptibility is at least partly based on mentalization ability, it is a logical consequence that responsiveness to hypnosis is associated with early childhood experiences, attachment style, and the parents' behavior towards the child (termed as *parental rearing style*). Due to methodological difficulties, to the best of my knowledge, there has been no systematic longitudinal investigation of how infants' attachment style influence their adult hypnotic responsiveness, but we have indirect—qualitative and quantitative—empirical evidence that the emotional quality of childhood memories about the parents are associated with hypnotizability (J. R. Hilgard, 1970; Költő, 2008; Heller, 2011). Findings on adult attachment also support this assumed relationship (Dóka, 2009; Peter, Hagl, Bazijan, & Piesbergen, 2011).

The above outlined train of thought drove me to formulate the following concept:

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.

In this doctoral dissertation, I aim to provide evidence for the above described hypothesis, a "mentalization" approach for hypnosis. Structures of the theoretical and the empirical part of my dissertation follow this triangular argumentation, demonstrating the associations between parental rearing and mentalization, between mentalizing skills and hypnotic responses, and between recalled parental behavior and hypnotic capacity. In my opinion, an appropriate theory of hypnosis should involve the developmental aspects of hypnotic susceptibility, the affective nature of the hypnotic interaction, and it should explain how the hypnotist and the subject understand each other's mental conditions—including emotions, motivation, expectation, intention, attitudes, cognition, and other phenomena—in order to co-create an altered state of consciousness. There are many pieces of evidence showing that mentalizing abilities (and other dimensions of affective processing) are largely determined by attachment and by parental behavior, especially by the parents' rearing style. Some preliminary results (Peter et al., 2011; Költő, 2008) show that hypnotizability is also associated with attachment to parents and peers. I hypothesize that not just primary attachment but the whole course of socialization has a large influence on hypnotic responses: Adults may "recall" affective responses in the hypnotic situation they learned from their parents in their childhood. Certainly, our affects are determined and formed by many factors, including actual mood, environment, the agreeableness of our interactional partner, etc. These factors may moderate, overwrite or even eliminate these processes. Therefore, I also wanted to find out whether or not mentalization skills mediate between recalled parental rearing style and hypnotic responses. A secondary aim of the thesis is

methodological: It wishes to examine the psychometric properties, reliability, and structural and convergent validity of the applied measures, and to test whether some of them can be applied via an online surveying system.

The present thesis consists of five larger blocks. The first three chapters form a literature review and a theoretical introduction to how parental behavior and mentalization (Chapter 1), and parenting style and hypnotic response (Chapter 2) are associated. In Chapter 3, I attempt to link these in the above mentioned conceptual model, which will be tested in the empirical part. In the next two chapters, aims and scope of the present thesis are outlined, hypotheses are set (Chapter 4), and the sample and the methods are presented (Chapter 5), although some methodological information—to help the reader in interpreting the findings—will be presented in the next block, which contains the results of testing the hypothesized model. In Chapter 6, descriptive statistics and proofs of validity and reliability of the applied measures can be found. In Chapter 7, data on convergent and discriminant validity are presented to check if the applied measures refer to the same (or similar) psychological constructs. Chapter 8 consists of findings on how mentalization skills and dimensions of hypnotic response are related. In Chapter 9, it will be tested whether elements or patterns of parental behavior can predict mentalizing skills and hypnotic susceptibility. Finally, the three constructs are examined together to see if any causal relationships can be found between them (Chapter 9). In the fourth block (Chapter 10), the results are discussed, with special attention to the possible relevance of the findings in hypnotic psychotherapy, on the limitations of the study, and on possible ways of further research in this topic. The fifth block consists of the Hungarian summary, the list of references and the addendums including the informed consent form, some of the applied measures, and supplementary information on statistical analysis. At the end of all chapters, a short summary of the given chapter will be provided.

You will see that I report the methodological details of the applied measures and many “basic” statistical analyses and extensive confirmatory factor analyses to test structural validity. I am aware of the fact that these should go into validation articles. My reason for presenting these pieces of information is twofold. First, I have written the present thesis in the hope that it will be useful for researchers of both hypnosis and mentalization. The scientific investigation of how these constructs are related to each other—apart from some theoretic papers (e.g., [Bonshtein, 2012](#); [Költő & Bányai, 2015](#)) and preliminary studies ([Gay, Hanin, & Luminet, 2008](#); [Cardeña, Terhune, Löff, & Buratti, 2009](#))—is largely missing. Therefore, I hoped I can help scholars of both areas with giving a detailed introduction about the applied measures. The other reason was that, in spite of the extensive research with some of the scales, apart from the Harvard Group Scale of Hypnotic Susceptibility (HGSHS:A) ([Költő, Gósi-Greguss, Varga, & Bányai, 2015](#)) and the Toronto Alexithymia Scale (TAS-20) ([Cserjési, Luminet, & Lénárd, 2007](#)), no validation studies exist on the Hungarian version of the applied measures. The present thesis also intends to partly fill these gaps. Because the discussed relationships are rather undiscovered, the current research project has a tentative nature. You will see that some of my hypotheses are speculative. I undertake the shortcomings of this approach, accepting that some associations might prove nonsignificant. Following some recent methodological suggestions ([Ioannidis, 2005](#)), I am critical about the overreliance on “ $p < .05$ ”. I advocate to take effect size and statistical power in consideration, following the statistician’s advice to psychologists ([Cohen, 1990](#)).

Technical notes. First, under some tables and figures, where data are not obvious (like reporting means and standard deviations), you will see a short explanation printed in bold letters. I hope this will help in understanding the respective data. Second, I am a native of a language—Hungarian—which does not use grammatical gender. If a neutral person is mentioned I will use “he or she”, “s/he”, or just “he” or “she”. I personally agree with the social constructivist view ([Gergen, 1985](#)) that characteristics we attribute to women or men are rather socially constructed products than biologically determined features. That’s why I use the term *gender* instead of the biological *sex*. Certainly that does not mean that I underrate or marginalize such differences between genders which are rooted in evolutionary processes ([Joseph, 2000](#)). Although the issue of gender is an important topic of my dissertation, I strived to produce an unbiased text. I advocate that female and male subjects, clients, clinicians, and researchers contribute to hypnosis in equally important ways, regardless of their gender.

1. PARENTAL BEHAVIOR AND MENTALIZATION

THE WAY OUR PARENTS TREAT US determines of our psychological characteristics in our adulthood to a large extent. The behavior of the parents—through responses to the child’s needs, specific actions to limit or to encourage specific activities of the child, and in different contexts observed by the child—has an especially large bearing on the affective processing of the child. Indeed, our emotional responsiveness, according to the psychoanalytically grounded mentalization theory, is formed by how our primary caretaker reacts to our needs in the preverbal phase. The key of mentalization is the attachment between the infant and the caretakers. Attachment to parents, as assessed in adulthood, is a hard nut to crack, as we have to rely on the retrospective recall of the subjects. This is the reason why attachment in these cases is usually operationalized as “recalled parental behavior”. This is based on the notion that the parents’ behavior towards the child is strongly associated with the attachment between the infant and the parent. In the present chapter, first the developmental aspects and neural correlates of mentalization will be presented. Research findings underpin the theoretical stance that mentalization is associated not just with the attachment to the parents, but also with the recalled parental behavior. In the following sections, theoretical foundations and empirical evidence of parental rearing style and its association with mentalization are summarized.

1.1. Developmental Roots of Mentalizing Ability

Understanding others’ and one’s own mental states is a complex and intricate process. Some of them are shortly emerging and changing instances, like emotional states induced by social situations, whereas others are long-term dispositions, like the assumption that the other person is trustworthy. Mentalization shall involve brief, automatic, and unconscious processes as well as conscious, cognition-driven, rational elaboration ([Frith & Frith, 2006](#)). These sub-skills constitute the general ability coined “mentalization.”

A concept closely related to mentalization is the Theory of Mind (ToM), the ability to attribute mental states—beliefs, intents, desires, pretending, knowledge, etc.—to oneself and other people. It also involves the recognition that other people have mental contents different from one’s own ([Premack & Woodruff, 1978](#)). Some use mentalization and ToM as synonyms ([Gallagher & Frith, 2003](#)). These concepts are the members of a broader category, social cognition ([Fiske & Taylor, 1991](#); [Todorov, Fiske, & Prentice, 2010](#)).

The concept of mentalization is rooted in Bowlby’s theory of attachment ([Bowlby, 1969](#)) and its empirical investigation by Ainsworth ([Ainsworth & Bell, 1970](#); [Bretherton, 1992](#)). That we experience ourselves as entities with psychological self is not a genetic aptitude, but the result of a process from birth to childhood. This process is determined by the interactions of the baby’s mind with more mature, benevolent, reflective and attuned psyches. According to Fonagy and Target, those infants who are raised in warm, loving and reflective social environments will be more likely to develop a secure attachment style and a coherent and well-functioning way of mentalization. On the other hand, children treated by preoccupied, abusive or abandoning caretakers will be less likely to experience and internalize reflective functioning. Therefore, babies characterized by ambivalent, avoidant, or disorganized attachment styles, are prone to develop a fragmented and insufficient ability for mentalization (although they might be able to reflect on their own or others’ mental states).

An evolutionary function of the early object relationships is that they provide an environment for the infant, in which he or she is able to understand others’ mental states, and the self can generate an entire and secure way of mentalization. The process in which the child acquires this ability cannot be distinguished from the caretakers’ constant and repetitive reflection on his or her emotions. The development of mentalization, according to Fonagy and Target, can be explained on the ground of two developmental models. One of these is the social biofeedback theory of parental

affect-mirroring ([Gergely & Watson, 1996](#)). In the social-psychobiological theory, interactional processes analogous with social biofeedback is an important element of the hypnosis induction ([Bányai, 2008b](#)). One of the reasons for hypnotherapy to be an effective treatment in diseases which are considered to have a preverbal root—like many psychosomatic illnesses—may be that hypnosis, just like the relationship between the primary caretaker and the infant, is similar to social biofeedback ([Bányai, 2008a](#)). The effect of hypnotherapy on mentalizing skills will be discussed in Section 10.6, on the clinical relevance of the findings.

The baby learns that the parental reactions to her or his emotional expressions are contingent, which leads to experiencing her or his self as an agent. This provides a ground for the self to act as an affect regulator. The parental reflections, in ideal cases, are not referring to the parent's own emotions, but they are reflecting the child's own affects. That quality is called "markedness". A secure caretaker exerts soothing in a way that the reflection of the infant's bad feelings is mixed with marking that the caretaker is not overwhelmed by these feelings.

The other source for mentalization is the transition from *psychic equivalence* to separation of the inner and the outer world. The infant initially equates the internal and the external: No difference is made between the things existing in the mind and those existing out there. This unity can be the source of intensive distress, as the child may attribute real consequences to her or his fantasies ([Fonagy et al., 2002](#)). An example for this equality is the unshakeable belief of the child that there is a tiger under the bed ([Fonagy & Bateman, 2006a](#)). Mentalization, under normal circumstances, is established by the child's regular experience that her mental states are mirrored. Mirroring is provided by the secure play with the caretakers or older children. Playfulness provides a possibility for *pretend mode*: the caretaker or an older child connects the child's ideas and feelings to reality ("It is only pretended"), but at the same time, it offers the existence of an alternative perspective which is independent of the child's mind ([Fonagy & Target, 1997](#)). Three-year-old children who are more involved in cooperative interaction and its specific form, joint pretend play ([Youngblade & Dunn, 1995](#)) perform better in mind-reading and emotion understanding tasks than their less-involved mates. It seems feasible that psychotherapy also provides a secure environment for such "pretend play" ([Fonagy & Target, 2000](#)), since the therapist accepts the client's representations, but also offers an alternative angle to investigate reality

In evaluating their theory, [Fonagy and Target \(2003\)](#) set the limitation that the concept of mentalization, in its current state of art, is overemphasizing its cognitive nature, and is less concerned with affective experiences. Reflective functioning—albeit it is obviously a very important process—is insufficient to explain well-being and interpersonal relationships on its own. There are many who can make their way in life with a relatively weak ability for mentalizing, while others, who perform excellently in this area, may struggle. Although Fonagy and Target stated that (a) mentalization is needed only in environments that cause great interpersonal stress and (b) those who seem to be good mentalizers but don't function well, in fact have damaged or distorted reflective function, they acknowledge that the theory needs refinement in these areas.

It is also important to note that besides having robust representations of others' mentalistic processes we also need to mentalize ourselves. "Lexithymia", the ability to identify and express one's own emotions ([Moormann et al., 2008](#)), self-compassion ([Neff, 2003](#)), the therapist's attempts to understand her/his countertransference feelings towards the client ([Kernberg, 1975](#)), and in general, our striving to gain self-knowledge all include elements of self-mentalization.

1.2. Neural Correlates of Mentalization

Mentalization has a complex and intricate neural background. [Frith and Frith \(2006\)](#) argue that the most important brain basis for mentalization is the mirror neuron system. The simulation theory posits that we can understand others only on the basis of our own mental states ([Gallese & Goldman, 1998](#)). If we observe a person experiencing a certain emotion, our brain will activate the same areas needed for experiencing that emotion, like a contagion. We are automatically imitating not just others' emotions but their actions, too: this is the so-called "chameleon effect" ([Chartrand & Bargh, 1999](#)). These processes are performed by the mirror neuron system. Mirror neurons—special visual motor neurons—were found first in the F5 region of the ventral premotor cortex,

coding the motion of the hands during grasping and in interactions between the hand and the mouth, in rhesus monkeys observing such actions ([Gallese, Fadiga, Fogassi, & Rizzolatti, 1996](#)). The investigated neurons became active both when the monkeys performed a given action and when they observed a similar action performed by the experimenter. Since then, extensive research projects were conducted to investigate the mirror neuron system, although the large majority of evidence consists of investigation of the macaque brain. A notable exception is the neuroimaging study by [Gazzola and Keysers \(2009\)](#) who analyzed fMRI recordings of human Ss. They found that besides the ventral premotor cortex and the rostral inferior parietal lobule many other brain areas also contain mirror neurons, including the dorsal premotor cortex, the supplementary and cingulate motor areas, the superior parietal lobule, the somatosensory cortices, and the cerebellum. This, in general, suggests that the mirror neuron system translate the perceived actions into motoric and somatosensory representations of how and what the observed person did, and these representations can be further elaborated through other mechanisms about the “why” of the actions ([Thioux, Gazzola, & Keysers, 2008](#)). Thus, the mirror neuron system provides the “material” for mentalization.

In their review about the neuronal background of mentalization, [Frith and Frith \(2006\)](#) list the neural correlates of perspective taking, knowledge of the world, anticipating the future, and understanding whether people are similar to or dissimilar from us. These represent a broad array of skills and abilities which are elements of mentalizing. Their shared neurophysiological background, besides the mirror neurons, includes the posterior part of the superior temporal sulcus, the temporoparietal junction, the temporal poles, and the medial prefrontal cortex (mPFC). Although the precise sifting of their roles in mentalization has only started in the recent years, some of their functions can already be identified. The mPFC—and the adjacent paracingulate cortex including the anterior cingulate cortex (ACC)—is involved in a wide array of cognitive and affective mechanisms. Patients with damaged frontal cortex show reduced performance in the theory of mind tasks. The medial PFC seems to be connected to the anticipation what a person ought to think and feel, and from this information predictions can be made about her or his future behavior. The object of these anticipations can be the self as well as others ([Frith & Frith, 2006](#)). Furthermore, separate parts of the PFC seem to be involved when mentalizing people who are similar to or dissimilar from us ([Amodio & Frith, 2006](#)). The most ventral region is related to monitoring emotions in ourselves and in our interactional partners. The dorsal part, including the “cognitive” section of the ACC, monitors actions, both in the self and the other. In general, mentalization seems to be a process with right hemispheric dominance ([Ohnishi et al., 2004](#)), but it may involve the integration of stimuli processed in the right or the left hemisphere as well.

Ability for mentalization, operationally, seems to be a too wide and complex concept to be a subject of psychogenetic investigation. Some studies, however, investigated the genetic background of the ToM. [Xia, Wu, and Su \(2012\)](#) found that in healthy adults, polymorphisms of the Catechol-*O*-Methyltransferase (COMT) gene were significantly associated with performance in cognitive and affective ToM-related tasks. COMT is an enzyme which metabolizes dopamine, therefore its level in the central nervous system—determined largely by genetic factors—play an essential role in the organization of attention and many cognitive and affective processes. COMT, especially its single nucleotide polymorphism coding Val^{108/158}Met variations (meaning that on the 108th and 158th codones of the COMT gene, valine or methionine amino acid molecules may take place) also seem to have an influence on empathy, social cognition, and alexithymia,² which may all be interpreted as mentalizing sub-skills. In another investigation carried out with preschoolers, neither COMT nor the dopamine transporter gene was associated with the performance on ToM tasks. Nevertheless, polymorphisms of the dopamine D4 receptor gene had a significant influence on the children’s representational Theory of Mind ([Lackner, Sabbagh, Hallinan, Liu, & Holden, 2012](#)). In a third study, mind-reading was significantly associated with variations of the oxytocin receptor gene ([Lucht et al., 2013](#)). Oxytocin (OXT) is a neuropeptide which has an important role in social affiliation and social cognition. For instance, its level is related to the ability for reading the mind in

² The Val^{158/108}Met polymorphism is also related to altruistic behavior ([Reuter, Frenzel, Walter, Markett, & Montag, 2011](#)) and many other dimensions of affective and cognitive processing. The role of this genetic variability will be further discussed in Section 2.2, on the neural correlates of hypnotic responses.

the eyes, but it is also connected to other sub-skills or dimensions of mentalization ([MacDonald & MacDonald, 2010](#)). These results shed light on the psychogenetic and psychoendocrine regulation of mentalization.

1.3. Assessment of Mentalization and Parental Behavior

Since mentalizing is conceptualized upon its pathological aspects, its assessment is also based mostly on its impairment ([Luyten, Fonagy, Lowyck, & Vermote, 2012](#)). As attachment strategies, arousal, stress, and mentalization influence each other, assessment ideally takes place in the subjects' different arousal states. The relationship with the assessor means a new attachment situation for the subject; therefore the subject's responses (with respect to the monitoring and understanding of the assessor's mental states) also have a diagnostic value. Mentalization is an interpersonal process; therefore at least partly it should be measured by behavioral signs shown in interpersonal situations. That was the basis for developing the Reflective Functioning Scale ([Fonagy, Steele, Steele, Moran, & Higgitt, 1991](#); [Fonagy, Target, Steele, & Steele, 1998](#)). This procedure is based on the secondary analysis of the subject's responses at the Adult Attachment Interview, a semi-structured qualitative method which retrospectively measures and classifies the respondents' attachment style in her or his early attachment relationships ([George, Kaplan, & Main, 1985](#)). Other measures of relationship specific mentalization include the Child Attachment Interview ([Shmueli-Goetz, Target, Fonagy, & Datta, 2008](#)) and the Parent Development Interview ([Slade, Aber, Berger, Bresgi, & Kaplan, 2004](#)). Although these methods provide a detailed picture of the respondent's mentalization skills in specific relationships, the results are hard to generalize as they don't consider the fact that mentalization may fluctuate. Furthermore, they are rather time consuming and expensive.

A wide variety of measures of social cognition also reflect on different facets of mentalization. As mentalization itself is a rather intricate and complex internal mechanism which may vary across situations and interactional partners, it is hard to be measured with a single and time-effective measure. Investigating other aspects of social cognition also provides a possibility to list psychological concepts related to mentalization. Measuring these concepts also give researchers a chance to probe into the convergent validity of mentalizing ability. A good example of this is alexithymia, which can be measured by interviews, observations, and questionnaires as well. Such an interview method is the Toronto Structured Interview for Alexithymia ([Bagby, Taylor, Parker, & Dickens, 2005](#)). As alexithymia involves the inability to access and identify one's own emotional states, it seems reasonable that the extent of alexithymic processing reflects on impairment in mentalizing one's own affects.

Beside the above mentioned interview or narrative coding systems many experimental-observational tasks, questionnaires, and projective measures can be applied for measuring mentalization skills. These include, for instance, the Reading the Mind in the Eyes Test (RMET) ([Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001](#)), a recognition task in which the subject has to connect an eye strip of a human face to one of four words denoting emotional states. Another experimental approach to mentalizing is the electromyographic assessment of facial mimicry ([Sonnby-Borgström & Jönsson, 2004](#)). In this paradigm, the subjects are exposed to photos of angry or happy faces, and the degree of correspondence between the subjects' facial electromyography reactions and their self-reported feelings is measured. The EMG of facial mimicry is based on the concept of emotional contagion ([Hatfield, Cacioppo, & Rapson, 1994](#)) which means that we empathize with others through the automatic mimicking of their facial expressions, which in turn facilitates experiencing the other person's feelings. RMET and EMG of facial mimicry utilize the fact that during the mentalization of others' emotions we integrate cognitive and affective information, and that the processing mechanism delivers the representation of the emotional state of the interactional partner.

Among questionnaires which may reflect on mentalization, Luyten and his colleagues list many which measure different aspects of empathy, like the Interpersonal Reactivity Index ([Davis, 1983](#)) or the Empathy Quotient ([Lawrence, Shaw, Baker, Baron-Cohen, & David, 2004](#)). Other closely related concepts are emotional intelligence, measured by the Mayer-Salovey-Caruso Emotional Intelligence Test ([Mayer, Salovey, Caruso, & Sitarenios, 2003](#)); psychological mindedness,

assessed by the Psychological Mindedness Scale ([Shill & Lumley, 2002](#)); mindfulness, as measured by the Kentucky Inventory of Mindfulness Skills ([Baer, Smith, & Allen, 2004](#)); and the above mentioned alexithymia. Although there are criticisms for measuring the latter with verbal questionnaires—as alexithymic persons may also be hindered in their verbal expressions—there are two widely used measures for it: the TAS-20 ([Bagby, Parker, & Taylor, 1994](#)) and the Bermond-Vorst Alexithymia Questionnaire ([Vorst & Bermond, 2001](#)). There is also a short questionnaire assessing the propensity of emotional contagion, the Emotional Contagion Scale (ECS) ([Doherty, 1997](#)); and for assessing empathy, the Interpersonal Reactivity Index ([Davis, 1983](#)) is also a widely used method.

Although [Luyten et al. \(2012\)](#) did not list them, it worth to be mentioned that the context of early attachment and parental behavior can also be evaluated retrospectively, by paper-and-pencil questionnaires. Because of their strong correlation, assessment of parental rearing style is to some extent overlapping with the ways mentalization skills are investigated. Certainly, direct observation of the parents' behavior towards the child conveys the most information about her or his rearing style. Nevertheless, information on this aspect can also be obtained from the child who was “subject” of the parent's rearing behavior. The most frequent qualitative method to unfold the child's memories of her or his parent's rearing style is the aforementioned Adult Attachment Interview. Recalled memories can also be assessed by paper-and-pencil questionnaires. These include the Parental Bonding Instrument (PBI) ([Parker, Tupling, & Brown, 1979](#)) and My Memories of Upbringing Questionnaire (EMBU) ([Arrindell et al., 1999](#)).

Luyten and his colleagues emphasize that proper assessment of mentalization should include at least two or three sessions of structured interviews, explicitly probing for mentalization in past and current relationships. This enables the investigator to check whether the subject's inability or insufficiency in specific areas of mentalization is temporary or enduring, and if the initial impairment demonstrates improvement or not. In spite of this, I argue that with a carefully assembled battery of measures—including at least one nonverbal experimental or observational task—valid investigation can be made on the subject's affective processing skills, and from this we can make predictions about her or his mentalization ability.

1.4. Typology of Parental Behavior

As the child gets older, the “primary” form of parental attachment—realized, in an optimal case, in satisfying the child's needs of physical and emotional well-being—is gradually replaced by the child's interactions with her or his broader environment. Around the age of 2–3, children gradually recognize that the primary caretaker may have her (his) own goals and intentions, not concerning the child. Therefore, they have to accommodate their behavior to the actual situations, in order “to please or impress the caregiver”. This phase is termed *goal corrected partnership* ([Bowlby, 1979/2005](#)). The attachment between the infant and the parent is strongly associated with the parenting behavior towards the older child or the adolescent ([Karavasilis, Doyle, & Markiewicz, 2003](#)), although this later phase of their relationship, according to [Bowlby \(1979/2005\)](#), is not meeting the criteria of “attachment”, it shall rather be called *affectional bond*. The specific patterns of behavior the parent shows in the rearing of her or his children are called parenting styles or parental rearing styles. [Baumrind \(1967\)](#) determined three types of parental styles, based on how responsive and how demanding the parent is towards the child. The *authoritarian* parent wants the child to comply with her or his demands. S/he renders high control over the child's behavior, favoring those behaviors which are in line with her/his demands and responds punitively to those acts which are against her/his expectations. The authoritarian parent shows low responsiveness to the kid's needs and individual preferences. S/he rather wants the child to follow the structures of conduct decided by him or her, in most of the cases on theoretical or moral grounds.

The *permissive* parent, on the contrary, allows the child to regulate her or his own activities. This parent does not step up to control the behavior of the child. If s/he needs to do that, s/he rather uses explanation or manipulation instead of the authoritarian parent's orders. The *authoritative* parent exerts control but treats the child as an equal partner. Instead of ordering the child, s/he uses reasoning to make the kid understand her or his will. The authoritative partner values the child's

free will and also her or his disciplined behavior. S/he sets standards, but these standards are rather rooted in mutual agreement between her/him and the child than in a pre-set rearing code the child must obey. This tripartite model became the most popular theoretical account of parental behavior ([Darling & Steinberg, 1993](#)). Later, [Maccoby and Martin \(1983\)](#) supplemented Baumrind’s model with a fourth pattern, representing the parental behavior with low levels of both demandingness and responsiveness. This style—termed as *uninvolved* or *neglectful*—refers to the parent who does not set any standard for the child and lets the child the freedom to act as how s/he wants to, but who also does not provide any limitation in terms of affirmation or prohibition, either. This fourfold classification therefore describes all parental styles in the dimensions of responsiveness *versus* unresponsiveness and high *versus* low demandingness. The first dimension can alternatively be called *emotional warmth* (versus *coldness*), caring or support, while the second one is alternatively referred as *control* ([Pereira, Canavarro, Cardoso, & Mendonça, 2009](#)). This classification is depicted in **Table 1**.

Table 1 | Parental rearing styles, based on the works of [Baumrind \(1967\)](#) and [Maccoby and Martin \(1983\)](#)

		DEMANDINGNESS (CONTROL)	
		Demanding (High Control)	Undemanding (Low Control)
RESPONSIVENESS (EMOTIONAL WARMTH)	Responsive (Warm)	AUTHORITATIVE (Warm-controlling)	PERMISSIVE (Warm-permissive)
	Unresponsive (Cold)	AUTHORITARIAN (Cold-controlling)	NEGLECTFUL (Cold-permissive)

Although this model got criticized—for instance, on the grounds that classifying parental behavior along linear variables can lead to a “Procrustean bed” of typology and cause difficulties in interpretation—it is a useful and empirically validated model of parental behavior ([Darling & Steinberg, 1993](#); [Pereira et al., 2009](#)).

1.5. Parental Rearing Style, Family Structure and Mentalizing Ability

The way a parent treats a child has great bearings on the child’s capacity for mentalization. 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 ([Bateman & Fonagy, 2006](#)). Therefore, it seems obvious that the caring and nurturing parent who is emotionally available to the infant and is not overloaded by either the infant’s or her/his own emotions can provide the child with a basis for reflective functioning and ability for symbolic operations which is a pre-requisite for understanding emotions. 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. The parent's rearing style is reflected in the way s/he plays with the child. Restrictive behavior of the parents during play was negatively associated with the child's imaginative activities and positively associated with the child's labile affectivity. Facilitating and cooperative behavior of the parents, in contrast, was related to the kid's ability to employ symbolic activities in the play and to her/his emotional stability. Symbolic capacity and emotional stability in infants predict good mentalization ability ([Keren, Feldman, Namdari-Weinbaum, Spitzer, & Tyano, 2005](#)). The level and quality of parental control and the parents' emotional disclosure, the depth of parental discussion involving affects are strongly connected to the child's possibility to acquire a set of skills in understanding behavior as the result of mentalistic activity ([Fonagy, Gergely, & Target, 2007](#)). Parental "laxness"—a lack of overprotection and a low level of control over the child's behavior—is associated with better outcomes in the child's social cognitive development, including a better performance in Theory of Mind tasks and in understanding of emotions ([Guajardo, Snyder, & Petersen, 2009](#)). It is important to note that these observations were made in behavioral investigations of toddlers or older children. Thus, we can conclude that it is not just the quality of early object relationships, but the caretaker's behavior towards the older child that is also associated with mentalization skills.

Negative experiences in childhood may damage mentalizing skills. Many pieces of evidence suggest that disruption in affective processing can be related to family problems. Those adolescents who report about living in a broken family are more alexithymic than those from intact families ([Joukamaa et al., 2007](#)); alexithymia is related to dysfunctions in the family ([Lumley, Mader, Gramzow, & Papineau, 1996](#)). Fear of separation of the family strongly predicted alexithymic affective processing. Alexithymia acted as mediator between fear of separation and poor relationship with the psychotherapist ([Mallinckrodt, King, & Coble, 1998](#)). I know of no studies on family characteristics and emotional contagion/reading the mind in the eyes. Family dysfunction, including abuse, neglect and parental conflicts, is apparently having a strong negative impact of mentalization: this seems to be a very robust etiopathological factor of borderline personality disorder ([Bateman & Fonagy, 2006](#)). Taking these observations together, it seemed feasible to check whether family issues beyond the parents' style influence mentalization skills and hypnotic response.

1.6. Summary

In the chapter above, mentalization and parental rearing style was presented. It can be concluded that mentalization is a complex process which includes cognitive and affective components and can be theorized as a set or conglomerate of sub-skills that makes the person able to detect, simulate, identify, and empathize with others' mental processes. Therefore, its neural mechanisms are intricate. The assessment of mentalizing capacities, in optimal cases, includes qualitative and quantitative measures and observations of the behavior in social situations. Processes of mentalization are essential in understanding others and ourselves, and our ability to do so is rooted in our affectional bonds to our primary caretakers.

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2. HYPNOTIC RESPONSE AND PARENTAL REARING STYLE

LIKE MENTALIZATION, hypnosis and hypnotic responding are also very complex phenomena. Theoretical models of hypnosis give various answers to the question why people differ in the way they respond to the same hypnotic procedure. In the present chapter, I will first describe how hypnosis models interpret differences in hypnotic capacity, usually denoted with the term “hypnotizability”. Then neural correlates, including its psychogenetic determination and neuroendocrine regulation, and ways to assess the multidimensional hypnotic response will be presented briefly. In the last section of the chapter, findings and explanations on how parental behavior forms hypnotic responding in adulthood will be outlined.

2.1. Hypnotizability

Hypnosis has many theoretical accounts. One of the crucial elements of hypnosis models is how they explain individual differences in people’s responses to hypnosis. Most theories attempt to integrate the variation in hypnotizability, usually by characterizing the high hypnotizable (HH) and the low hypnotizable (LH) population. The majority of experimental hypnosis research projects deal with the HH subjects, or with the contrasts between HH and LH groups ([Heap, Brown, & Oakley, 2004](#)), although medium hypnotizable (MH) subjects have distinct neurophysiological and phenomenological characteristics ([Cardeña, Jönsson, Terhune, & Marcusson-Clavertz, 2013](#)) and are the best candidates for certain experiments (e.g. [Semmens-Wheeler, Dienes, & Duka, 2013](#)). Historically, less attention has been dedicated to the MH group, although they seem to respond to hypnosis with a distinct neurophysiological pattern ([Yargholi & Nasrabadi, 2015](#)). Furthermore, they represent about two thirds of the whole population ([E. R. Hilgard, 1965](#); [McConkey, Barnier, Maccallum, & Bishop, 1996](#); [Költő, Gósi-Greguss, Varga, & Bánvai, 2014](#)).

An observation that is supported perhaps by the most empirical evidence in the hypnosis literature is that responses to a standardized hypnotic induction and set of suggestions show a large variety ([Laurence, Beaulieu-Prévost, & du Chéné, 2008](#)). The term that denotes capacity to experience hypnosis is *hypnotizability*. The terms “hypnotic susceptibility” and “hypnotic suggestibility” are also used, but they bear different theoretic approaches. The majority of the researchers and clinicians accept that hypnosis is an altered state of consciousness (ASC), and to reach this specific state, a specific ability (or set of abilities) is needed. Therefore [Christensen \(2005\)](#) suggests to use the descriptor hypnotizability. In the current thesis, as outlined in the Introduction, hypnotic response (in the broadest sense), hypnotizability (involving behavioral, emotional and phenomenological dimensions), and hypnotic susceptibility (as a term for the variation on hypnotic susceptibility scales) will be used.

For working classification, hypnosis concepts can be divided into four groups. Here, a short overview is given how these groups account for individual differences in hypnotic responding.

(1) The first group (“state theories”) consists of models which conceptualize hypnosis as an ASC; later versions view hypnosis as a phenomenon co-occurring with this ASC, caused or accompanied by a “special process”. These models also postulate that people differ in their ability to reach this specific altered state of consciousness. The most prominent theorist of this school was Ernest R. Hilgard ([1973, 1977, 1991, 1992](#)) who conceptualized the hypnotic state as a dissociative phenomenon. Proneness to hypnosis, according to him, is the ability of a subject to get into this dissociative state and to have experiences that are characteristic to hypnosis. As an operational definition, hypnotic susceptibility is the depth of hypnosis (proportional with the extent of dissociation) as measured by standard suggestions. He and his colleagues emphasized that hypnotic susceptibility is very stable over time and seemingly a very enduring characteristic of the given S, even for a 25 year period ([Piccione, Hilgard, & Zimbardo, 1989](#)); consequently, it can be interpreted as a personality trait. Later representatives of his theory accept this approach; they just differ in where they locate the dissociation within the psychic system.

(2) The second group of theories refuses the idea of viewing hypnosis as a cause or co-occurrence of an ASC. The proponents of these “nonstate” theories think that ASC is a parsimonious explanation of hypnosis: It can be explained with other processes. As these theorists usually propose a distinct social and/or cognitive mechanism of hypnosis, their models are also called “single process” theories, and the common name for their concepts is “social cognitive”. They attribute individual differences to the different ways the Ss react to or take part in the given process of hypnosis. The response expectancy theory of [Kirsch \(1991\)](#) posits that the occurrence of a particular (hypnotic) behavior can be predicted from what the individual expects to be its outcome and what the value of this outcome is. Kirsch emphasizes that Ss are not passive, but rather active participants of hypnosis, and, in fact, they make great efforts to be hypnotized (by volunteering to hypnosis experiments, paying the fee of the hypnotherapist, or buying the tickets to the stage hypnotist’s show, to name a few). An extremist non-state social cognitive approach of hypnotic responses states that hypnotizability is nothing else but compliance to the hypnotist; to posit any other cause or explanatory construct is parsimonious ([Wagstaff, 1991](#)). In an experimental investigation of this approach, however, no association was found between compliance and hypnotic susceptibility, either in the waking state or in hypnosis ([Költő, Lakner, Gősi-Greguss, Bányai, & Varga, 2009](#)).

(3) A third group of theories consists of concepts which are rooted in clinical practice. Professionals with a background in clinical hypnosis seem to be more sensitive to the emotional aspect of the hypnotic interaction than researchers. Maybe this is so because in neutral, laboratory hypnosis sessions the emotional dimension of hypnosis is not expressed as intensively as in therapeutic hypnoses, although under the surface, both the subject and the hypnotist may be affectively involved in laboratory hypnoses as well ([Bányai, Gősi-Greguss, Vágó, Varga, & Horváth, 1990](#)). The most important concept from this group is the clinically inspired model by [Nash \(1991, 2008\)](#). He regards hypnosis as a form of topographic regression, based on the findings of [Freud \(1917/1957\)](#). Regression, in the Freudian sense, is a return from a higher and more mature level of psychic organization to a less advanced form (characteristic of an earlier stage of personality development). It can take two forms: temporal and topographic. Temporal regression refers to the phenomenon that the adult psychic structure reverts to an infantile way of operation, while topographic regression means that the thought structures are replaced by sensory perceptions, the verbal representations by imagery. In hypnosis, thought processes are shifted to a symbolic, primary-process way from the waking, logical secondary-process thinking; affects become easier to access, and the experience of self and agency is disrupted; these are the reasons behind Nash’s conceptualization of hypnosis as topographic regression. In his theory, hypnotic responsiveness is viewed as a propensity to develop an affective bond towards the hypnotist. As the hypnotist represents authority, the bond towards him or her can be interpreted as archaic involvement ([Shor, 1962](#)).

(4) The fourth group of hypnosis theories tries to integrate the above mentioned approaches. Many experimental investigations suggest that individual differences in hypnotic responding cannot be explained solely by the ability to reach ASC, by any single socio-cognitive mechanisms, or by neurophysiological patterns. It is rather a product of the interaction of these features. Such a theoretical stance also provides a possibility of studying hypnosis as a process and as a result of mutual mentalization. Another remarkable attempt to integrate affects into hypnotism is the motivational-emotional model which represents an important route from cognition-dominated hypnosis approaches to an affectively oriented interpretation. In spite of the attempts for resolving the state/nonstate debate and the endeavors to find a common theoretical frame, there is still no complete agreement about what hypnosis is. “Such constructive collaboration will not occur easily, not least because various orthodoxies in hypnosis research will be challenged along the way” ([Gruzelier, 2000, p. 52](#)). The model which seems to integrate the most phenomena and mechanisms of hypnosis is the social-psychobiological theory of Bányai ([Bányai, 1991, 2008b](#)). According to her, hypnosis is an altered state of consciousness which has an adaptive value. This state, labeled “hypnosis”, occurs in a special social context, and emerges from the interaction of the subject and the hypnotist. Emergence of the hypnotic state is influenced by both the S’s and the H’s personality and predispositions, including their attitudes, expectations, motivation, cognitive style, and their relationship. In the social-psychobiological model, hypnosis is not a linear consequence of any behavioral or neurophysiological alteration, but rather it is a dynamic system. In defining hypnosis as an ASC, Bányai accepts the approach of [Kihlstrom \(1984\)](#) who states that hypnosis is not an all-

or-none ASC, but rather an element of a natural category ([Rosch & Lloyd, 1978](#)), which can be defined by converging operations. Kihlstrom posits that changes in four areas or variables indicate a special state of consciousness. These are the induction processes, overt (observable) behavior, subjective experiences, and physiological reactions. The larger the convergence among these four areas, the higher is the chance that the given condition is an ASC. Bányai, as opposed to the above described social cognitive theorists (Sarbin & Coe, Spanos, Wagstaff, and Kirsch), thinks that it is useful to adopt the term “altered state” because it is a helpful frame for organizing our knowledge on hypnotic phenomena. Thus, she follows the so-called “weak” state definition for hypnosis ([Kallio & Revonsuo, 2003](#)). In Bányai’s approach, the converging operations are not just important for the definition of hypnosis, but she postulates that subjective experience is an essential feature of altered consciousness. Therefore in her model not only the traditionally examined (behavioral) manifestations are considered but the subjective experiences occurring under hypnosis as well.

The subject exerts influence on the hypnotist’s behavior and responses and thus contributes to a recursive feedback, resulting in reciprocal interaction and mutual regulation. It is also important to understand the adaptive value of hypnosis. Just as affectional bonds with significant others, hypnosis also serves as a possibility for both the S and the H to attune to each other and synchronize their behavioral and physiological operation, thus attaining a mutual stimulus and arousal regulation ([T. Field, 1985](#)). It shall be recognized that such interactional processes cannot occur without the H and S being able to perceive, understand and process the social stimuli produced by the dyadic partner. The mutual attunement is the result of *interactional synchrony* ([Condon & Ogston, 1967](#)). This term denotes that the participants of an interpersonal situation start to harmonize their micro-movements and even their bodily processes; metaphorically, they start to act “like puppets being moved by the same set of strings” (ibid. p. 229). In Bányai’s opinion, interactional synchrony indicates the two person’s attunement to each other, in order for the S to reach ASC, and that process is associated with the activity of the mirror neuron system. In some hypnosis interactions, the mirror neurons are highly involved, as demonstrated by the intensive interactional synchrony that can often be observed ([Bányai, 2013](#)).

In the social-psychobiological model, hypnotic susceptibility is the level of flexibility shown in a social context. Bányai accepts hypnotizability as a stable trait, but also acknowledges that under certain circumstances at least some Ss’ hypnotic responsiveness can be modified. Yet she warns that even after eliminating the methodological problems for which modification experiments were criticized, another portion of Ss remain resistant to any efforts for changing their genuine level of hypnotizability. She agrees with the opinion of [Gfeller, Lynn, and Pribble \(1987, p. 594\)](#) who state that “there is no intrinsic conflict between the contention that hypnotizability can be modified and enhanced and the notion that certain personal attributes and abilities exist that are stable, enduring and perhaps resistant to modification”. Still, it seems that stable and enduring abilities are in the background of individual differences in hypnotic responsiveness. Bányai concludes that the flexibility HHs demonstrate—based on their capacity for attentional filtering better than LHs—is manifested in a social context, namely in situations labeled as “hypnosis”. LHs may also demonstrate high levels of attentional filtering, but they may be more prone to retain their waking, alert operation of mind in hypnosis situations, letting themselves less involvement to a hypnotic state than HH subjects.

Hypnotizability, as Bányai notes, evolves from the socialization process. Therefore, it is largely influenced by environmental factors, the communicational style of the parents and the ways the infant relates to other people. In a qualitative research, [J. R. Hilgard \(1970\)](#) demonstrated that those who had been brought up in authoritarian families tended to be more, while those who had been reared in a democratic manner seemed to be less susceptible as adults. These findings were supported by our own research on perceived parental rearing style and hypnotizability ([Költő, 2008](#); [Költő & Bányai, 2008](#)) and will be supplemented by further empirical evidence in the present thesis. In line with the social cognitive theories, we have found that hypnotic response is also influenced by contextual factors like time, setting (group *versus* individual) ([Költő, Gósi-Greguss, et al., 2014](#)), or the gender of the hypnotist ([Költő, 2012](#)).

Although many researchers view hypnotic susceptibility as the extent to which the S behaviorally responds to the hypnotic suggestions, hypnotic responding include more dimensions. The most integrative concept which reflects on the complex nature of hypnotizability was developed by

[Shor \(1962\)](#). He completed the two-dimensional model of [White \(1941\)](#), adding to “hypnotic roleplaying” and “trance” a third facet, the emotional loading of the hypnotic response. According to Shor, the behavioral measures (the so-called hypnotic susceptibility scales) developed by his peers are insufficient in tackling the entire hypnotic responding. He does not deny the significance of behavioral responses, though: In his theory, they are based on *role involvement*, the subject’s motivation and ideas about the role of the “hypnotized subject”. This is adequately covered by the behavioral hypnotizability scales. Systematic observation (and assessment) of the hypnotic behavior, however, does not tell anything about the emotions of the S towards the H. Shor coins this dimension *archaic involvement*—a term borrowed from psychoanalysis—, originally referring to the dynamics of libidinal instincts, an unconscious fixation on authority figures, a “nostalgic return” to the passive (infantile) life phase, and a somewhat masochistic desire to obey an omnipotent power. Shor simply uses the term in an operational way, describing archaic involvement as a regressive object relationship towards the hypnotist. Archaic involvement denotes that the hypnotist becomes a superior figure for the subject, for instance, by feelings of love or fear ([Ferenczi, 1909/2002](#)). Through these transference feelings, the S’s core personality³ becomes “involved” in the hypnotic process. The third dimension in Shor’s model is the experiential changes associated with hypnotic changes. He coined the term *trance depth*, which is associated with an alteration in the generalized reality-orientation ([Shor, 1959, 1979](#)): This is the reason for the S to accept experiences as suggested by the H, even if they are counterfactual, like in the phenomena of trance logic ([Orne, 1959](#)). The three dimensions in hypnosis are usually correlated ([Varga, 2004, 2013](#); [Nash & Spinler, 1989](#); [Pekala, 1991](#)), nevertheless, there are cases when they dissociate ([Shor, 1962](#); [Varga, Farkas, & Mérő, 2012](#)). Although hypnosis researchers usually make inferences from a single behavioral hypnotizability measure, the Ss’ hypnotic experiences and emotions towards the hypnotist do not necessarily correspond with his or her response to the behavioral scale. Therefore it is important to measure all three dimensions.

2.2. Neural Correlates of Hypnotizability

Researchers of hypnosis have been dedicating much effort to understanding the neurophysiological mechanisms behind hypnosis and the differences between the brain activities of high, medium, and LH Ss. Hypnosis seems to have specific effects on the brain through two processes: relaxation and absorption ([Rainville & Price, 2003](#)). There seems to be a genuine morphometric difference between HHs and LHs: In a positron emission tomography (PET) imaging study, HHs proved to have significantly larger corpus callosum than LHs ([Horton, Crawford, Harrington, & Downs, 2004](#)). According to the authors, the higher cognitive flexibility and attentional filtering characteristic of HHs (as compared to LHs) can be attributed to this neuroanatomical difference. Although this finding, to the best of my knowledge, has not been verified by a replication study in another hypnosis laboratory, recent quantitative EEG studies support that in the alpha and theta band of electric activity, the extent of bilateral coherence is associated with hypnotic susceptibility ([Shahidi, Abadi, Ofoghi, & Azarang, 2014](#)). It is important to highlight that HHs, under hypnosis, demonstrate a significant increase in the activity of the anterior cingulate (ACC), while in LHs, there is no significant change, compared to the baseline. The increased activity of ACC is associated with a disconnection between the frontal and the dorsal (somatosensory) cortices, which may explain the dissociative phenomena in hypnosis and that HHs have higher dissociative capacity than LHs. In sum, “experimental evidence shows that the hypnotic process produces a brain state that is different from everyday neurophysiology, as shown by evidence of differential effects of attention and relaxation, and by evidence of cognitive and neurophysiological dissociation, which are central features of hypnosis” ([Gruzelier, 2000, p. 51](#)).

In search of the functional brain basis of hypnotizability, [Hoefl et al. \(2012\)](#) compared 12 high and 12 LH Ss. The Ss underwent a 6 minute long functional magnetic resonance imaging

³ Note the correspondence of *core personality* being involved in hypnotic process in Shor’s model, with the *core self* concept of [Stern \(1985/1998\)](#): “An organizing subjective perspective that can be called a sense of core self (...) The infant is with another who regulates the infant’s own self-experience. In this sense, the other is a *self-regulating other* for the infant” (p. 99–102, emphasis in the original).

(fMRI) scanning in the normal waking state in resting position and with their eyes closed. They found that there are significant differences between HHs and LHs in the operation of the so-called salience network (which involves the ACC, the presupplementary motor area, and the anterior insulae). Within that network, the left dorsolateral prefrontal cortex (dlPFC) and the left dorsal anterior cingulate cortex (dACC) showed significantly larger functional connectivity in HHs than in LHs. The salience network takes part in the detection, integration, and filtering of somatosensory, autonomic and emotional information, so the difference sheds light on the reason why HHs perform better when such alterations are needed than LHs. The salience network also mediates between other brain systems (Bonnelle et al., 2012), thus its higher functional connectivity in HHs may reflect their ability to adapt better (sometimes rapidly) to changing situations. Furthermore, the dACC and the dlPFC also showed stronger connection with each other in HHs than in LHs. This may be a sign of co-activation of the salience and the so-called executive-control networks. The connection between prefrontal and anterior cingulate cortices reflects a natural tendency to experience intensive absorption in everyday life. This tendency strongly correlates with hypnotizability. Based on their results, Hoeft et al. (ibid. p. 1069) predict that “The combination of focused attention and conflict reduction that makes hypnosis as an effective form of top-down control over sensation and motor function would involve networks, such as executive-control and salience, during hypnosis among high hypnotizable individuals but not after hypnotic induction among low hypnotizable individuals.”

The theoretical and empirical work of the above mentioned authors give a solid proof to view hypnotic responsiveness as a trait-like ability which manifests itself at a certain level of (neurobiological and psychological) adaptation to the hypnotic situation. Both theories also embrace genetic determination of hypnotic responsiveness, reflected in a strong association between the dopaminergic activity in the frontal brain regions and hypnotizability. In a recent EEG study (Yargholi & Nasrabadi, 2015) using recurrence quantification analysis, it was found that there are remarkable differences in the brain activities among low, medium, and highly hypnotizable Ss. The results suggested that the MHs were more influenced by the hypnotic induction and suggestions than either the LHs or the HHs. LHs were actually not engaged in a hypnotic state, while the brain activity pattern of the highly hypnotizables demonstrated a lack of coincidence with the content of the actual suggestion. While LH subjects do not seem to be absorbed in hypnosis, HHs perform the suggestion in such an automatic way (without cognitive effort) that they can “detach” from the content of the suggestions. Those who belong to the medium hypnotizability range need to concentrate on the content of the suggestion which results in the strongest recurrence pattern across the three groups.

These observations suggest that hypnotizability cannot be understood as a unidimensional personality trait that describes a single aspect of behavior—the proneness to follow the hypnotist’s suggestions—, but it is rather a feature emerging from a complex pattern of neurophysiological changes in the central nervous system. This can explain the strong associations between hypnotizability and postural control (Santarcangelo, Scattina, Carli, Macerata, & Manzoni, 2008), or the by far largely undiscovered relationship between hypnotic response and such neurochemical agents as homovanillic acid or nitric oxide (Santarcangelo, 2014).

Just like ToM, hypnotizability is also partly determined by psychogenetic variations, and it is connected to psychoendocrine regulation. The genetic variability determining dopaminergic activity in the brain influences adult hypnotizability as well as skills related to social cognition and theory of mind. Although the results are not unequivocal—maybe because of methodological differences across laboratories—, hypnotizability seems to be associated with the Val^{108/158}Met polymorphism of the Catechol-*O*-Methyltransferase (COMT) gene (Lichtenberg, Bachner-Melman, Ebstein, & Crawford, 2004; Raz, Fan, & Posner, 2006; Szekely et al., 2010; Presciuttini et al., 2013; Rominger et al., 2014). Neuroendocrine regulation also plays a role in hypnotic responsiveness in a similar manner as in mentalizing skills. In a preliminary study analyzing how oxytocin changes in the S and the H, Varga and Kekecs (2014) found that the level of OXT in the central nervous system of both the subject and the hypnotist was also associated with the perceived harmony of the hypnotic interaction and with the recalled emotional warmth of the Ss’ parents. Administering OXT intranasally seems to heighten the Ss’ hypnotic susceptibility through their increased propensity to follow the H’s suggestions (Bryant, Hung, Guastella, & Mitchell, 2012).

2.3. Assessment of Hypnotic Responding

If we apply the same hypnotic induction and the same set of suggestions to different people, we can observe great differences among them. There are people who are very susceptible to hypnosis. They seemingly go into deep trance (indicated by closed eyes, relaxed posture, and slow speech), they are performing all suggestions of the hypnotist, they report about altered experiences compared to everyday functioning, and hypnosis causes remarkable changes in their central nervous system. On the other hand, there are people who seem to be unaffected by hypnosis. They do not respond to test suggestions, they not seem to be in deep trance (for instance, their speech tempo does not slow down after the hypnotic induction), and they don't report having experienced remarkable differences between their alert state and hypnosis. Most people are inbetween the extremes and are more or less able to experience some hypnotic phenomena and show some behavioral manifestations of the hypnotic state.

At end of the 1950s the observations on hypnotic susceptibility made until then were summarized and integrated with the demands set by contemporary methodology (psychometrics and statistics) on validity and reliability ([E. R. Hilgard, 1979](#)). Ernest R. Hilgard and André M. Weitzenhoffer, founders of the Hypnosis Laboratory at Stanford University, developed the "Stanford scales". These scales, despite criticisms, are still the most popular measures of hypnotic susceptibility. They proved to be psychometrically sound and—based on a large corpus of research across the world—valid. Other measures of hypnotic capacity are evaluated against them. In the last decades, hypnotic measures were proliferating upon the researchers' theoretical position, the somewhat different needs of the clinical application and the laboratory studies, and the various stances about the Ss' experiences ([Perry, Nadon, & Button, 1992](#)). These, beside other measures, include the Stanford Hypnotic Susceptibility Scale, Forms A and B (SHSS:A and B) ([Weitzenhoffer & Hilgard, 1959](#)); the Stanford Hypnotic Susceptibility Scale, Form C (SHSS:C) ([Weitzenhoffer & Hilgard, 1962](#)), the Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A) ([Shor & Orne, 1962](#)); and the Waterloo-Stanford Group Scale of Hypnotic Susceptibility, Form C (WSGC) ([Bowers, 1993, 1998](#)). According to the meta-analysis of [Barnier and McConkey \(2004\)](#), by far the most used measures are HGSHS:A and SHSS:C. The former was applied in 46%, whereas the latter in the 25% of the studies published in the *International Journal of Clinical and Experimental Hypnosis* between 1992 and 2003. Some scholars argue that using solely the HGSHS:A may be acceptable ([Register & Kihlstrom, 1986](#)); others posit that SHSS:C is the best single measure which cannot be sufficiently substituted with HGSHS:A ([Kurtz & Strube, 1996](#)). The best practice—adopted in high quality research projects—seems to be that HGSHS:A is applied as an initial pre-screening instrument, then SHSS:C can be used for a more exact, individual assessment ([Perry et al., 1992](#); [Cox & Bryant, 2008](#)).

It is a question whether hypnotizability can be interpreted as a uniform, unidimensional trait or it is a set or cluster of different abilities. [Woody, Barnier, and McConkey \(2005\)](#) applied advanced factor analysis techniques on a large sample of Ss who had been tested with both HGSHS:A and SHSS:C. They found that in a combined set of the two scales' test suggestions, two factor solutions are acceptable. The first includes four factors: direct motor, motor challenge, perceptual-cognitive, and posthypnotic amnesia; the second one is a unidimensional solution which can be conceptualized as a general personality trait of hypnotizability. These are not exclusive. The uniform 'trait' nature of hypnotizability is supported by the fact that it shows great consistency over time: [Piccione et al. \(1989\)](#) found that the test-retest reliability of HGSHS:A scores over 25 years is .71—hypnotizability seems to be as stable as intelligence. Another evidence for hypnotizability being a personality trait is that in a large sample, HGSHS:A scores converged to fit normal distribution ([Költő, Gósi-Greguss, Varga, & Bányai, 2010](#)). The cluster approach, on the other hand, is supported by that many sub-skills can be differentiated in hypnotic responding which can be categorized into the above mentioned four factors of Woody, Barnier and McConkey.

Direct motor suggestions refer to those in which the H facilitates the performance of a certain movement (e.g., hand lowering). In motor challenge suggestions, the H inhibits the given form of movement, then she or he calls the S to try to perform the movement (e.g. shaking the head). Perceptual-cognitive suggestions aim to alter the experiences and/or thinking of the S in a wide variety of psychological phenomena, including age regression, hypnotically induced dreaming, positive and negative hallucinations, etc. In factor analyses of the HGSHS:A on its own ([E. R.](#)

[Hilgard, 1965](#); [Költő, Gösi-Greguss, Varga, & Bányai, 2013](#)) the posthypnotic amnesia item loaded on the perceptual-cognitive factor. We can expect the Stanford scales' fly or mosquito hallucination suggestion to load on both direct motor and perceptual-cognitive factors, as it involves that the S may shoo the annoying fly or mosquito away. The HGSHS:A and the SHSS:A, B consist primarily of direct motor and motor challenge suggestions, whereas the SHSS:C and the WSGC contain more cognitive-perceptual suggestions.

Although the Stanford scales are more or less accepted by most of the theoretical schools, they just tap into the behavioral dimension of hypnotizability in the belief that manifest behavior reflects the experiences of the Ss. Behavior and experiences, however, may dissociate in hypnosis ([Varga, 2004](#); [Varga, Farkas, et al., 2012](#)), therefore it is important to use measures to assess the phenomenological aspect of the hypnotic state, too. Only the multi-dimensional assessment of hypnotic behavior, experiences, and emotions can cover all the facets of hypnotic response as theorized by [Shor \(1962\)](#).

These methods include retrospective questionnaires, real-time measures, and even qualitative methods. A large collection of them is presented by [Barnier and McConkey \(2004\)](#). From these, the Phenomenology of Consciousness Inventory (PCI) ([Pekala, 1991](#)) and the Archaic Involvement Measure (AIM) ([Nash & Spinler, 1989](#)) shall be mentioned. These are paper-and-pencil questionnaires filled in after the hypnosis session. The former taps into experiences which are supposed to be associated with altered states of consciousness; therefore it can be applied following many experimentally induced ASCs. The latter unfolds the positive and the negative emotions conveyed by the transference towards the hypnotist. In individual hypnosis sessions, both can be easily adapted to measure the hypnotists' experiences and their counter-transference towards their subjects ([Varga, 2004](#); [Józsa, 2012](#)), therefore they may also contribute to understanding hypnosis as an interactive situation.

Nevertheless, the above measures don't address the question how the participants evaluate the situation itself. The Dyadic Interactional Harmony (DIH) scale was developed by [Varga, Józsa, Bányai, and Gösi-Greguss \(2006\)](#) for this very purpose. Using this measure, the S and the H—or two participants of any dyadic interpersonal situations, as demonstrated by [Józsa \(2012\)](#)—can evaluate the intimacy, communion, playfulness, and tension of the given interaction directly.

Another relevant issue is the perceived non-volition under hypnosis. It seems to be one of the most essential specific characteristic of the hypnotic state ([Weitzenhoffer, 1974](#); [Kihlstrom, 2008](#)). The alterations in volition can be assessed by the Sense of Agency Rating Scale (SOARS) ([Polito, Barnier, & Woody, 2013](#)). "Real-time" assessment of various features of hypnosis include the Ss' expectations about how they will perform in the hypnotizability scales ([Benham, Woody, Wilson, & Nash, 2006](#)) and the perceived strength of the given suggestion, indexed by the Ss turning a dial, while under hypnosis ([McConkey, Wende, & Barnier, 1999](#)). A qualitative technique to map the Ss' experiences under hypnosis is the Experiential Analysis Technique (EAT) ([Sheehan & McConkey, 1982](#); [Sheehan, 1992](#)). The extension of the EAT is the Parallel Experiential Analysis Technique (PEAT) ([Varga, Bányai, & Gösi-Greguss, 1994](#)), applied to dyadic hypnosis situations. In the latter method, the S and the H watch the video recording of the hypnosis session independently of each other, and whenever they have anything to say about it, they can stop the playback and make their comments.

This large variety of methods of assessment indicates the complexity and the multi-dimensional nature of hypnosis. We can get a clear picture of the Ss' hypnotic susceptibility (and her or his experiences, alongside with that of the Hs) if we don't rely on a single behavioral measure of hypnotizability, but we supplement it with other methods, tapping into the emotional and the phenomenological aspects of hypnosis as well.

2.4. Recalled Parental Behavior and Hypnotic Response in Adulthood

Mentalization, as we saw in the previous chapter, is rooted in early object relationships. The quality of attachment and affectional bonds with the primary caretaker(s), and the course of socialization of the child also have a strong effect on the future adult's hypnotic responses. According to J. R. Hilgard, the developmental antecedent of adult hypnotizability is the ability for involvement. When

the Stanford scales were developed, [J. R. Hilgard \(1970\)](#) and her colleagues conducted a qualitative research to find predictors for hypnotizability scores. Her hypothesis was that various experiences of involving or absorbing activities of the child will lead to a high level of adult hypnotizability. She and her colleagues made semi-structured interviews with 839 Ss prior to hypnotic susceptibility testing and with 146 Ss after their hypnotizability was assessed. The measure of hypnotic responsiveness was the SHSS:C. The two-hour interviews covered, among other topics, the composition of the Ss' parental family; the relationship and identification with the mother and the father; childhood discipline; special interests and hobbies; attitudes toward play and free-time activities (absorption, involvement, adventuresomeness, etc.); religion; and personal characteristics. The verbatim scripts of the interviews were rated in numerical scales. The raters were also asked to give a prediction for the S's hypnotizability. Supplementary studies with various personality and projective tests were made, but these did not prove to be fruitful in terms of correlations.

According to the findings of the study, those who were highly involved in reading were more likely to be medium or high hypnotizables. Those who showed low reading involvement rather tended to fall into the low range of hypnotic susceptibility. The role of emotional involvement, through empathic and character identification, seemed to be the mediator. Two kinds of children tended to show high reading involvement. Those who reported a loving and warm relationship with their parents and had often observed their parents being involved in reading, showed a "contagion" for reading through identification with the parental behavior. Lonely, severely punished, or coldly treated children, on the other hand, tended to use reading as a form of "escape from reality". Involved readers showed greater imaginative capacity, more vivid fantasies, and a preference for verbal expression.

High hypnotizability was also associated with dramatic and acting experience, with a preference for dramatic and theatrical shows. Interestingly, both in high dramatic involvement and in intensive hypnotic experiences, the Ss emphasized that they felt temporarily being departed from reality, but still preserving more or less monitoring of reality. Both actors and members of the audience mentioned identifying with either the roles or the characters, and those who watched the dramatic shows were susceptible for the "contagious" emotional states of the characters. J. R. Hilgard drew a correspondence between this kind of involvement and the role-taking concept of [Sarbin \(1956\)](#).

Religiously nurtured Ss, and those who had chosen religion for themselves, also had a tendency to be more involved in hypnosis than those who were non-religious, although the statistical relationship was not significant. Religiousness, however, also bears both on the "contagious identification" with the loved parents, if they had practiced religion, and on the "escape from reality" if the S had been raised up in a cold, punishing, or abandoning family. High hypnotizability was also associated with affective arousal-seeking, including sensory stimulation, music, and aesthetic visual appreciation of nature or artworks.

Those who reported to have had imaginary friends or companions in their childhood also scored higher than average on the SHSS:C. These were superego-related entities: playmates or non-playmates serving other complementary ego functions (like sexual objects, audience, or a companion shared with an adult). According to J. R. Hilgard, these phenomena can be interpreted as special cases of dissociation, where one aspect of self-awareness becomes separated from the core of the self. Imaginary companions can be placed between "alteregos" and "multiple personality". Note, however, that these companions also serve many functions that [Winnicott \(1953\)](#) attributes to transitional objects. It is possible that those children are prone to use these "internal" transitional objects who would later easily enter hypnosis as a transitional space ([Baker, 2000](#)) in which the hypnotist may embody or motivate ego functions of the transitional object. Transitional spaces also have the qualities of pretend mode and psychic equivalence ([Bateman & Fonagy, 2006](#)) that, as we have seen in the previous chapter, are essential in the development of mature and sound mentalization.

These and other aspects of involvement (e.g., adventuresomeness and sport activities) made the Hilgards formulate the "alternate-path" theory of hypnotizability: Basically, it refers to the fact that different experiences of involvement can lead to high susceptibility to hypnosis. For instance, if one has a rich and vivid fantasy, it may make her highly involved in hypnotic imagery, without being adventuresome at all. Another S, not prone to fantasizing, may be very adventuresome: His

sensation-seeking will drive him to be involved in hypnosis and gain new experiences that way. This, according to J. R. Hilgard, also means that HHs have a *transference readiness*:

As a result of many experiences in the past, the susceptible subject comes to hypnosis with a well-developed and relatively fixed ability to participate in fantasies [or adventures] stimulated through outside sources (...) The words of the novels he has read, the voices of the actors he has listened to, as well as the stimulation provided by music or beauty in nature, have aroused appropriate fantasies with feeling because of the repeatedly experienced involvements. If our interpretation is correct, the voice of the hypnotist (*any* hypnotist whom he is willing to trust) will capitalize on this established background of imaginative involvements” (J. R. Hilgard, 1970, p. 168, [emphasis in the original](#)).

One of the most important findings of this large-scale qualitative research was that hypnotic responding is partly determined by parental behavior. J. R. Hilgard attributes these effects mainly to identification. According to her, the parent’s involvement is observed by the child, and on the basis of a loving, warm relationship, these parental behaviors are contagious: The child will be prone to identify with them and act accordingly in her or his adult life.

The link between fantasy-proneness and high hypnotizability can also be attributed to severe punishment or cold, dismissive, abandoning parental behavior. [Rhue and Lynn \(1987\)](#) found that their highly hypnotizable Ss were significantly more likely to report about being severely punished in their childhood than the LHs. Fantasy-prone children used fantasizing to block the pain of punishment or to take an imaginary revenge on the punisher. This suggests that fantasy has compensatory and adaptive functions. Fantasizing is a dissociative state ([Waldo & Merritt, 2000](#)), like hypnosis. Dissociation seems to be their common background mechanism.

Both Hilgard’s and Lynn & Rhue’s findings were replicated with the quantitative investigations of [Költő \(2008\)](#) and [Heller \(2011\)](#), where the link between memories about parental behavior and hypnotizability was examined. We used the short form of the Eгна Minnen Beträffande Uppfostran (‘My Memories of Upbringing’, EMBU) questionnaire ([Arrindell et al., 1999](#)), a self-report measure consisting of 23 items to assess the Ss’ retrospective evaluation of their parents’ behavior towards them. The items are organized into three factors: overprotection, emotional warmth, and rejection. To assess punitive parental behavior, we constructed a fourth, operational factor from some of the items on overprotective (controlling) and dismissive parental behavior. Maternal overprotection and punishment correlated with hypnotizability (assessed with WSGC), both parents’ punitive behavior correlated with the negative aspect of ASC and archaic involvement (assessed with PCI and AIM). The correlations were low (around .3), but significant ([Költő, 2008](#)). In another investigation ([Heller, 2011](#)), the LH men and the HH women reported more frequent punishment than Ss in other hypnotizability ranges. Only children were more susceptible to hypnosis than those who had siblings. In addition, we have noticed that a remarkable proportion of the subjects made side-notes on the EMBU questionnaire, indicating that they were not raised by their biological parents or in a traditional two-parent family. Parental divorce or living in a dysfunctional family may lead to disturbed attachment ([Marvin & Stewart, 1993](#)). Indeed, hypnotizability seems to be related to “problematic” attachment styles ([Peter et al., 2011](#)). Another issue is that although the EMBU (and other measures of parental behavior) reflect on how the parent treated the child, but it does not necessarily correspond with the child’s emotions towards the parents. Family composition and affect for the parents may also contribute to adult hypnotizability.

To the best of my knowledge, no studies were conducted until now to check whether family structure (intactness of the family) and person of the primary caretaker(s) (e.g., biological parents, one parent, and her/his life partner, other persons) influence hypnotic response. These findings can be supplemented with examinations of hypnotizability and attachment in adult relationships. In the research of [Peter et al. \(2011\)](#), participants’ hypnotic susceptibility and their relationship style was assessed. It was revealed that anxiety and lack of trust were moderately but significantly related to hypnotizability. Those with insecure—preoccupied, dismissing, or fearful—attachment style scored significantly higher on the HGSHS:A than those who perceived their relationships secure. Peter and his colleagues attribute this finding to the possibility that insecurely attached individuals may tend to, or perhaps even depend on the rapid detection of social stimuli and messages of relevant others,

and react to them by intuition. They may seek for intimacy in others, attempting to reduce their separation anxiety.

In these research projects, less emphasis was given to LHs; no specific pattern of parental behavior was linked to low hypnotic susceptibility in adulthood. Maybe both cold-restrictive and warm-authoritative parental behavior can be a contributor to low adult responsiveness. For instance, a severely punished child may be bound to constant monitoring of the environment and may keep a suspicious attitude towards every situation where the control might be taken away from her/him, like hypnosis. A child raised in an authoritative manner, on the other hand, may keep her/his “independent” and critical observation and be able to decide not to go into hypnotic trance. Both of these hypothetic developmental pathways may lead to low adult hypnotic susceptibility, in behavioral, emotional, and phenomenological dimensions as well. Neurophysiological differences may also interact with parental rearing style. More research is needed with the participation of LH subjects to understand this question better.

Based on the developmental formation of mentalization skills and their strong connection with affectional bond to the primary caretakers, I hypothesize that hypnotizability is also related to mentalization. Apparently, children who were raised in warm and loving families experienced contingent and marked parental feedbacks, thus they were able to develop highly functioning reflective skills. Therefore they might perceive hypnosis as a secure situation and they can easily let themselves experience the regressive, dissociative hypnotic state. As they can understand the hypnotists’ social cues and suggestions and they can mentalize their own state, it is easier for them to get into an ASC. Children who had an insecure attachment, on the other hand, may keep their desperate need to constantly monitor their environment and try to predict their interactional partner’s behavior. Unpredictable or aggressive behavior of the primary caretaker may also lead to the use of dissociative strategies as a coping mechanism ([Madigan et al., 2006](#)). Those adults who experienced such behavior in their childhood may also mentalize the suggestions of the H and mobilize their dissociative capacity, leading again to high hypnotizability. On the surface, groups show largely involved hypnotic behavior, nevertheless, they may have opposite experiences under hypnosis, and they may also have different emotions towards the hypnotist.

2.5. Summary

In this chapter first the theoretical approaches to the individual differences in hypnotic susceptibility were presented. So far, the theory that integrates the most phenomena of hypnosis is the social-psychobiological model. In this approach, hypnotic susceptibility is a relatively stable trait which has psychogenetic determination, but may also be influenced by contextual factors. High hypnotizability can be understood as a flexible adaptation to the contextual features of hypnotic situation and the content of the actual suggestions. This is in line with the neurophysiological studies of hypnosis that found remarkable differences between the brain activity of HH and LH subjects. High hypnotizability seems to be associated with an increased ability for relaxation, absorption, and dissociative propensity. It is also related to oxytocin regulation, which may help the hypnotist and the subject to attune to each other. Hypnotizability, however, is a multidimensional construct. Although many researchers refer to hypnotic susceptibility as a behavioral response to a standardized set of hypnotic suggestions, it also includes the emotional bond (transference) towards the hypnotist, and the extent of the phenomenological changes related to the altered hypnotic state the subject experiences. Therefore, hypnotic responses are assessed with several kinds and forms of measures. Adult hypnotic susceptibility seems to be influenced by the way the subject was raised and, in interrelation with parental rearing style, by her or his ability to understand the hypnotist’s mental states (emotions, expectations etc.). In the next chapter, I will summarize the key findings that demonstrate that parental rearing style has a direct link with hypnotic responding, and that mentalization skills mediate between them.

3. MENTALIZATION AND HYPNOTIZABILITY IN THE CONTEXT OF PARENTAL REARING

THE THEORETICAL MODELS AND EMPIRICAL FINDINGS I presented in the former chapters—although they do not directly refer to the two concepts’ relationship—amply support that hypnotic susceptibility is based on the subject’s and the hypnotist’s ability to perceive, recognize, and understand (in one word, to process) the mental states of the hypnotic partner. This relationship, however, is not necessarily and not entirely linear. Besides that, other features and conditions may contribute to high and low hypnotic responsiveness as well. For instance, a subject may understand the hypnotist’s expectations and suggestions, but she may not be co-operative if the hypnotist does not give a good impression on her. Another subject may not have an entire understanding on the whole situation, but may be overwhelmed by hypnosis (and therefore he will experience dissociation, resulting in carrying out the suggestions).

Previous research findings also suggest that dimensions of hypnotic responding are also associated with affective processing skills that can be interpreted as elements or “facets” of mentalization. These include emotional contagion—our propensity to mirror the emotional expressions of others ([Hatfield et al., 1994](#)), and thus share in their emotional states—, and empathy, our ability to take the perspective and share the feelings of others ([Wickramasekera & Szlyk, 2003](#); [Antonelli & Luchetti, 2010](#)). The first part of this chapter will present these findings. In the next section, I will briefly describe the theoretical arguments for a hypothesized link between the alexithymia–lexithymia continuum and hypnotic susceptibility. Alexithymia denotes the difficulty or inability to identify, express, and elaborate our emotions ([Taylor, Bagby, & Parker, 1997](#)), and “lexithymia” means that someone masters these skills. As we have seen in Section 1.3 on the assessment of mentalization and parental rearing style, these constructs—alongside with the capacity to make inferences about another person’s emotions from her or his facial signs—can be considered as “facets” or sub-skills of mentalization. We have a growing number of empirical findings that these skills are associated with each other and with dimensions of hypnotic capacity. The third section will list the overlaps and commonalities in the neural mechanisms of mentalization and hypnotizability, including their shared genetic and neuro-endocrine background. In the last section, I will argue that parenting style, mentalization skills, and hypnotic responding are associated in an interactive way, and they represent a causal system.

3.1. Hypnosis, Emotional Contagion, and Empathy

Our capacity to perceive and share the emotions of others, *empathy*, can be understood as a dimension or sub-skill of mentalization. Alternatively, empathy is the process in which we represent others’ behavior within the self to understand another life which is foreign to us ([Antonelli & Luchetti, 2010](#)). Empathy includes conscious feelings and thoughts, but they are preceded by an automatic, unconscious imitation of the observed person. The anterior insula and the rostral ACC play part in the empathic concern for other people’s pain ([Singer et al., 2004](#)), but it seems that we understand the emotions of others through a “mapping” mechanism: Sensory information in the motor structure of the brain is merged with emotional processing and subsequently with cognitive decoding. This mapping process is directed by the mirror neuron system ([Antonelli & Luchetti, 2010](#)).

According to [Freud \(1922/1949\)](#), our ability to take and imitate others’ emotions, the “unconscious mimicry”, is related to hypnosis. Freud, comparing the absorbing effect of love and hypnosis, concludes that “There is the same absorption of one’s own initiative; no one can doubt that the hypnotist has stepped into the place of the ego ideal” (p. 37). This notion has been verified by the neuroscientific underpinnings of the simulation theory ([Jeannerod & Pacherie, 2004](#)). According to the simulationists, empathic emotions are triggered by a quick, unconscious, automatic process of mimicking or synchronizing with other people’s emotional signals, including facial expressions, suprasegmental (prosodic) features of vocalization, postures, movements, and forms of instrumental emotional behavior. This phenomenon, called *emotional contagion*, seem to produce

an emotional state in the person similar to those whom she or he observed ([Hatfield et al., 1994](#)), and help them make inferences about the other person's emotions ([Levenson & Ruef, 1997](#)). The mirror neuron system seems to be essential in emotional contagion ([Cardeña et al., 2009](#)), and this "contagious" feature of affects may also contribute to mentalize other people's actual state.

[Antonelli and Luchetti \(2010\)](#) emphasize that hypnotic interaction also requires mutual empathic involvement. They raise the example of Erickson, who sometimes surrounded "resistant" (i.e., LH) patients with other subjects who were highly susceptible to hypnotic trance. Observing their responses to Erickson's suggestions facilitated these low-susceptible Ss to follow their fellow-subjects. Erickson's other techniques were also tailored to the given patient, and he emphasized the role of the hypnotist's attunement. This also explains why Erickson did not attribute particular importance to hypnotizability. He, in fact, created the hypnotic response that was needed for the patient's healing. These techniques, state Antonelli and Luchetti, are clear examples of how the mirror neuron system is involved in developing (and strengthening) hypnotic responses.

There are also experimental proofs that empathy's emotional and behavioral aspects are related to hypnotizability, as measured by standard scales. [Wickramasekera and Szlyk \(2003\)](#) assessed their Ss' hypnotic susceptibility with HGSHS:A, and subsequently they administered two questionnaires: Interpersonal Reactivity Index (IRI) and Tellegen Absorption Scale (TAS). The IRI ([Davis, 1983](#)) measures the global concept of empathy as a conglomerate of four factors: fantasy, which refers to the Ss' proneness to identify with fictive characters; empathic concern, which refers to feelings of compassion for another person's suffering; perspective-taking, the ability that one can share the view of others to understand them; and personal distress, which refers to the extent of stress one feels over another's suffering. Note that identification is a central concept in J. R. Hilgard's ([1970](#)) developmental model, while perspective-taking is closely related to the role-taking hypnosis concept of [Sarbin \(1956\)](#). Wickramasekera and Szlyk hypothesized that a mediator between hypnotic susceptibility and empathy is absorption; that was the reason for administering the TAS ([Tellegen & Atkinson, 1974](#)). A significant correlation ($r = .41$) was found between hypnotizability and total empathy score; correlations between IRI subscales and susceptibility, with the exception of empathic concern, were not significant. As proven by a multiple hierarchical regression, empathy's influence on hypnotizability was partly mediated by absorption, but 7% of the variance of hypnotic susceptibility could be explained solely by empathic concern. The results may be biased by context effect ([Council, 1993](#)), as empathy and absorption were measured after the HGSHS:A sessions, meaning that Ss' responses on the questionnaires may have been influenced by their experiences of hypnosis. It can still be concluded that those who showed high empathy scores were more likely to be HHs, maybe because they are better in understanding the hypnotist's nonverbal social cues.

A similar investigation was carried out by [Cardeña et al. \(2009\)](#). They were interested whether the propensity for emotional contagion is related to different aspects of hypnotizability, including responses to motor *versus* perceptual-cognitive suggestions, and phenomenological aspects of hypnotizability. They also attempted to control context effect. In the first phase of the study, the HGSHS:A (consisting primarily of direct motor and motor challenge suggestions) was administered, then the Ss filled in the Subjective Experiences Scale (SES) ([Kirsch, Council, & Wickless, 1990](#)), a 12-item self-report measure on how voluntary their performance on the test suggestions of the Harvard Scale they felt to be, and the ECS ([Doherty, 1997](#)), a 15-item self-report measure which assesses how contagious positive and negative emotions are for the S. Emotional contagion showed the same strength of association with both HGSHS:A ($r = .33$) and with SES ($r = .33$), both correlations were significant. ECS, as we will see in Section 6.3, contains a negative and a positive subscale; hypnotizability had a somewhat stronger correlation with the former than the latter.

In the second part of the above cited study of Cardeña and his colleagues, the measure of hypnotizability was WSGC, containing many perceptual-cognitive suggestions; phenomenological changes were assessed by the Inventory Scale of Hypnotic Depth (ISHD) ([P. B. Field, 1965](#)), right after the hypnosis session. The ISHD is similar to the PCI presented in Chapter 2, but somewhat shorter. The ECS was administered 3 months later, without any reference to the hypnosis testing. As expected, WSGC and ECS scores were not correlated, but in spite of the long time and the lack of connection between the two occasions, ECS total scores were quite strongly correlated with the

ISHD scores ($r = .45, p < .001$). These findings suggest that emotional contagion is more connected to the motor aspect and to the phenomenological dimension of hypnotic responding than to the cognitive-perceptual changes under hypnosis, which is supported by the automatic and motion-related nature of emotional contagion. It is a pity that controlling context effect and assessing different sets of hypnotic responding (even different sides of hypnotic experiences) were not separated in this setting.

From Cardeña et al.'s results, however, we can infer that (1) the unconscious and automatic processes of mentalization seems to have a stronger association with motor responses to hypnosis than to conceptual changes; (2) mentalization may be associated with phenomenological changes under hypnosis as well, maybe even stronger than with behavioral responses; (3) the assessment of the phenomenological aspect should not be confined to the perceived (in)voluntariness of hypnotic behavior, but should cover various hypnotic experiences.

The above presented research findings are limited by that mentalization skills of the Ss were assessed with self-reported measures. Hypnotic attunement can be studied, however, by nonverbal characteristics of the S and the H as well. One of these research directions is studying the changes in the participants' prosody under hypnosis. Prosody or supra-segmental characteristics of vocalization involve the rhythm, the stress, and the intonation of speech. They usually cannot be influenced consciously (it is a skill of trained actors and professional speakers); therefore, they might be "better" and more genuine indicators of the speakers' emotional state than any self-report. Although these features do not provide grammatical or semantic information, they are a rich source of information about the interactional partner's current mood, arousal, intention, and even such complex phenomena as irony, sarcasm, humor, compassion, etc. Therefore, prosody is understood to be as one of the information sources for mentalization ([Achim, Guitton, Jackson, Boutin, & Monetta, 2013](#)).

The role of prosodic features of the H's and the S's speech in hypnosis was examined by [Gösi-Greguss, Bányai, Józsa, Suhai-Hodász, and Varga \(2004\)](#). Based on the observation that in standard hypnosis sessions (administering SHSS) the S gets suggestions for relaxation and in due course, the H also often experiences relaxation ([Horváth, Bányai, Varga, Gösi-Greguss, & Vágó, 1988](#); [Bányai et al., 1990](#)), Gösi-Greguss hypothesized that in dyadic hypnosis sessions both participants' voice would become lower, deeper, softer, and their speech would become more monotonous and softer than in the waking alert state. Another hypothesis was that the Hs' prosodic features would be related to the nature of the test suggestions (e.g., challenging suggestions would facilitate tenseness in the H's voice), and that both participants' prosody may vary as a function of the S's hypnotic susceptibility. To test these hypotheses, she audio-taped standard SHSS:A sessions, and analyzed the records for phonetic and acoustic characteristics of the hypnotist's speech.

Although Gösi-Greguss found that both partners' voice characteristic showed significant differences from their waking alert speech, the "relaxational" hypothesis could not be fully verified. Hypnotists seemed to have unconsciously *accommodated their voices* to the given subject's emotional state or trance depth. This process can be understood as a mutual mentalizing process, which may be manifested—among other psychological features—in emotional contagion and empathy. Therefore the extent of the S's participation, manifested in behavioral hypnotizability, trance depth, and archaic involvement, may be influenced by her or his mentalization skills "brought" into the hypnotic situation.

3.2. Hypnotic Susceptibility and Alexithymia

If it is true that those will be highly hypnotizable who access easily both of the hypnotist's and their own mental states, we can expect that the level of the subject's *alexithymia* correlates negatively with her or his hypnotic susceptibility. Alexithymia is considered to be a personality trait that comprises (1) difficulty in identifying feelings and emotions and in differentiating between the emotion and the bodily symptoms of emotional arousal; (2) difficulty in verbalizing emotions and sharing them with others; (3) reduced imaginative ability, paucity, and scarceness of fantasies; (4) externally-oriented and stimulus-bound (alternatively, "pragmatic") thinking ([Nemiah, Freyberger, & Sifneos, 1976](#); [Taylor, 1994](#); [Taylor et al., 1997](#)). In a recent review we argued that there are many

processes that connect hypnosis and alexithymia, including dissociation, fantasizing, variations in the COMT gene, oxytocin, empathy, and operation of the anterior gyrus cingulum ([Költő & Bányai, 2015](#)). Apparently, the ability to access one's emotions—termed as “lexithymia” ([Moormann et al., 2008](#))—can be understood as a facet of mentalization. This is the reason why measures of alexithymia are listed under the means of assessment of mentalization ([Luyten et al., 2012](#)).

Most of the above listed overlaps indicate that hypnosis and alexithymia are oppositely directed processes, meaning that higher alexithymia is associated with lower capacity to be involved in hypnosis. The relationship, however, is not as unequivocal as one could first think, since some alexithymic individuals tend to experience high dissociation. If alexithymic processing was caused by maladaptive parental behavior (for instance, the parent too often and too severely punished the child), the person may be afraid of any interpersonal situations where others may treat her/him negatively. As we have seen in the previous chapter, they may also be prone to use dissociative defense mechanisms to cope with these situations. They may, however, avoid facing these negative emotions. This pattern results in alexithymic affective processing and high hypnotic susceptibility in the same time. We can speculate that both non-alexithymic (“lexithymic”) and highly alexithymic people may show higher hypnotic susceptibility than those who are in the range of possible, sub-clinical alexithymia. The former can access their inner states and empathically understand the hypnotist's suggestions, so it is not difficult for them to be absorbed in the hypnotic state. The latter, on the contrary, may feel stressed and disoriented in hypnosis, but the structure and the explicit social cues of the hypnotist may help them to “know their way around” in the hypnotic situation, thus they will be able to follow the suggestions. How we might catch the differences between these subgroups is maybe not that we compare their behavioral hypnotic susceptibility scores, but rather examining their negative and fearful emotions towards the hypnotist (archaic involvement) and towards the hypnotic state itself (phenomenological experiences). For those who are in the subclinical range of alexithymia, both ways of participating in hypnosis are troublesome. It is difficult for them to access their actual state, but they may not be dissociated “enough” to rely on the structured nature of the hypnotic situation. Therefore we hypothesized that alexithymia and hypnotizability are in a quadratic, U-shaped relationship, with lexithymics and highly alexithymics showing higher hypnotizability scores than those who are in the subclinical range of alexithymia ([Költő & Bányai, 2014](#)). The results will be presented below.

Please note that these findings also correspond with the developmental roots of mentalization. [Thorberg, Young, Sullivan, and Lyvers \(2011\)](#) subjected 10 studies addressing the relationship between parental care and alexithymia to meta-analysis. They found that while parent's caring behavior lowered the child's odds to be alexithymic as an adult, their overprotectiveness heightened these odds. The internal representation of cold and overprotective parents—corresponding with the authoritarian style in Baumrind's model—is strongly associated with alexithymia in adulthood ([Kooiman et al., 2004](#)). Disapproving, dismissive, and “laissez-faire” parenting style also showed significant correlations with alexithymia; on the other hand, the recalled “emotional coach” style of the parent showed an inverse association with alexithymic emotion processing ([Gianesini, 2012](#)). The “emotional coach” parent can access both her/his and the child's emotions, and can adequately handle them. This parental style is associated with children's enhanced ability to cope with emotionally loaded situations ([Gottman & Declaire, 1997](#)). The emotional coach style shows an overlap with the “responsive” (emotionally warm) parenting styles in Baumrind's and in Maccoby & Martin's model, since it reflects that the child's emotions are understood and returned by the parent. If a child experiences secure attachment and gets marked and contingent feedback, it will be easy for her/him to access and mentalize her/his emotions. If, on the other hand, the child's caretakers are overwhelmed and stressed (which can be manifested in overprotective behaviors), the child may not get marked and contingent reflection on his/her emotional states, which will lead to difficulties or an inability to mentalize his/her inner world. This, as we have seen, may be independent from her or his attempts to understand the external world. It may be the reason why both lexithymic and alexithymic adults can enter the hypnotic state. The difference between their mentalization may be manifested in their experiences. Hypnosis may be a more negative and confusing situation for those with insecure attachment experiences (and a hindrance in mentalizing their own states) than for those who bring a secure relational representation to the hypnotic interaction.

3.3. *Overlaps in the Neurosignatures of Hypnosis and Mentalization*

Hypnosis and mentalization are rather complex phenomena. This complexity is reflected in their neural background. Neither constructs can be related to the activity of one single brain area; rather, they are *neurosignatures* emerging from synchronized and systematic changes in several cortical and subcortical regions. The term “neurosignature” was first applied to pain by [Melzack \(2001\)](#), and it denotes a pattern of neurophysiological activity emerging from a widely distributed neural network. It sounds obvious that two psychological processes that are so intricate will inevitably show largely overlapping neurosignatures. The assumption that the two constructs have common roots, however, is further supported by psychogenetic and neuroendocrine evidence. The analysis of their neural correlates, presented in the previous two chapters, revealed three salient overlaps: the mirror neuron system, the functional combination of the prefrontal and the anterior cingulate cortices, and a right hemispheric dominance.

As we have seen, the mirror neuron system is activated both under hypnosis and in mentalization. Different hypnosis styles are associated with different levels of empathy ([Bányai, 1998](#)). This activation seems to be especially strong in maternal hypnosis, which is characterized by high amount of interactional synchrony and empathic mirroring. Note, however, that certain empathic (affective) involvement is also needed in paternal hypnoses and cognitive understanding of other people’s mental state. This imitative process is unconscious and automatic, and may influence the entire world of interpersonal situations ([Chartrand & Bargh, 1999](#)), as reflected in the concepts of empathy and emotional contagion, which seems to be related to hypnotic responsiveness.

Perspective taking, knowledge of the world’s things, projecting the future, and understanding other minds foreign to us require the activation of many other brain regions near the mirror neuron system. These regions include different parts of the prefrontal cortex (PFC) and the adjacent paracingulate region, the anterior cingulate cortex (ACC). The PFC and the ACC play a role in a wide variety of ToM tasks that can be understood as operational dimensions of mentalization. Such tasks include 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](#); [Amodio & Frith, 2006](#)).

Note how important these activities are in hypnosis, which requires an understanding and constant monitoring of the hypnotist’s mind (reflected in her or his gestures, movements, facial expressions, vocalization, specific verbalization, and suggestions). The ventral part of the ACC seems to be involved in “hot” processes that are automatic, non-conscious, rapid, and covering the affective dimension. The dorsal ACC, on the other hand, is involved in “cold” processes that are conscious, analytic, take more time, and are cognitive by nature. In hypnosis, such activities are also utilized. Both the prefrontal cortex, especially its dorsolateral part (dlPFC) and the ACC are strongly involved in hypnosis. The two regions show greater functional activity in HHs than in LHs. This may reflect HHs’ better ability to filter the stimuli from the external world and to adapt to changes in (interpersonal) situations better ([Hoeft et al., 2012](#)). This suggests indirectly that HHs may be better in hot mentalizing processes than LHs.

The third neural commonality between the process of mentalization and hypnosis seems to be a specific hemispheric pattern. Although the “binarizing” of the brain should be avoided ([Gruzelier, 2006](#)), in both phenomena the right hemisphere seem to play a leading role. For instance, in healthy children’s mentalizing, the right medial prefrontal cortex, the right dorsolateral prefrontal cortex (dlPFC), bilateral superior temporal sulcus (with right dominance), the right inferior parietal cortex, the right temporal pole, bilateral fusiform gyri, bilateral visual association areas, and the left cerebellum showed significant activation, as measured by fMRI, when the children observed and interpreted different actions ([Ohnishi et al., 2004](#)). These and earlier results show a right hemispheric preponderance during mentalization over “non-mentalizing” activity (when the attention is not directed to others’ or one’s own mental states). HHs seem to effectively reduce their left hemispheric activity in hypnosis, resulting in a right predominance ([Gruzelier, 2006](#); [Naish, 2010](#)). Highly hypnotizables, however, are more flexible in developing a hemispheric preponderance according to the content of the actual suggestion ([Bányai, Csépe, & Mády, 1995](#)); lexithymics can integrate the global, nonverbal emotional information produced in the right hemisphere and its higher-level cognitive analysis performed by the left hemisphere ([Bermond, Vorst, & Moormann, 2006](#)).

In the previous chapters, I presented findings on the associations between oxytocin release, mentalization and hypnosis. OXT seems to play a part in all mediator processes, especially empathy and alexithymia, which were listed in the previous sections. We have good reasons to believe that the extent of adult OXT release is strongly influenced by early attachment experiences. I hypothesize that oxytocin has an essential mediator function between hypnosis (and all other social interactions) and mentalization. In the presence of high central OXT, people tend to have a better understanding of both the interactional partner's and their own mental states, which results in a deeper involvement in hypnosis—reflected in hypnotic behavior, experience and transference as well.

Oxytocin and cortisol changes under hypnosis, the three dimensions of hypnotic response, and the Ss' memories of their parents' behavior were registered in the study of [Varga and Kekecs \(2014\)](#). As mentioned in the previous chapter, they found that OXT-release in the central nervous system of the hypnotist is also associated with the subjects' perceived harmony of the hypnotic interaction. This is strong evidence for the notion that the interactional partner's OXT also helps the mentalization process. According to [Zelinka, Cojan, and Desseilles \(2013\)](#), the OXT changes in hypnosis can be interpreted as a function of early relationships. They hypothesize that those suggestions which aim to correct the early, insecure attachment patterns can modulate endogenous OXT release. Therefore they have a beneficial effect on both the therapeutic alliance between the hypnotherapist and the patient, and on the actual object relationships of the patient. Maybe it is not too speculative to assume that these suggestions, through the mediation of OXT, result in a better access to the patients' emotions by the means of easier mentalization and reduced alexithymia ([Költő & Bányai, 2015](#)). Administering oxytocin results in higher hypnotizability, and this effect could not be attributed to OXT changing the Ss' stress or trust ([Bryant et al., 2012](#)).

Oxytocin also influences alexithymia and empathy. In the study of [Luminet, Grynberg, Ruzette, and Mikolajczak \(2011\)](#), alexithymic and non-alexithymic Ss were randomly assigned into OXT or placebo groups. Before and after administering the OXT/placebo, they were examined with the RMET, being a sensitive indicator of non-verbal emotion recognition ([Baron-Cohen et al., 2001](#)). Non-alexithymic (i.e., "alexithymic") persons performed well on the RMET, independently of the effect of OXT or placebo; for alexithymics, administering OXT led to a significant improvement in emotion recognition. These results suggest that oxytocin modulates ("treats") both low hypnotizability and high alexithymia. This effect may be the result of OXT improving the recognition and identification of social (affective) stimuli; in other words, OXT enhances the ability for mentalization.

The fourth neural overlap of hypnotic susceptibility and mentalizing ability is the psychogenetic determination of the dopaminergic activity of the central nervous system. Although the results are ambiguous, it is feasible that the gene that regulates the level of interneuronal Catechol-*O*-Methyltransferase (COMT) enzyme has a central role. COMT metabolizes dopamine; therefore high level of the enzyme leads to better attentional abilities than low levels of COMT. A variation of the Val^{108/158}Met codone of the COMT gene is associated with both mentalization and hypnotic susceptibility: The Valine allele has an additive effect, meaning that those who carry the Val/Met allele perform better in ToM tasks and show larger hypnotizability than those who have Met/Met, but Val/Val carriers outperform them. These, however, are preliminary results, and the findings vary as a function of the measures and the samples ([Lichtenberg et al., 2004](#); [Raz et al., 2006](#); [Szekely et al., 2010](#); [Presciuttini et al., 2013](#); [Rominger et al., 2014](#)).

The above neural, neuroendocrine, and neurogenetic overlaps, however, provide theoretical support to the hypothesis that hypnosis and mentalization are linked together. Indeed, I hypothesize that certain developmental pathways lead to high hypnotizability through the mediating effect of mentalizing skills.

3.4. Parental Rearing Style, Mentalization and Hypnotizability

An understanding the hypnotist's (and the subject's) mental state seems to be essential for hypnosis. Lack of mental capacity to understand the hypnotist's intention is considered to be a contraindication for hypnotherapy ([Molnár, 2006](#); [Owens, 2012](#)), although even mentally handicapped chil-

dren can be brought to hypnosis. Nevertheless, even [McCord \(1956\)](#), when attempting to hypnotize children with Down syndrome, emphasized that those children who performed the hypnotic suggestions, were the ones who were known to be co-operative in their everyday lives as well. Susceptibility to hypnosis, at least to some extent, is related to intelligence, especially to its verbal subskills ([Geiger, Peter, Prade, & Piesbergen, 2014](#)), but it seems to be a matter of *emotional* intelligence rather than that of IQ.

Although the social-psychobiological model emphasizes the role of mutual attunement of hypnotized subject(s) and hypnotist, it does not explain how the participants perceive, understand, and elaborate each other's mental states. Still, it has been proven that at least in the so-called "maternal" style hypnosis the hypnotist responds to the subjects' minor behavioral signs very sensitively. In "paternal" hypnosis, the hypnotist attempts to analyze what is happening in the subject at a cognitive level. Bányai and her colleagues proved this in a series of investigations carried out with the Parallel Experiential Analysis Technique (PEAT) ([Varga et al., 1994](#)), applied to dyadic hypnosis situations. The content analysis of the PEAT interviews was supplemented with self-report measures that were completed by both the subject and the hypnotist right after hypnosis. These measures included the AIM ([Nash & Spinler, 1989](#)) and the PCI ([Pekala, 1991](#)). In some of the experiments, neurophysiological indices of the participants were also studied ([Bányai, Mészáros, & Csókay, 1985](#)), including electroencephalography, electrocardiography, breathing, and galvanic skin response.

The most important finding of this multimodal interactional analysis technique was that in many hypnoses, the hypnotist and the subject tended to "synchronize" with each other in behavioral, neurophysiological, and even in phenomenological ways. This finding was not based on the reports of the participants only, but also on statistical analyses performed on their neurophysiological indices and on ratings of naïve judges who did not know either the subject or the hypnotist and were blind to the aims of the experiments ([Bányai, 1998](#)). The most striking evidence for interactional synchrony was found in the joint analysis of the PEAT interviews of the subject and the hypnotist: Sometimes they reported very similar experiences reflecting on the same time interval of the hypnosis session ([Varga, 2013](#)). Some of the reports and the responses on questionnaires given by the hypnotists showed that not only the subjects but the hypnotists may also experience ASC under hypnosis.

Hypnosis can be understood (and actually, is used in hypnotherapy) as a model situation of early relationships. Those patients who had secure attachment experiences can use this situation to find the needed resources to cope with their problems. Those who suffer from the consequences of insecure early attachment may have corrective experiences under hypnosis, if they get marked and contingent feedback from the hypnotist. This may also explain the positive relationship between parental punishment and positive archaic involvement towards the hypnotist ([Költő, 2008](#)), and between insecure adult attachment and hypnotic susceptibility ([Peter et al., 2011](#)). Observations in therapy settings suggest that hypnosis bears the features of transitional spaces and pretend plays. It is a context for practicing, correcting, and developing imperfect or damaged mentalizing abilities:

Mentalizing develops in attachment relationships and continues to be intimately tied to relationships. Even when individuals are mentalizing their own internal states, the extent to which they can find secure internalized attachment representations, or allow themselves to be assisted by external secure attachment figures (such as a therapist), ultimately determines their capacity to explore their inner world and that of others ([Luyten et al., 2012, p. 52](#)).

If we accept that hypnotic interaction is a model situation for early attachment relationships (and affectional bond), it seems feasible to conclude that from the subject's responses to the hypnotist we can make inferences about his or her mentalization skills. It also seems reasonable that the more someone can understand mental states the more likely she or he will be able to follow the hypnotist's suggestions and become involved in the hypnotic situation.

Still, if hypnosis "recalls" or reconstructs early attachment and affectional experiences (and the related patterns of mentalizing processes), it is not necessarily true that better attachment or affectional bond leads to higher hypnotizability. A highly organized S with secure attachment may be absorbed in hypnosis and because of her or his transference readiness ([J. R. Hilgard, 1970](#)) she

or he will demonstrate high hypnotizability. The insecurely attached S may be confused and dissociated; therefore she or he may use the strategy to follow the hypnotist's suggestions. This again results in high hypnotic responsiveness. Certainly, it can also happen that such subjects respond to the hypnotic situation with inhibition, leading to low behavioral hypnotic susceptibility scores; and in turn, a subject with secure attachment experiences, if she or he carries a COMT gene variant leading to overregulated dopaminergic activity, may be highly absorbed, but not performing the suggestions—again leading to low hypnotizability scores. A securely attached S may also have more self-confidence and not being influenced by the demand characteristics of the hypnotic situation. Maybe not just primary attachment but its later form, affectional bonding also has such an influence on hypnotic responses.

The solution can be if we treat both mentalization and hypnotic susceptibility as sets or bunches of different sub-skills or dimensions. [Shor \(1962\)](#) offered such a multi-dimensional concept for hypnotic responding, which adds transference emotions and phenomenological experiences of ASC to the traditional behavioral assessment of hypnotic susceptibility. Maybe mentalizing skills are related to these two dimensions as well; given that the securely attached people tend to be more affiliative and tend to enjoy interpersonal situations, the emotional aspect of hypnotic responding may be related to mentalization to an even higher degree than behavioral scores. If we take it into consideration that mentalization also refers to the processing of someone's own mental states, we can expect that good mentalizers may also experience stronger alterations in their consciousness (with more positive emotional valence) than those who have a reduced ability to mentalize their inner world. The latter, as we have seen, may be more prone to feel overwhelmed and confused under hypnosis, and the hypnotic situation may be more daunting for them. Some experiential methods are sensitive to such phenomena. This complexity of hypnotic responding and mentalization is the reason why I am suggesting a multi-dimensional approach in their investigation and using the more general terms "hypnotizability" and "hypnotic response" in addition to "hypnotic susceptibility."

The above listed theoretical models and empirical findings led me to attempt to integrate parental rearing style, mentalization, and hypnotic response into one concept. As I formulated it in the introduction (p. 23.):

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.

If this is an ecologically valid position, it can be proven by an empirical investigation whether the subjects' memories about their parents' behavior towards them in their childhood, their adult mentalization skills, and their hypnotic responses are interrelated. I hypothesize that elements or specific constellations of parental rearing style have both direct and mediated effects on adult hypnotic susceptibility. Given that mentalization abilities develop in the context of early attachment and later in socialization, and given that hypnotic response needs the ability to mentalize the hypnotist's mental contents (like her/his expectations, suggestions, attitudes), the parental rearing–hypnotizability link is partly moderated by mentalization skills. This basic concept is depicted in **Figure 1**.

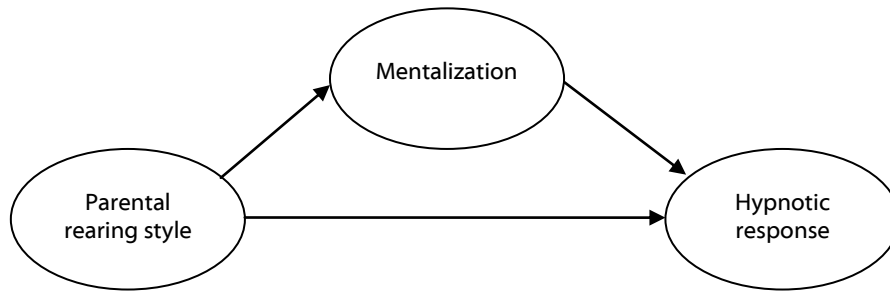


Figure 1 | The basic model of the “mentalization” interpretation of hypnotic response

In the previous chapters, many pieces of evidence were presented, suggesting that all of the three constructs are very complex. It is possible that some elements of them facilitate others, while inhibitory effects may also operate here. For instance, cold-restrictive parental behavior can lead to high dissociative proneness (manifesting in high hypnotizability in adulthood), but it might also be associated with maintaining constant monitoring of the environment and high control over one’s own behavior, which may prevent the subject from being engaged in hypnosis. There may also be a difference between the direct and the mentalization-mediated parental rearing–hypnotizability links. While cold-controlling parental behavior may be associated with a disturbance in mentalization (thus, the mediating link lowers hypnotic susceptibility), the same parenting style may lead to increased dissociative capacity and imaginative involvement, therefore acting as a facilitator of hypnotizability. The main goal of my dissertation is to examine this hypothetic concept regarding facets, dimensions and patterns of parental behavior, mentalizing, and hypnotic responding.

3.5. Summary

In the above chapter, pieces of evidence were presented which support the notion that parental rearing style may determine adult hypnotic responses directly and via the mediation of mentalizing skills. The next chapter will describe the aims and the scope of the present thesis, with the research questions and hypotheses on the relationship among parental rearing style, mentalization, and hypnotic susceptibility.

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4. AIM AND SCOPE OF THE PRESENT THESIS

SINCE BOTH HYPNOTIC susceptibility and mentalization are multi-dimensional features, the assessment of their relationship needs special consideration. I argue that the two abilities are both associated with affectional bonding and socialization, and therefore they are also closely related. Parental rearing style has a direct influence on hypnotic responding, and another part of the effect is mediated by the mentalization skills. To verify and unfold their relationship, a multivariate and multimethod statistical analysis is needed. In determining which tools would be useful and appropriate for this investigation, I was inspired by contemporary research projects on hypnosis and health psychology. In these projects, three techniques were identified that seemed to be especially useful in understanding the multidimensional nature of the variables and the hypothesized causal relationships among them. These are, multiple and nonlinear regression analysis, clustering, and structural equation modeling (SEM). In the first part of the current chapter, these techniques will be presented. Then I will present the hypotheses and the research questions: most of them are dealing with the relationship between parental rearing style, mentalization skills and hypnotic responses.

4.1. Multiple and nonlinear regression in hypnosis research

Hypnotic susceptibility has many determinants. They seem to influence the extent of hypnotic response in interaction. For instance, women are more hypnotizable than men, but a statistically significant difference can be found only if the Ss are assessed in a group setting. In other words, not just the subject's gender or the testing context influence hypnotizability, but their interaction is also a contributor ([Költő, Gösi-Greguss, et al., 2014](#)).

A conclusion we can make from the studies of hypnotizability is that certain personality styles, cognitive characteristics like the ability to maintain focused attention, and psychogenetic variability seem to be important factors determining hypnotic susceptibility. One of the few studies that offered an integrative analysis of these features is that of [Lichtenberg et al. \(2004\)](#). Summarizing the cognitive and psychogenetic investigations on hypnotic susceptibility until then, they built a multivariate empirical hypnosis model in which variability of the COMT gene and different attentional abilities—amplified focused and reallocated attention—take place. They further hypothesized that absorption, persistence, and novelty seeking may also contribute to hypnotizability. Hierarchical multiple regression models were built to check if these features share in the variance of hypnotic susceptibility. The final model, including persistence, COMT, absorption, moderately focused and dual attentional abilities, and impulsivity, explained 33.6% of hypnotizability's variation. The same model had an explanative power of 43.8% for females and 29% of males. An important feature of the study was that, contrary to the majority of experimental investigations which usually recruit young adults (mainly undergraduate psychology students), Lichtenberg and his colleagues examined people with an age varying from 18 to 71 years. Novelty seeking, although it significantly correlated with male Ss' hypnotizability, was not a remarkable predictor in the multiple regression analysis; on the other hand, persistence was found to be a contributor. Maybe it is not the "novel" experience that highly hypnotizable people search, but they find reward in situations which need long-lasting, effortful, and directed attention. Motivation and persistence, just like the mechanisms of mentalization and hypnotic state, are associated with the medial PFC and the ACC. Maybe HHs are intrinsically motivated and aroused by hypnosis. Although Lichtenberg and his colleagues don't consider this aspect, the root of this intrinsic motivation may be that HHs are more rewarded by *social affiliation* than LHs. This term denotes a preference for establishing and maintaining interpersonal relationships ([Freeman, 1992](#)), which necessarily includes the ability—and the desire—for understanding other people's mind. The multiple hierarchic model Lichtenberg and his colleagues suggested also seems to be a good tool for analyzing how and to what extent are developmental factors and facets of mentalization associated with hypnotic susceptibility. Among women, interpersonal orientation was found to be associated with hypnotizability ([Bentler, 1963](#)).

In searching for the hypothesized links between alexithymia and hypnotizability ([Költő & Bányai, 2015](#)), we suggested that the association between the two constructs is not necessarily linear. Alexithymia is associated with dissociative capacity, which suggests that higher alexithymia scores predict higher hypnotizability. On the other hand, the higher someone scores on alexithymia, the higher anxiety may s/he experience in social situations, which may prevent her/him from experiencing relaxation and being absorbed in hypnotic trance. From findings in the literature and our own clinical observations, we hypothesized that in certain circumstances both lexithymic and alexithymic subjects or patients can experience hypnosis. While lexithymics may be able to relax and use their imaginative involvement to get into trance, alexithymics may use the suggestions and the “structure” of the hypnotic situations provided by the hypnotist. This suggests that instead of a linear association, hypnotizability and alexithymia show a nonlinear (U-shaped) relationship, with lexithymics and high alexithymia scorers demonstrating higher hypnotic capacity than those who are in the sub-clinical range of alexithymia. To test such an association, both linear and nonlinear regression analyses shall be conducted, with hypnotizability being the independent variable and alexithymia is the regressor. If nonlinear (quadratic) regression equities explain more of hypnotizability’s variation than linear equities, the hypothesized U-shaped relationship will be verified.

Besides attention, personality, and genetics, elements of parental rearing style and mentalization skills may also contribute to the variation of hypnotic susceptibility. Therefore, Lichtenberg et al.’s method seems to be feasible for the investigation of the parental rearing style–mentalization–hypnotizability link we hypothesize. It also has to be checked whether the associations are linear or nonlinear.

4.2. Clustering

Although it is not a frequently used technique in hypnosis research, it also seems to be an interesting question whether people can be classified on the basis of their hypnotic responding, i.e., if there are any types or patterns within hypnotic susceptibility. [Józsa \(2012\)](#) addressed the variety of dyadic experiences of subjects and hypnotists under hypnosis. In her doctoral thesis she applied cluster analysis to check if dyads can be categorized upon the perceived harmony between the S’s and the H’s experiences. She used K-means method, based on the differences in the Dyadic Interactional Harmony (DIH) questionnaire scores of the Ss and the Hs. The analysis revealed that the dyads can be categorized into four meaningful groups. The clusters were labeled as follows: (1) “Mildly involved S with tense and emotional H”. (2) “The S’s deep trance and intensive emotions are guarded by the rational [less involved] hypnotist”. (3) “Intensively involved S, feeling positively about the H; the H shows the least involvement [of the 4 clusters]”. (4) “H experiencing deep trance and is intensively involved, the S shows no emotional involvement”. These specific patterns weren’t discriminating between the Ss’ hypnotic susceptibility (as measured by SHSS:A and SHSS:C), but in Cluster 4, Hs were more hypnotizable and also felt more positive counter-transference towards the S than in Cluster 2. When the phenomenology of ASC was examined across the clusters, it was found that the Ss did not differ in the level of dissociated control and visual imagery, but in some clusters their positive or negative emotions showed specific patterns. In Cluster 2, their attention to inner processes was significantly higher, while in Cluster 1, it was significantly lower than the average. Apparently, these categories do not differentiate along the extent of dissociation the Ss experience, but it makes a difference in their emotional states and the extent of attention to their inner mental world. Subjects’ hypnotizability scores did not differ across clusters, which is in line with the notion that subjective experiences, emotions, and observable behavior are not necessarily inter-related in hypnosis, and from the behavioral hypnotizability scores we cannot make inferences about hypnotic transference (countertransference) and emotional processing ([Varga, 1991, 2004](#)). These findings, especially those on the differences in attention towards the subject’s inner world, also shed light on mentalization. Cluster analysis seems to be an especially valuable tool for classifying parents according to their behavior towards the child. Such an analysis ([Pereira et al., 2009](#)) verified that there are distinct patterns of parental rearing style across demandingness and responsiveness. Maybe such clusters can better be used in the understanding of the developmental roots of mentalization and hypnotizability than the association with certain forms of parental behavior.

4.3. Structural Equation Modeling and Mediation Analysis

Structural Equation Modeling (SEM) is a confirmative statistical method of analysis of a system that represents causal relationship(s) among multiple variables (Byrne, 2010). It is based on goodness-of-fit between a hypothesized causal system and the actual data. At the present, it is a relatively rarely used technique in hypnosis research. A notable exception is the study of Benham et al. (2006), who investigated how expectancies influenced the performance on consecutive fractions of SHSS:C suggestions. Their analysis suggested that expectancies on their own did not give a sufficient explanation for SHSS:C scores; when a latent variable of “hypnotizability trait” was added to the model, it showed adequate fit. This finding strongly supports that social factors on their own are not enough to explain individual differences in hypnotic responses, but there is a general disposition for hypnotic responding. This kind of investigation, uncovering causal relationships between the variables, is called path analysis.

Another application of SEM is to examine whether a previously set (theoretical or empirical) item structure of a measure can be confirmed by the current data. This process is the so called confirmatory factor analysis (CFA). Like path analysis, CFA is also based on computing goodness-of-fit indices, namely, checking if the data support the previously set model structure. If a previously existing measure is tested—thus we have an expectation how its items are organized—CFA is more appropriate than explorative factor analysis (Byrne, 2010). This confirmatory technique was used in establishing the factor structure of the Sense of Agency Rating Scale (SOARS) (Polito et al., 2013), the Valencia Scale on Attitudes and Beliefs toward Hypnosis (Capafons, Cabanas, Espejo, & Cardeña, 2004), or to select the best fitting model from competing solutions of the Dissociative Experiences Scale (Stockdale, Gridley, Balogh, & Holtgraves, 2002). CFA seems to be an adequate technique to check the structural validity of the measures applied in the current doctoral thesis.

As outlined in the previous chapter, I hypothesize that there is a direct link between parental rearing style and facets of hypnotic response; but mentalization skills (also rooted in attachment to the parents) may also have a mediating effect on this causal link. This assumption can be tested with another SEM technique: mediation analysis (Baron & Kenny, 1986). Mediation means that the independent variable (in the present case, parental rearing style) does not just have a direct effect on the dependent variable (hypnotic response), but the effect emerges partially through a third variable, the so-called *mediator* (mentalization skills). Semmens-Wheeler et al. (2013) investigated whether the effect of alcohol on hypnotic susceptibility is mediated by the Ss’ expectations (i.e., that their drunkenness would increase their hypnotic responses). They found that conscious expectations had partially mediated the relationship (i.e., the Ss’ hypnotic performance was increased by their belief that alcohol will increase it), but inclusion of expectations did not eliminate alcohol’s direct effect on hypnotizability, meaning that alcohol influences hypnotizability even without changing expectations. The authors found that the direct effect may be attributed to alcohol-induced impairment of executive functions in the frontal lobe. If memories of upbringing—which reflect early attachment patterns—influence hypnotic responding with the mediation of mentalization skills, such an analysis can bring significant results.

4.4. Paper-and-pencil or Internet-based assessment?

An increasing number of survey studies are conducted partly or solely via the Internet, and psychological investigations are no exceptions. There is a large variety of free or pay-online surveying tools. Web-based psychological research has many advantages and disadvantages as compared to traditional “offline” paper-and-pencil questionnaires and laboratory experiments. The advantages include easy access to a relatively large number of diverse participants as well as rare and specific populations; better generalizability of the findings to the general population⁴; cost- time- and organizational efficacy, reduction of experimenter effects and demand characteristics. Among disadvantages, we can find dropout, the lack of personal contact with the participants, the relatively

⁴ Although Internet users are younger than the general population, online surveys can reach many people who otherwise would not have been accessible to researchers. That’s the reason for the authors to consider the results of online research more generalizable than those of paper-pencil or laboratory studies.

small amount of evidence aggregated for now, and limited external validity (as participation is constrained to those who use computers and Web) ([Reips, 2002](#)). There are preconceptions about Web-based research, too; for example: the respondents are not as serious as those who meet the experimenters face-to-face; Internet samples are not demographically diverse; the findings are compromised by anonymity; the results differ from those obtained with other methods. Carefully conducted meta-analyses prove that most of these preconceptions are myths, although they acknowledge that more data should be collected to prove the convergent validity across online and offline examinations ([Gosling, Vazire, Srivastava, & John, 2004](#)). Although hypnosis can be carried out via online media like Skype, it seems apparent that the hypnotist cannot attend any unexpected reactions and cannot monitor the physiological changes in the subject. It seemed feasible, however, to make a design for the present study in which measures of parental rearing and mentalization are administered through an online surface, before the Ss come to the laboratory for the hypnosis session. This design has the advantage that it can be accommodated easily to the “high hurdle” criteria, which facilitates the Ss to be involved in the study and not jeopardize the research ([Reips, 2002](#)). High hurdle techniques include, for example, emphasizing that the research is serious, or making the administration comfortable to the subjects (e.g., telling them in advance approximately how much time is needed for completing the tests; partitioning the measures to smaller chunks on one screen, etc.). To the best of my knowledge, only the TAS-20 has been examined for comparability of its paper-and-pencil and Internet-based administration ([Bagby, Ayeart, Morariu, Watters, & Taylor, 2014](#)) among the measures applied in my study. If a safe website is used, and ethical data collection is guaranteed, the online administration of such measures as TAS-20 (and EMBU, ECS and RMET) will most probably lead to reliable and valid results. Indeed, ecological validity is enhanced by the fact that the Ss respond the test in familiar surroundings like their home or workplace; therefore the context and experimenter effects are eliminated. Certainly, the data collected via the Internet should be carefully compared to earlier paper-and-pencil questionnaires and tests administered in laboratory environments.

4.5. *Experimenter Effects*

We know a lot about the subjects participating in hypnosis research projects; observations on the hypnotists are remarkably rare. [Kihlstrom \(2008, p. 23\)](#) attributes this scarcity to methodological difficulties: “Simply to investigate the effect of the hypnotist’s gender on hypnotizability would require that a fairly large, representative sample of men and women be trained as hypnotists and then turned loose on an even larger group of subjects (...) It’s all a very daunting task.” Maybe the small number of hypnotists was the reason why no differences were found in the Ss’ hypnotizability initially as a function of the gender of the hypnotists ([Coe, 1976](#); [D’Eon, Pawlak, Mah, & Spanos, 1979](#)). A later study, however, found that the experience of the hypnotist made a difference in the Ss’ hypnotic response (for Caucasian hypnotists, but not for Afro-Americans) ([Balaschak, Blocker, Rossiter, & Perin, 1972](#)). The perceived authority of the H may influence the subjects’ emotional involvement in the hypnosis, even in standard laboratory hypnosis sessions ([Bányai, Varga, & Gósi-Greguss, 2001](#)). In an earlier phase of the present study it was demonstrated that female Hs evoked more positive and less negative emotions in their subjects (although the behavioral hypnotizability scores did not differ); still, there was a small but significant gender interaction (gender of the S \times gender of the H) in HGSHS:A observer-scores ([Költő, 2012](#)). Hypnotists seem to be more hypnotizable than the general population ([Gósi-Greguss, Bányai, & Varga, 1996](#)), although their hypnotizability is not related to the perceived harmony of their interaction as either they or their Ss experience it in hypnosis ([Varga, Józsa, Bányai, & Gósi-Greguss, 2012](#)).

Most studies in hypnosis research in many cases (when the experimenter is mentioned at all) are employing only one hypnotist, although it seems to be important to check whether the personal variables of the hypnotist have an effect on the Ss’ hypnotic response. ([Kihlstrom, 2008](#)) suggests that a “fairly large, representative sample” of hypnotists should be recruited for experiments. That is the reason why more hypnotists took part in the present investigation. Based on previous findings, I hypothesize that these will affect the emotional valence of the relationship with the hypnotist, but will barely influence the behavioral and phenomenological responses to hypnosis, if at all.

4.6. Research Questions and Hypotheses

Based on theoretical considerations and previous empirical findings, the present thesis seeks for a better understanding between parental rearing style, mentalization skills and hypnotic responsiveness. The following research aims, questions and hypotheses were formulated:

- Question 1** Are memories of parental rearing associated with mentalization sub-skills (including reading the mind in the eyes, emotional contagion, and alexithymia)?
- 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 will be their emotional bond towards the hypnotist.
- 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. alexithymia, which is reflected in negative regression coefficients in the parental rearing → alexithymia and alexithymia → 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.

5. SAMPLE AND METHODS

THERE ARE MANY METHODS of assessing parental behavior, mentalization, and hypnotic susceptibility. In developing a battery to test them and their relationship, many points had to be considered. I aimed to select modern, standardized quantitative methods that are grounded in the given field, have evidence for validity and reliability, and if possible, have Hungarian norms, therefore, they can be subjected to multimethod and multivariate statistical analysis. To provide sufficient statistical power for these analyses, an adequately sized sample had to be tested. The *a priori* power analysis, based on previous results in the literature and conventional specifications of statistical methods, suggested testing at least 250 subjects. These requirements stipulated using a test battery including brief measures, filled in by the subjects via an online survey system, and the administration of a group method to assess hypnotic susceptibility. In recruitment, my aim was to involve as many healthy adults who are neither psychology students nor psychologists as possible. In the current chapter, first the sampling, the recruitment process, and the characteristics of the actual sample will be presented (Section 5.1).

In the subsequent sections, methods and procedure will be outlined. The basis of the selection was the list of measures I presented in Section 2.4 on the assessment of mentalization. The battery had to fulfill the above requirements, and some more. Given the previously known links between affective processing and hypnotizability, the battery had to include measures of emotional contagion and alexithymia; given that mentalization is a non-verbal process to a great extent, such a measure for emotion recognition shall be included. Thus, the ECS ([Doherty, 1997](#)), the TAS-20 ([Bagby et al., 1994](#)), and the RMET ([Baron-Cohen et al., 2001](#)) were administered to the subjects online. The latter two tests also have Hungarian norms; the ECS was adopted for the present research. Our hitherto unpublished previous findings indicated that online testing is a reliable alternative for the paper-and-pencil questionnaires; nevertheless, data obtained with online testing will be carefully checked against normative data that came from traditional administration.

The Hypnosis Laboratory of Eötvös Loránd University has been using the standardized Stanford Hypnotic Susceptibility Scales (presented in Section 1.5, on measuring hypnotizability) routinely since the 1970s. Thus, it was obvious that such a standardized test situation would be the most feasible method for testing the behavioral dimension of hypnotizability. Two opposing criteria were considered (in addition to the ones described above). First, it seems obvious that an individual hypnotizability assessment gives a better possibility for mutual attunement of the H and the S than a group method; therefore it may be a better setting for searching the links between mentalization and hypnotizability, and the hypnotists could also be tested for their involvement and affect under hypnosis. With the sample size required by the *a priori* analysis of statistical power ($N > 250$), however, it seemed impossible to apply individual testing. Given that the current investigation covers only the subjects and that group methods seem to be reliable substitutes of individual assessment ([Bentler & Hilgard, 1963](#); [Bowers, 1993](#)), a group method promised to be a reasonable procedure for the present investigation. Another issue was the emphasis of the scales. As discussed earlier, the HGSHS:A ([Shor & Orne, 1962](#)) consists primarily of motor suggestions, whereas the WSGC ([Bowers, 1993, 1998](#)) includes a greater number of perceptual-cognitive suggestions. The results reviewed in Chapter 3 on the relationship between hypnosis and alexithymia are obtained with either HGSHS:A or WSGC. It seems that “hot”, simulation-based, automatic ways of mentalization—emerging from the observation of others’ movements and body talk, like emotional contagion—may be related to the motor aspect of hypnotizability ([Cardeña et al., 2009](#)), while the “cold”, cognition-based, theory-driven mentalizing skills, for instance, “alexithymia” may show stronger association with the perceptual-cognitive component of hypnotic responding ([Költő & Bányai, 2014](#)). Therefore, the application of HGSHS:A and WSGC both seems to be fruitful. However, [Cardeña and Terhune \(2009\)](#) note that WSGC poses higher risk of causing negative aftereffects than HGSHS:A. These risks can be attributed, in most of the cases, to unpleasant memories emerging from the age regression suggestion. Although both methods are routinely used in our lab,

the HGSHS:A is a far more often applied and investigated method (Költő, Gósi-Greguss, et al., 2014), and, as opposed to WSGC, it has normative data in Hungarian (Költő et al., 2015). These conditions made it clear that in the present investigations, the HGSHS:A should be used to test the behavioral dimension of hypnotic responding.

To study the emotional and phenomenological dimensions of hypnotic susceptibility, again, a wide variety of methods are available. The ones with the largest research corpus are the AIM (Nash & Spinler, 1989) and the PCI (Pekala, 1991). They are convenient paper-and-pencil tests to be filled in by the subjects after hypnosis. They are valid and reliable methods to map the Ss' emotions towards the hypnotist and the phenomenological changes the Ss experienced as compared to their everyday waking state (Bányai et al., 2001; Varga, 1991, 2004, 2013; Józsa, 2012).

In the previous chapter on the aims and scope of the thesis, I shortly described three statistical approaches to a multidimensional investigation of parental rearing style–mentalization–hypnotic responding. In the current chapter, sampling process, design and procedure, and considerations on specific methods of statistical analysis will be presented.

5.1. Sampling Process, Recruitment and the Actual Sample

In selecting the sample, many points had to be considered. First of all, an appropriate number of subjects had to be involved for sufficient statistical power. Second, the “psychology student effect” had to be controlled, even if undergraduate psychology students serve as subjects for many psychological studies in the world, and hypnosis research projects are no exceptions. The reason is that psychology students' and professionals' hypnotizability seems to be higher than that of non-psychologists (Költő et al., 2015), which fact may damage the ecological validity of the findings. Therefore, our aim was to recruit at least half of the sample from a non-psychologist population. Differences between psychology and non-psychology subjects, however, are scarcely investigated; I aimed therefore to create a sample in which characteristics of these two groups can be compared. I conducted an *a priori* analysis of statistical power to determine the ideal sample size.⁵ The results indicated that around 200 subjects is needed who has responses on all measures to obtain an acceptable (.80) level of statistical power in the *post hoc* analyses.

5.1.1. Recruitment

Subjects were recruited in various ways. Psychology students were invited in the frame of courses on hypnosis and psychology of consciousness to take part in the department's research projects on hypnotic susceptibility, affect regulation, psychogenetics, cognitive abilities, hypnosis, etc. The students were asked to forward the call for participation to their acquaintances who might be interested in participation. Criteria for inclusion were age over 18 years and being somatically and mentally healthy. To increase the number of non-psychologist participants, one task of the students involved in methodological courses of hypnosis research was to reach and invite Ss into the investigation. Subjects were also asked to tell about the experiment to their acquaintances (without actually telling them what suggestions would be given to them in the group hypnosis sessions). In other words, chain-referral (snowball) sampling was used, based on availability, until a needed sample size was achieved. When the first hypnosis sessions were conducted, we had not have obtained permissions for using the other measures; therefore not all Ss have data for all measures. In a later phase of the research project, more non-psychologists were recruited, to create a more balanced pool of Ss across professions. Participation was free—facultative even for the psychology students who attended hypnosis courses—and not remunerated, either with money or academic credits.

⁵ You can find a detailed description of the analysis in Appendix A.

5.1.2. Actual Sample

In total, 565 subjects participated in the HGSHS:A group hypnosis sessions, followed by administration of AIM and Phenomenology of Consciousness (PCI) questionnaires. Two hundred and thirty-five of them (41.6%) were males and 330 (58.4%) were females. The youngest S was 18, while the oldest one was 68 years old, with a mean age of 26.11 years (SD = 8.41). The participants' age-distribution is depicted in **Table 2**, in a similar breakdown as used by [Page and Green \(2007\)](#). While the majority of the sample belongs to the student or young adult age group, there are a considerable number of older adults as well. The sample comprised mainly students of several disciplines and young adults from different fields of work. A relatively large part (n = 121, 26.4%) consisted of undergraduate psychology students and a small number of doctoral students and psychologists who took part in hypnosis courses. The majority, however, did not have a professional background in psychology⁶. In sum, 459 Ss provided information about their profession. The distribution of the Ss across their profession is depicted in **Table 3**. As you can see, many different areas are represented in the sample.

Table 2 | Age distribution of the sample

Age group	Freq.	%
18–20	112	19.8
21–24	224	39.6
25–28	104	18.4
29–32	41	7.3
33–36	26	4.6
37–40	17	3.0
(41–50)	20	3.5
(51–68)	21	3.7
Total	565	100.0

Table 3 | Profession of the subjects

Profession	Freq.	%
Psychology/Healthcare	141	30.7
IT/Engineering	80	17.4
Economy/Commerce	68	14.8
Legal/Administrative	43	9.4
Culture/Science	76	16.6
Other	51	11.1
Total	459	100.0

However, not all of these subjects were assessed regarding their memories of their parents and their mentalization skills. These assessments preceded participation in the group hypnosis sessions. As I mentioned before, the sample was imbalanced across professions (psychology students predominated), therefore not all of them were investigated for their parental memories and mentalizing capacity. In **Table 4** you can see the number of subjects and percentage of psychologists who filled in the EMBU, the RMET, the ECS and the TAS-20 questionnaires.

Given that non-psychologists represented a somewhat older age population, there are some age differences between the entire sample the subsamples that filled in certain questionnaires. 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 fraction (in the following, it will be referred as *core sample*)—those who responded to all online measures and participated in hypnosis—included 191 subjects. **Table 4** shows age properties of the entire sample and the core sample. The members of the core sample were significantly older than those in the entire sample [$t(754) = -3.28, p < .001, r_{ES} = .12, \text{power} > .99$], although the effect is small. The large sample size is advantageous when the structural validity of HGSHS:A, AIM and PCI will be checked and when dimensions of hypnotic response will be compared, that is why I decided to use the data of the whole sample and not just that of those who responded to all measures.

⁶ For the sake of convenience, in the further part of the thesis, psychology undergraduates, undergraduate and doctoral students in psychology, and graduated psychologists with a diploma will all be referred to as “psychologists”, while professionals and students of other disciplines as “non-psychologists”.

Table 4 | Proportion and mean age of the subjects assessed for hypnotic response but not necessarily taking part in the online testing (entire sample), and those who were measured for all variables, including parental memories and mentalizing skills (core sample)

	Proportion / Age			
	<i>N</i>	<i>M(Age)</i>	<i>SD(Age)</i>	Psych. ^a
Entire sample	565	26.11	8.41	26.40
Core sample	191	28.53	9.89	9.60

Note. ^aProportion of psychologists in the sub-sample (percentage), among those who provided information about their profession ($n = 459$).

The table shows that the entire sample is younger and it consists of more psychology students or psychologists than the “core sample” (which consists of Ss who have responses on all measures).

5.2. Procedure and Ethical Considerations

5.2.1. Design and Procedure

It is a methodological error in hypnosis research projects is if we measure the psychological constructs hypothesized to be associated to hypnotic responding *after* the assessment of hypnotic susceptibility. The subjects tend to make a “connection” between hypnosis and the other tests, and they fill in the latter with this regard, which inevitably results in distortions. [Council \(1993\)](#) noticed that hypnotizability showed significantly higher correlation coefficients with personality traits if the personality tests were administered after hypnosis (as compared to prior administration). He coined this distortion “context effect” and warned researchers that prior administration may lead to more valid results. Keeping this in mind, I set up a combined survey–observational design study.

In the first part of the investigation, the Ss filled in a questionnaire package, consisting of a brief demographic part, the EMBU, the RMET, the ECS and the TAS-20, in an online survey system⁷. Those Ss who indicated their intention to participate in the research project received the link to the test battery in an e-mail, with an identification code assigned in the order of application. Hypnotizability testing took place approximately 2-3 weeks after administration of the online questionnaires. The HGSHS:A was administered to the subjects, according to standard instructions⁸. In order to eliminate experimenter effect (i.e. that Ss respond similarly to the same hypnotic operator), six hypnotists (3 females and 3 males), with 4–45 years of expertise in clinical and/or research hypnosis, administered the scale live. Following the HGSHS:A, the Ss filled in the AIM about their emotions to the hypnotist, and the PCI to investigate their hypnotic experiences. After completing these measures, the Ss were invited to share their experiences with the group (asking everybody to keep these accounts confidential). The hypnotist and the experimenter answered all questions. The Ss did not receive money or any other form of remuneration for their participation.

5.2.2. Ethical Considerations

Before the experiments, all Ss were assigned an identification code. In the online survey system they just had to give this code, their gender, and their date of birth for identification. The Ss indicated their agreement in taking part in the research by filling in the online questionnaires. Before the group hypnosis took place, the author (serving as either the head of hypnosis observers or as a hypnotist) briefly explained the aim of the research project, namely, that the relationship between affective processing skills and hypnotic susceptibility was studied. Subsequently, either he or another experimenter serving as hypnotist outlined the procedure of group hypnosis, and they answered the Ss’ questions. Before hypnosis, but after the initial conversation, the Ss signed an in-

⁷ The platform for administering the tests of parental rearing style and mentalization skills was <http://www.kerdoivem.hu>, the Hungarian version of <http://www.mysurvs.com> (translated to Hungarian by the author). I am grateful to Mărcis Balodis, owner of FunGeneration Lab, for kindly permitting me to use the system for the research for free.

⁸ For a detailed description of HGSHS:A administration, see [Költő et al. \(2015\)](#).

formed consent form⁹. In all group hypnosis sessions, a second licensed hypnosis expert was present in order to attend the rarely occurring but possible side effects of hypnosis (e.g., dizziness or headache). Following dehypnosis and filling in the questionnaires, the Ss were invited to share their experiences and raise any questions regarding hypnosis or the whole research project. The investigation was carried out in accordance with the Professional Ethical Code of the Hungarian Psychological Association and the Helsinki Declaration ([WHO, 2001](#)).¹⁰

5.3. Testing Parental Rearing Style, Family Composition and Love for Parents

To investigate the memories related to parental behavior, generally interview methods (the Adult Attachment Interview) and many quantitative measures are used ([Mikulincer & Shaver, 2007](#)). From these, two methods are regularly utilized in the relevant literature. These are the Parental Bonding Instrument (PBI) ([Parker et al., 1979](#)) and the EMBU. The two methods are quite similar in their length (PBI: 25 items, EMBU: 23 items), and both are adapted to Hungarian. EMBU seemed a better choice than PBI for two reasons: 1) EMBU is regularly used in our laboratory ([Költő, 2008](#); [Heller, 2011](#); [Varga & Kekecs, 2014](#)); 2) it contains more items referring to the parents' punitive behavior than PBI does. Therefore I decided to use it in the current investigations as well. The EMBU reflects on parental emotional warmth, and—although it is not a genuine factor in the measure—parental punishment can be also derived from it. As mentioned earlier, we observed in our previous investigations that a remarkable proportion of the subjects wrote side-notes on the questionnaire, indicating that they were not raised up in traditional families with the two biological parents. It occurred to us that parental behavior does not necessarily correspond with the *child's* affection towards the parents. Therefore we supplemented the EMBU with some questions on the family composition and the child's past and actual love for the parents. These items, as you will see, can also serve as validation tools again the cluster structure identified in parental rearing style.

The EMBU was originally developed by [Perris, Jacobsson, Linndström, von Knorring, and Perris \(1980\)](#). This version comprised 81 items, organized into 15 subscales and 3 main factors. A shortened version, including a Hungarian (and Greek, Guatemalan and Italian) standard,¹¹ was created by [Arrindell et al. \(1999\)](#), consisting of 23 items, organized into the same factors as the original: *Rejection* (e.g., “My parents criticized me and told me how lazy and useless I was in front of others”), *Emotional Warmth* (e.g., “My parents showed with words and gestures that they liked me”), and *(Over)protection* (e.g., “When I came home I had to account for what I had been doing to my parents”). Subjects evaluate how much they agree with the items separately for their mothers and fathers on a 4 point Likert scale (1 = No, never; 2 = Yes, but seldom; 3 = Yes, often; 4 = Yes, most of the time). The EMBU showed good convergent validity to a personality and a self-esteem questionnaire, gave consistent results across different cultures, and demonstrated adequate reliability (Cronbach alphas for the entire questionnaire varied between .72 and .82). The EMBU comprises a number of items that reflect on parental punishment (e.g., “It happened that my parents gave me more corporal punishment than I deserved”; “It happened that my parents forbade me to do things other children were allowed to do because they were afraid that something might happen to me”). This gave us a possibility to construct an operational *Punishment* factor, that subsequently turned out to show a significant association with hypnotic susceptibility ([Költő, 2008](#); [Heller, 2011](#)). In these studies, we also observed that simply asking the Ss to report about their father's and mother's behavior is not as simple as it would first be seen, for instance if two persons (a biological father and the mother's new boyfriend or life partner) had the same role in the Ss' upbringing. Be-

⁹ The consent form is presented in Appendix B.

¹⁰ We did not obtain an overall ethical permission from the University's Research Ethics Committee. At the time of the first group hypnosis sessions (early 2009), the ethical control over PhD research projects was exerted by the supervisors. The University's Research Ethics Committee started to review applications (in accordance with the Domestic Regulations of ELTE PPK, 26. §, Par. 10–11) from 12 November 2013. The Committee did not employ retrospective revision of research projects that had started earlier. It is important to note, however, that I strictly adhered to all ethical and subject safety guidelines our laboratory developed in the last four decades, including a precursory training of the observers, and the presence of a co-hypnotist.

¹¹ The entire scale is presented in Appendix C. I am grateful to Prof. Dr. János Kállai (University of Pécs, School of Medicine) for his permission to use the EMBU in our laboratory.

sides remarks on family structure, some Ss also wrote a side-note on the questionnaire (or told us personally) that her or his emotions toward the parents are independent from the parental behavior: For instance, it happened that a S got severe and undeserved corporal punishment from her mother, but the S attributed it to that the fact that the mother had also been frequently beaten in her childhood, and despite the beatings, the S loves her mother. Based on these issues, we supplemented the EMBU with some questions. Prior to the items on parental behavior, a question was asked about who raised the S (response options: “The same person(s) raised me in my childhood” / “The same person(s) raised me in the largest part of my childhood” / “It changed who raised me in my childhood”—in the latter cases, the S was also asked to specify who raised her or him). Another question asked who the primary caretaker(s) of the S were in the largest part of the S’s childhood. Response options were: Biological parents / Biological mother / Biological father / Step parents / Stepmother / Stepfather / A biological parent and her or his partner / Other person(s) (to be specified). After these questions, the original 23 items were administered. Then the Ss had to evaluate how much they liked their mother and father in their childhood and how much do they like them now, on a scale from 1 to 10. Given that some Ss may have been raised by a single parent, all questions but for the first two (on family structure) could be skipped. The EMBU contains a question regarding siblings (with instructing Ss who were only children to skip it), which allows the researchers to filter only children.

5.4. Testing Mentalizing Skills

5.4.1. Reading the Mind in the Eyes Test (RMET)

The RMET ([Baron-Cohen et al., 2001](#))¹² originally served as a screening method for adults with Asperger syndrome or other conditions of the Autistic spectrum. Nevertheless, even the authors emphasize that it taps into mentalizing ability and healthy subjects can be assessed for their emotion recognition as well. The RMET consists of 36 black and white photographs of the eye region of 18 males and 18 females, 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 distractor words have an emotional valence similar to the target word (i.e. *jealous-panicked-arrogant-hateful*, the target word underlined); for a sample image, see **Figure 2**.



Figure 2 | A practice item from the Reading the Mind in the Eyes Test ([Baron-Cohen et al., 2001](#)).
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¹² The entire RMET is not presented in this thesis. I am grateful to Dr. Eszter Rozália Ivády (Budapest University of Technology and Economics, Department of Cognitive Science), the translator of RMET, who gave permission to our laboratory to use the Hungarian version. The RMET is available at http://www.autismresearchcentre.com/arc_tests in Hungarian, English, and many other languages. It can be used in academic research projects for free after obtaining permission from Prof. Dr. Simon Baron-Cohen.

The authors outline the test's task in the following way: The subject shall have a lexicon of mental states and their associated descriptors. The test is based on a mapping process of recognizing and identifying mental states from the eye region of the faces. This mechanism needs unconscious, rapid, and automatic processing, when the subject matches the eye-region facial expressions to similar representations stored in memory and select a particular descriptor of a mental state which is the closest to the expression seen. They note, however, that this reflects only the first phase of mentalizing, the attribution of the facial expression to a given mental state. The second stage, making inference about the given mental state (e.g., "Maybe he is happy because he got good news"), is not a part of the test. However, the RMET seems to be a reliable and valid measure of this mentalizing sub-skill we hypothesized to be related to hypnotic susceptibility. The RMET was adapted to Hungarian by [Ivády, Takács, and Pléh \(2007\)](#). The adjectives in the Hungarian version of the test are not a mirror translation of the original English; if needed, Ivády and her colleagues applied some culturally equivalent substitutes catching the meaning of the original word but comprehensible for a Hungarian sample (e.g. insisting → *makacs* 'stubborn'). Both the Hungarian and the English versions were administered to 18 bilingual Ss. Their scores showed high correlation between the two versions ($.32 \leq r \leq .64, p < .05$ for all items).

5.4.2. Emotional Contagion Scale (ECS)

The ECS ([Doherty, 1997](#))¹³ is a questionnaire of 15 items that taps into how much the respondent automatically mimic and feel others' emotions. Extending the classification of [Baron-Cohen et al. \(2001\)](#), alongside with reading affect in the eyes, emotional contagion also belongs to the first, automatic and unconscious phase of mentalization. Even if the ECS is a verbally administered measure, it reflects the respondents' behavior rather than their cognition. Although the author suggested unidimensional scoring (a Cronbach alpha of .90 underpins the one-factor solution), more factorial solutions exist, for instance, items with positive and negative emotional valence can be separated (e.g., "When someone smiles warmly at me, I smile back and feel warm inside" *versus* "I cry at sad movies"). A later analysis, using confirmatory factor analytic techniques, revealed that neither unidimensional nor two-dimensional solutions show good fit; a hierarchical model with two first-order and five second-order factors was proposed. The Positive factor involves contagious feelings of love and happiness; the Negative factor consists of fear, anger, and sadness sub-dimensions ([Lundqvist, 2006](#)). The positive-negative distinction, however, was used to uncover the relationship between emotional contagion and hypnotizability ([Cardena et al., 2009](#)). Respondents have to mark how often they are infected by such emotions on a 4 point Likert scale from 0 (Never) to 4 (Always). Given that the scale had no Hungarian normative data, it was adapted to Hungarian for the present thesis. Two colleagues involved in teaching and research in affective psychology translated the scale; these translations were back-translated into English by two other colleagues who hadn't been familiar with the scale. The back-translations were checked against the original and conflicting solutions were discussed. Descriptive data and reliability indices were checked against the original (see Results).

5.4.3. Toronto Alexithymia Scale (TAS-20)

The most frequently used quantitative measure of alexithymia is the 20-item version of the Toronto Alexithymia Scale¹⁴ (TAS-20) ([Bagby et al., 1994](#)). It is a self-report questionnaire, with items organized in three factors. These are *Difficulty in Identifying Feelings* (e.g., "I am often confused about what emotion I am feeling"), *Difficulty in Describing Feelings* (e.g., "It is difficult for me to find the right words for my feelings"), and *Externally Oriented Thinking* (e.g., "I prefer talking to people about their daily activities rather than their feelings")¹⁵. The items are rated on a 5 point Likert scale (1 = Total disagreement, 5 = Total agreement with the given item), resulting in a

¹³ The entire scale is presented in Appendix D. I am grateful to Dr. Prof. Elaine Hatfield (University of Hawaii, Department of Psychology), one of the developers of the original scale, for permitting us to use the ECS.

¹⁴ The entire scale is presented in Appendix E. I am grateful to Dr. Renáta Cserjési (now at Eötvös Loránd University, Faculty of Education and Psychology), for permitting us to use the TAS-20.

¹⁵ [Cserjési et al. \(2007\)](#), in the Hungarian version of the measure, use the alternative term "Pragmatic Thinking" instead of Externally Oriented Thinking; the former will be used in the present thesis.

score between 20 and 100. [Taylor et al. \(1997\)](#) suggest that scores between 21 and 51 indicate the lack of alexithymia (i.e., healthy “lexithymic” emotional processing), scores between 52 and 60 show a hardship in accessing and identifying emotion (i.e., subclinical alexithymia), and scores above 60 mark alexithymic processing that should be addressed by a clinician. The factors and the entire scale showed sufficient internal consistency (Cronbach alpha for the total scale = .81). The scale was adapted to Hungarian by [Cserjési et al. \(2007\)](#). The Hungarian TAS-20, similarly to the original, showed good reliability and validity. One item (No. 20) loaded to another factor than in the original; in the current investigation, this modified factor solution was applied. Although the TAS-20 was developed for clinical purposes, the scale seems to be a viable tool for investigating lexithymia—the ability to recognize and express emotions—as well, which is an important component of mentalization. In the classification of [Baron-Cohen et al. \(2001\)](#), lexithymia covers the second phase of the mentalizing process: It is a conscious, effortful cognitive elaboration of somebody’s own emotional states.

5.5. Testing Hypnotic Susceptibility

5.5.1. Harvard Group Scale of Hypnotic Susceptibility, Form A (HGSHS:A)

The HGSHS:A ([Shor & Orne, 1962](#))—the group version of the SHSS:A ([Weitzenhoffer & Hilgard, 1959](#))—is one of the most popular standardized measures of hypnotic behavior.¹⁶ The scale consists of mainly ideomotor and motor challenge suggestions; however it includes a suggestion for fly hallucination and another one for posthypnotic amnesia. These items, together with the posthypnotic suggestion for touching the ankle at a given signal, are usually grouped into a “perceptual-cognitive” factor, although they also have motor components. The suggestions are listed in **Table 5**.

Table 5 | The test suggestions, passing criteria, and factor structure of the Harvard Group Scale of Hypnotic Susceptibility, Form A ([Shor & Orne, 1962](#))

	Test Suggestion	Passing Criterion	Factor
1.	Head Falling	Head falls at least 2.5 inches (5 cm) before the end of the suggestion	DM
2.	Eye Closure	Closes eyes before directly instructed to do so	DM
3.	Hand Lowering	Lowers at least 6 inches (15 cm) by end of 10-second timed interval	DM
4.	Arm Immobilization	Arm rises less than 1 inch (2.5 cm) in 10-second timed interval	MC
5.	Finger Lock	Incomplete separation of fingers at end of 10 seconds	MC
6.	Arm Rigidity	Less than 2 inches (5 cm) of arm bending in 10 seconds	MC
7.	Hands Moving	Hands as close as 6 inches (15 cm) apart	DM
8.	Communication Inhibition	No movement of the head in 10 seconds	MC
9.	Fly Hallucination	Any movement, grimacing, acknowledgement of effect	PC / DM
10.	Eye Catalepsy	Eyes remain closed at end of 10 seconds	MC
11.	Posthypnotic Action	Any partial movement response at posthypnotic signal	PC
12.	Posthypnotic Amnesia ^a	Recall of 3 or fewer items (from Hand Lowering to Posthypnotic Action)	PC / PA

Note. DM = direct motor, MC = motor challenge, PC = perceptual-cognitive, PA = posthypnotic amnesia suggestion.^a Although Posthypnotic Amnesia is organized into a separate factor, usually it also loads with a loading over .25 on the DM factor, as it facilitates the subject to touch her or his left ankle.

¹⁶ For ethical reasons, the entire protocol of the HGSHS:A is not published here.

Usually, the HGSHS:A is presented to a group of people of various group sizes by a qualified hypnotic operator. The administration can be live or tape-recorded. Following a standardized, approximately 7-10 minute-long hypnotic induction, the H gives twelve test suggestions, also in a standard manner. Following dehypnosis, the Ss report about their behavior in a scoring booklet which contains the description of the suggestions and the criteria of “passing” the given suggestion.

In the vast majority of the studies, scoring of HGSHS:A is based on the retrospective reports of the Ss: Following dehypnosis, first they list the suggestions they remember, than the posthypnotic amnesia is cancelled. After that, they read the suggestions and mark if they passed them according to the criteria in **Table 5**. This is the so-called *self-scoring*.

There is, however, another method: Trained observers can be employed to record and evaluate the behavior of the Ss as it is seen from the outside ([Bentler & Hilgard, 1963](#)). The observers decide whether the S passed the given suggestion or not upon the same system of criteria, thus carrying out *observer-scoring*. In our laboratory, undergraduate or graduate psychology students who take part in seminars on hypnosis research and receive training in the method usually take this task. An observer usually registers the behavior of 3 to 5 subjects.

Subjects can be categorized into groups based on their hypnotizability scores. Those who score 0–4 on HGSHS:A are classified as low hypnotizables (LH) or “lows”. Subjects scoring 5–7 are considered medium hypnotizables (MH) or “mediums”. Those scoring 8–12 belong to the group of high hypnotizables (HH) or “highs”; extreme scorers (scoring 0–1 or 11–12) are sometimes also differentiated ([Register & Kihlstrom, 1986](#)).

A HGSHS:A session can be seen on **Figure 3a**. The hypnotic behavior of the subjects is a valid index of hypnotic susceptibility (based on rather refined criteria). The Ss’ evaluation of their own behavior, however, may be distorted by their altered perception, cognition, and memory, even if they attempt to evaluate their behavior “objectively”. For instance, a subject may not be able to precisely decide if her or his hand lowered less or more than 15 centimeters in the hand lowering suggestion (**Figure 3b**). On the other hand, the observers’ decisions may also be distorted, because they may not correctly detect very subtle eye movements, or may have a general bias towards “over-scoring”. Although the correlation between self-scores and observer-scores is usually over .80 (e.g. [Bentler & Hilgard, 1963](#)), these discrepancies reflect systematic biases in self- and observer-scores ([Varga, Farkas, et al., 2012](#)). Consequently, applying both scoring system enhances the ecological validity of HGSHS:A.

According to [Woody et al. \(2005\)](#), ideomotor, motor challenge, perceptual-cognitive, and amnesia-generating suggestions form “multiple hypnotizabilities” and they are distinct building blocks of hypnotic responsiveness. While HGSHS:A taps particularly into the first two blocks, it is poor in predicting the responses of Ss to perceptual-cognitive alterations, while the SHSS:C and the WSGC give very detailed picture on those aspects.¹⁷ On the other hand, they emphasize that HGSHS:A is an excellent single measure of “general hypnotizability”, the underlying aptitude to respond to hypnotic suggestions, which can be conceptualized as a personality trait.

A later investigation by [Benham et al. \(2006\)](#), in which structural equation modeling was used, confirmed the presence of such a general disposition, independent from the Ss’ expectations of their hypnotic performance. Several studies prove the reliability and the validity of HGSHS:A to assess general hypnotizability. It seems to be the most popular measure of hypnotic responsiveness, adapted to fourteen languages so far, including Hungarian ([Költő et al., 2015](#)). Previous studies revealed that Hungarian HGSHS:A is organized into the same factorial structure as in other languages ([Költő et al., 2013](#)).

¹⁷ In Posthypnotic amnesia, in the opinion of Woody and his colleagues, is poorly represented in all of the above mentioned scales. They recommend supplementing the scales with suggestions for other phenomena of amnesia.



Figures 3a, b | A group hypnosis session with HGSHS:A. The photo on the top (a) depicts a HGSHS:A session. The hypnotist is standing in the middle; she is informing the subjects who are sitting, facing her. The observers can be seen next to the hypnotist, facing the subjects. The photo on the bottom (b) illustrates two reactions to the hand lowering suggestion of HGSHS:A. The male subject wearing a black T-shirt seems not to respond to the suggestion, holding his left arm firmly, in the height as he put before getting the hand lowering suggestion. The female subject wearing a plaid shirt seems to respond to the hand lowering suggestion. Photos republished with the permission of <http://www.origo.hu> and all participants. Photography © András Hajdú D.

5.5.2. Archaic Involvement Measure (AIM)

As outlined in Section 1.3 on the clinically inspired theories of hypnosis, [Shor \(1962\)](#) warned against viewing hypnotic susceptibility solely as a pattern of behavioral response. He posited that besides behavior and experiences, the S's emotions towards the hypnotist—archaic involvement—is also an integral part of hypnotic responding. The most popular empirical tool to investigate this affective dimension is the AIM¹⁸, developed by [Nash and Spinler \(1989\)](#). Subjects fill in the measure immediately after hypnosis. The AIM originally consisted of 19 items, organized into three factors: (1) *Perceived power of the hypnotist* (e.g., “Every word or action of the hypnotist seemed to have an effect of my feelings”); (2) *Positive emotional bond to the hypnotist* (e.g., “For some unknown reason, I really wanted to please the hypnotist a lot”); and (3) *Fear of negative appraisal [by the hypnotist]* (e.g., “I really wanted the hypnotist to think I was OK”). The subjects marked how much they felt the affect described by the given item towards the hypnotist on a 7 point Likert scale (from 1 to 7). The reliability of the factors and the scale overall (Cronbach alpha = .94) was sufficient.

The AIM was translated to Hungarian by [Bányai et al. \(1990\)](#), who noted that the scale concentrates only on positive emotions and it does not tap into the possible negative affects towards the hypnotist. Administering the negative versions of all the 19 items (e.g., “For some unknown reason, I really wanted to please the hypnotist a lot” → “For some unknown reason, I really wanted to do against the hypnotist”) led to a floor effect, i.e., the vast majority of the Ss did not report any negative feelings. Finally, three most often selected negative items were added to the scale, arriving to a 22-item Hungarian version of the AIM ([Bányai et al., 2001](#)). Factorial analysis of this version indicated that the three factors are slightly different from the original, namely, (1) *Admiration and bonding to the hypnotist*; (2) *Fear of negative appraisal*; and (3) *Need for dependence* (e.g., “I wanted the hypnotist to take care of me while I was in hypnosis”). The three positive factors can also be summed up, leading to a positive total score (AIM+), while the three negative items form AIM-. These are calculated from summing up the single item scores; the positive factors are averaged from the respective items, leading to a score between 1 and 7 for each factor. The scale also proved to be reliable in the Hungarian sample (Cronbach alpha = .93).

5.5.3. Phenomenology of Consciousness Inventory (PCI)

The third dimension in Shor's (1962) multi-facet account of hypnotic susceptibility covers the experiences related to specific hypnotic state of awareness. There is a long tradition of attempts to assess these experiences ([Varga, 2013](#)). Despite its length, the most popular quantitative measure to investigate the phenomenological changes occurring in ASCs is the PCI ([Pekala, 1982, 1991](#)).¹⁹ It is a self-report questionnaire consisting of 53 items, filled in by the subject after the hypnosis session or any other activity which may provoke ASC, including monotonous drumming and shamanic rituals ([Szabó, 2001](#)), dance ([Szirmai, 2009](#)), sexual intercourse, various leisure and working activities ([Józsa, 2012](#)). PCI was adapted to Hungarian by [Szabó \(1989\)](#). The items contain complementary statements, and the S has to decide on a 7 point Likert scale which statement describes her or his experience better. Such an item is:


My state of consciousness was not any different or unusual from what it ordinarily is.	0	1	2	3	4	5	6	I felt in an extremely different and unusual state of consciousness.
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¹⁸ I am grateful to Prof. Dr. Michael Nash (University of Tennessee, Knoxville, Department of Psychology) who gave permission to our laboratory to use the AIM. The Hungarian version can be found in Appendix F.

¹⁹ I am grateful to Dr. Ronald Pekala (private practice, West Chester, Philadelphia), who kindly permitted the ELTE Hypnosis Laboratory to use the PCI. The Hungarian version can be found in Appendix G. It has to be noted, however, that other researchers shall also obtain his permission to apply the questionnaire. The English version of the PCI can be downloaded after registration from Dr. Pekala's homepage, <http://www.quantifyingconsciousness.com>, where conditions of use can also be found.

The scale includes 12 main and 14 subdimensions. Each subdimension consists of 2-3 items. The scores given to singular items are summed up for subdimensions, and the sums of the scores on the subdimensions are toted up for each main dimension. Thus, the scale does not have a general total score, but it gives a “profile” on the alteration of the experiences for the given ASC. The scale also includes a reliability index that is calculated upon the similarity of responses for similarly formulated items. Pekala and his colleagues have accumulated most of the empirical evidence on applying PCI to experimental hypnosis sessions. In their practice, usually the Ss fill in the questionnaire regarding a few-minute interval inserted immediately before dehypnosis. In this short interval, the Ss are asked to sit calmly with their eyes closed and just direct their attention to their actual state (Angelini, Kumar, & Chandler, 1999). As opposed to this practice, the Ss in our lab have to fill in the PCI considering the whole hypnosis session. The main dimensions and the subdimensions showed good reliability (Cronbach alpha values were around .7–.9) in both the original and the Hungarian studies.

Table 6 | The original and the modified factor structure of the Phenomenology of Consciousness Inventory, based on Pekala (1991) and Kumar, Pekala, and Cummings (1996).

26 original factors of PCI		5-factor PCI
Altered experience	 Z-transformation and weighing of the factors	Dissociative control
Altered body image		
Altered time sense		
Altered perception		
Altered meaning		Positive affect
Positive affect		
Joy		
Sexual excitement		Negative affect
Love		
Negative affect		
Anger		Visual imagery
Sadness		
Fear		Attention to internal processes
Attention		
Direction (inward)		
Absorption		
Visual imagery		
Amount		
Vividness		
Self-awareness		
Altered state of awareness		
Arousal		
Rationality		
Volitional control		
Memory		
Internal dialogue		
Reliability index		

Note. In the original structure, the 12 first-order factors are set in **bold letters**, and the 14 second-order factors in regular letters.

Although the 26-factor solution (see the left column in **Table 6**) gives a very detailed overview on the phenomenological pattern related to specific ASCs, sometimes it can be a hindrance to deal with such a big amount of data (especially when both participants of an interaction fill in PCI). Therefore, Kumar et al. (1996) developed a simpler, five-factor scoring system (see the right column in **Table 6**) for the questionnaire. The basis of this simplification was a dataset obtained following laboratory hypnosis sessions. These five factors are derived from the original factor structure as it follows: The original factor scores are z-transformed and then weighed with the original factorial loads.²⁰ The five factors are as follows:

²⁰ The table containing the original factor loadings needed for transforming PCI’s original 26 factors to 5 main factors is presented in Appendix H.

- (1) **Dissociated control:** It consists of phenomenological aspects of trance, related to alterations in the consciousness (expressed by inferior dimensions as Body image, Time sense, Perception, Visual imagery, Meaning) which are also associated with the operation of many psychological functions (expressed by Memory, Rationality, Volitional control, and Internal dialogue).
- (2) **Positive affect:** It consists of pleasant experiences related to hypnotic ASC, including the feelings of Joy, Sexual excitement, Love (and to a lower extent, Altered meaning, Body image and Perception).
- (3) **Negative affect:** It includes unpleasant experiences, such as Anger, Sadness, Fear, Arousal (and lower scores on Rationality).
- (4) **Visual imagery:** Higher scores express an increased functioning of Amount and Vividness of imagery under hypnosis.
- (5) **Attention to internal processes:** It consists of alterations in time sense, perception, absorption, the inward orientation of attention, altered awareness, intensified internal dialogue and low scores on vividness of imagery.

Both the 26- and the 5-factor solution of the PCI showed significant associations with behavioral hypnotizability scores as measured with HGSHS:A or SHSS:C ([Kumar, Pekala, & McCloskey, 1999](#); [Varga, Jozsa, Banyai, Gosi-Greguss, & Kumar, 2001](#)). These data give a strong support to the state theories of hypnosis and suggest that PCI is a valid and reliable measure of alterations in consciousness under hypnosis.

5.6. Statistical Analysis

Although the present thesis is argumentative in character, we have no direct evidence whether or not parental rearing style, mentalization and hypnotic responding are interrelated. Therefore the data collection and analysis follows an explorative path, with the confirmative examination of some previously verified relationships between the variables. For basic statistics, SPSS 19.0 statistical software for Windows was used. **Figure 4** shows the successive steps of statistical analysis and (marked with red arrows) the hypotheses that were tested with the respective techniques. As you can see in the figure, first reliability and structural validity of the applied measures were tested; I conducted confirmatory factor analysis (CFA) to justify the pre-set factorial organization of the measures. Cronbach alpha values and intercorrelations (between factors of the given measure) were also calculated. Then mean scores of the given measures and factors—where possible—were compared to reference values, published in Hungarian standards or in other large-sample studies. Correlations were calculated between different tests of mentalization, and tests of hypnotic responses, to check the convergent validity between different measures of the same construct.

The next step was to investigate associations and causal links between the measures; besides inter-constructs correlations, multiple (hierarchical) linear regression and simple nonlinear regression analyses were conducted. To see whether parents can be classified based on their parenting style, K-means cluster analyses were performed separately for the mothers and the fathers. Since the cluster analysis gave meaningful results, the Ss were compared for their mentalizing skills and hypnotic responses, grouped by the parental clusters; for these investigations, one- and two-way ANOVA were performed.

To investigate whether mentalizing skills mediate between parental behavior and hypnotic responses, mediation analyses were performed. Based on previous findings and theoretic papers, I also aimed to control the effect of some background variables, including the gender and the profession of the Ss, and the experimenter effect. Many of the analyses were controlled for these variables. The data obtained from online administration were compared to results of earlier, paper-and-pencil testing.

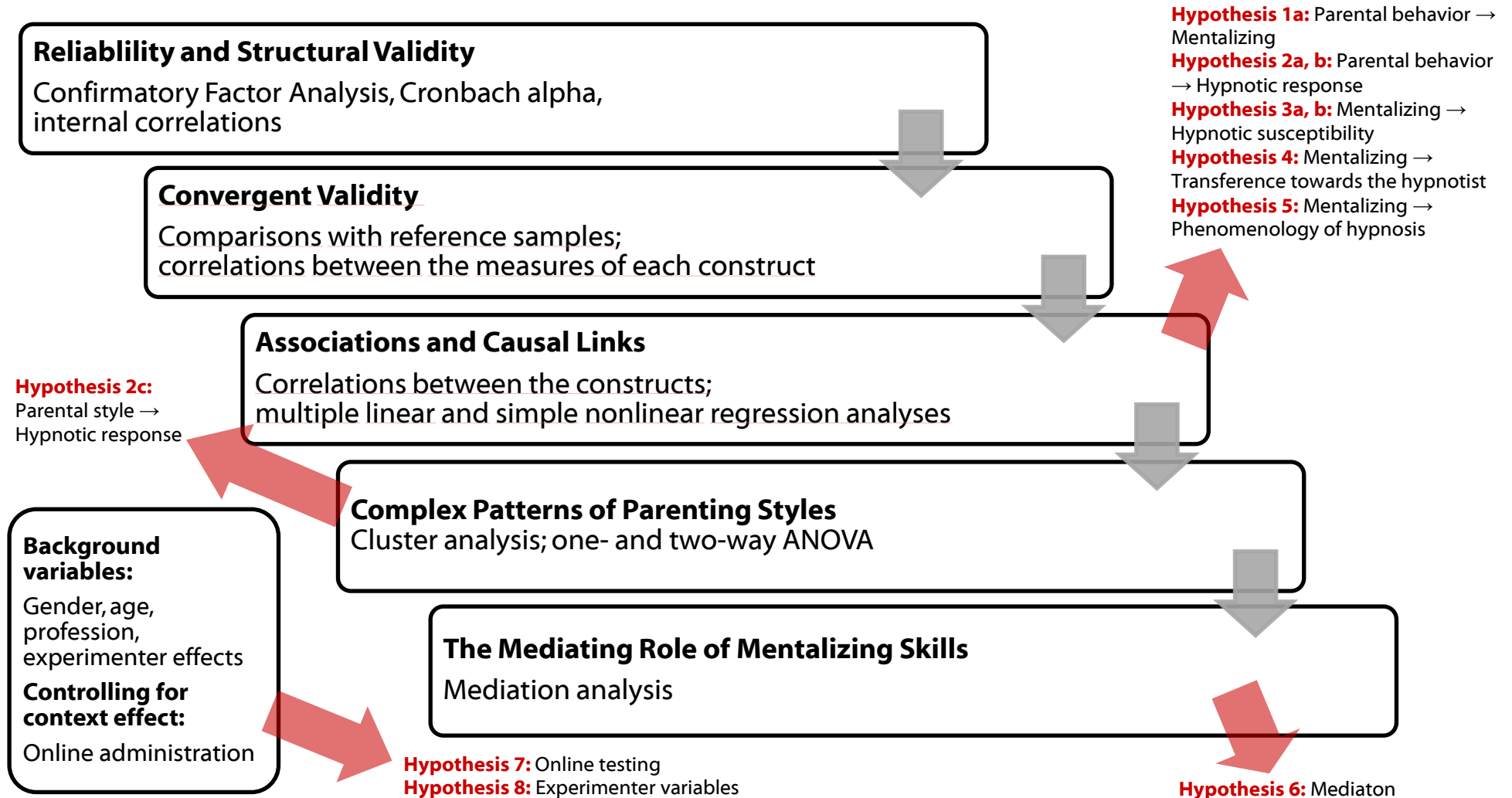


Figure 4 | Design of the statistical analysis.
Note. Each block show a separate step of the analysis; the red arrows indicate which hypotheses were tested in the respective phase.

5.6.1. Descriptive Analysis; Tests of Reliability and Structural Validity

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 Student *t*-tests and one-way ANOVA. If Levene tests indicated a violation of normal distribution,²¹ their robust nonparametric versions, Mann-Whitney test and Kruskal-Wallis test were applied. For multiple groups, post hoc comparisons were also applied. When contrasting the present findings to reference samples, since the raw data were not available, an online calculator was used (Usable Stats 2-Sample *t*-test Calculator, <http://www.usablestats.com/calcs/2samplet&summary=1>). Correlations across genders or in other subgroups were compared using Fisher's *r*-to-*z* transformation (<http://vassarstats.net/rdiff.html>). Linear and quadratic regression analyses were performed to uncover hypothesized causal analyses.

Confirmatory Factor Analysis (CFA) was conducted for each measure, to check whether the present data fit the previously set factor solutions. CFA works well for normally distributed continuous variables. For the analysis of binary items (like the items of HGSHS:A, which are scored on a 0-1 basis), a special statistical apparatus is required. Therefore the structure of HGSHS:A was investigated by exploratory factor analysis. CFA enables researchers to check whether their data fit the hypothetical models with different factor numbers or solutions (Byrne, 2010). For CFA analyses, AMOS 22 statistical software (Arbuckle, 2013) was used. The basic idea behind CFA is that we compare the covariance matrix of a hypothetical model with the actual data. The extent to which the two fit each other indicate whether our data correspond with a hypothesized system of the variables (in the case of CFA, a pre-set factor structure, derived from earlier observations). An important prerequisite for CFA is that the variables in the model follow normal distribution. Given that SEM models treat the covariance estimates together, individual deviations from zero skewness and kurtosis are summing up and may seriously compromise the fit indices (especially via inflating χ^2 values). A solution is to transform the variables to follow a more balanced distribution or to use fit indices that are adjusted for non-normality (Byrne, 2010; Satorra & Bentler, 2001). Anyhow, results of CFA conducted on non-normally distributed data should be treated with caution.

There are many numerical indices of model fit, and there is no clear consensus about the number and criteria of them from which we could infer that a data set fits a hypothetical model “perfectly”; there is, however, a widely accepted set of the fit indices that should always be published. Above I summarize the basic fit indices and their values that, according to the majority of the authors, generally indicate acceptable fit (Urbán, 2010; Byrne, 2010; Brown, 2015; Hu & Bentler, 1999).

The most fundamental index is **CMIN** (χ^2), which expresses the minimal discrepancy between the unrestricted (hypothetic) and restricted (observed) covariance matrix, which follows a chi-squared distribution. The smaller the CMIN, the better is the fit. In ideal cases we accept CMIN if it is not significant. However, CMIN is considered to be too “idealistic”, as in cases of large samples, it is almost always significant. Therefore, it is recommended to divide CMIN with the degree of freedom (the number of estimated parameters in the model). **CMIN/df** proportion under 2 suggests very good model fit; a value not essentially different from the range between 2 and 5 indicates acceptable fit.

The Comparative Fit Index (**CFI**) is based on a comparison between the hypothetical (null) model and the observed covariances. It is accepted if it is close to or larger than .90 (very good fit is indicated by $CFI \geq .95$).

A version of this is the Tucker-Lewis Index (**TLI**), which follows a similar logic, but is corrected for the non-normality resulted by sample size. Similarly to CFI, $TLI \geq .95$ indicates very good fit, but it is acceptable around or over .90.

Root Mean Square Error of Approximation (**RMSEA**) reflects the discrepancy between a model with unknown but optimally chosen parameters and the observed data; the smaller it is, the better is the fit. RMSEA under or around .05 (according to some authors, under .06) indicates good fit; values between .08 and .10 express mediocre fit; $RMSEA > .10$ reflects poor fit. RMSEA usual-

²¹ Levene tests and their results are not reported here. You can infer violation of normality where nonparametric test results are presented.

ly does not stand alone but it is accompanied by its 90% confidence interval. If .05 falls within this confidence interval, the model is not rejected.

The latter condition is reflected by the **PCLOSE** value: if PCLOSE is below .05 (i.e., it is not significant at a level of $p = .05$), the model can be accepted.

If we compare more models (for instance, a unidimensional, one-factor solution is compared to a structure where items of the measure are organized into more factors, or there are competing factor solutions), the Akaike Information Criteria (**AIC**) have to be monitored. Of the alternative solutions, the one with the smallest AIC shows the best fit. We can also compare the models pairwise, according to the change in CMIN value and degree of freedom: If the difference is significant, the model with the largest deviation in CMIN ($\Delta\chi^2$) fits better (Satorra & Bentler, 2001). **Table 7** summarizes the above outlined indices and the reference values to which the present findings will be contrasted. It is important to emphasize, however, that these values are not carved into stone, because the recommended cutoff values may fluctuate depending on the modeling conditions (Brown, 2015).

Table 7 | Reference values for the fit indices in Confirmatory Factor Analyses (CFA)

CFA Fit Index	Reference Value
CMIN	not significant
CMIN/df	< 2 (< 5 acceptable)
CFI	≥ .90
TLI	≥ .90
RMSEA	≤ .05 (≤ .08 acceptable)
PCLOSE	not significant
AIC	smallest of the competing solutions
$\Delta\chi^2, \Delta df$	significant

5.6.2. Analyses of Associations, Clusters and Mediation

Associations between the variables were tested with Spearman correlations and linear and nonlinear regression analysis. To see whether mentalization skills mediate between parental rearing style and hypnotic responding, mediation analyses were conducted.

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. Although parental emotional warmth, (over)protection, rejection, and punishment show moderately significant correlations with hypnotic responding (Költő, 2008), it was a question whether specific patterns of parental behavior or single elements of this pattern influence the adult's hypnotic responses. This was our reason for applying cluster analysis on the EMBU subscales. In their methodological paper, Clatworthy, Buick, Hankins, Weinman, and Horne (2005) listed five pieces of information which a proper report on cluster analysis should contain. These are: (a) The software used for the analysis; (b) The similarity measure used to group people into clusters; (c) The clustering method; (d) The procedure used to determine the number of clusters; and (e) Evidence for cluster validity. There are many methods to investigate how subjects are organized into clusters in a space of two or more variables (Norušis, 2012). In *hierarchical cluster analysis*, each subject first belongs to an individual cluster (with 1 member), and these clusters are gradually merged based on their similarity. The final solution is one single cluster which contains every subject. The researcher shall decide where to "stop" the process. The hierarchical method works well for small sample sizes but it is not viable for large samples. In the *K-means method*, the researcher first sets the number of clusters (K), and the subjects will be clustered around as many centroids as many clusters were set. Just like for the other statistical analyses, the SPSS 19.0 statistical software for Windows was used for cluster analysis. It provides many different options for cluster analysis, including the "Two-step" method that does not require presetting the number of clusters. However, as we have a hypothetical cluster structure including 4 groups for both parents (set by the Cold–Warm and the Controlling–Permissive dimensions), the simple K-means analysis seemed to be the best way to categorize parents according to their rearing styles. Given that in hypnosis research—to the best of my

knowledge—such an analysis has not been carried out so far, I will describe further details of how the analysis was carried out.

If a part of the influence of parenting style on hypnotic responses is transmitted by mentalization skills, we talk about mediation. A variable mediates between a predictor and an outcome, if the effect of the predictor → outcome decreases significantly, or even disappears, if we control for the mediator. This effect can be tested with mediation analysis, which is based on investigating regressions between the hypothesized predictor → mediator, mediator → outcome causal links, and the predictor → outcome association uncontrolled and controlled for the mediator (Baron & Kenny, 1986). From the unstandardized (raw) regression coefficients, Sobel-*z* statistics were calculated (Sobel, 1982). If the Sobel-*z* is significantly higher than 1.96, there is a mediation effect. If controlling for the mediator lowers the predictor → outcome association, it is a partial mediation; if it makes the association insignificant, we speak about full mediation. Standardized indirect effects and proportions of the mediation effect from the total effect were also computed. For computation of mediation effects, based on the Baron & Kenny approach, the calculator developed by Beckstead (2009) was used. More details on mediation analysis will follow alongside the empirical results.

5.6.3. Effect Sizes, Statistical Power and Correction for Multiple Testing

Level of significance, although prevailing in current academic psychology (oftentimes being the only evidence for a statistical effect), is not sufficient, as it does not say anything about the magnitude of the effect (A. Field, 2009). The problems of null hypothesis testing are summarized by Ioannidis (2005). He suggests attempting the replication of earlier findings, using large sample studies, reporting any conflicting interests, and taking effect size and power in consideration. Reporting the latter two are also strongly encouraged by Cohen (1990), who warned against depending on significance testing. He emphasizes “the importance of power analysis and the determination of just how big (rather than how statistically significant) are the effects that we study (...) there is no royal road to statistical induction” (p. 1304). In the present thesis, these issues are addressed. Effect sizes were computed for all statistical tests, apart from correlations and regression analyses (where the coefficients *per se* indicate the effect size) and SEM (based on goodness-of-fit indices). Calculations were carried out either manually or with Becker’s (http://www.uccs.edu/lbecker/index.html#means_and_standard_deviations) online effect size instrument. Cohen-*d* values (*d*) and standardized effect size *r* values (r_{ES}) are provided. Estimates of statistical power—if not provided by SPSS—were calculated *post hoc*, with the G*Power 3.1.3 software, developed at Düsseldorf University (Faul, Erdfelder, Lang, & Buchner, 2007), based on obtained Cohen-*d* or *f* values and a hypothetic Type I error probability of .05. G*Power 3.1.3 does not contain an algorithm to calculate power of Kruskal-Wallis tests. For these, the power of the respective parametric ANOVA was used, corrected with an asymptotic relative efficiency of .955 (Prajapati, Dunne, & Armstrong, 2010).

Effect sizes for Mann-Whitney tests, the robust version of Student *t*-test, were calculated with the above formula:

$$r_{ES}(M-W) = \frac{z}{\sqrt{N}} \quad (1)$$

where *z* is the test value for the Mann-Whitney test and *N* is total sample size. Following the guidelines of Cohen (1977), small effect size is indicated by $r_{ES} \approx .10$, medium effect size by $r_{ES} \approx .30$, and large effect size by $r_{ES} \approx .50$.

Effect size omega (ω), the general indicator of the magnitude of effect in one-way ANOVA, was calculated as follows:

$$\omega = \sqrt{\frac{SS_{between} - df_1 \cdot MS_{between}}{SS_{total} + MS_{within}}} \quad (2)$$

where $SS_{between}$ is the sum of squares between groups, SS_{total} is sum of total squares, MS_{within} is mean of squares within groups, and df_1 is the degrees of freedom derived from the number of the groups compared to each other. For omega, the same cutoffs (.10, .30 and .50, respectively) indicate small,

medium and large effects as for r_{ES} . For two-way analyses, partial eta-squared (η_p^2) was used instead, which expresses the size of the *partial* effect of given predictors *controlled for each other*.

For multiple regression analysis, Cohen's effect size f^2 was calculated like above:

$$f^2 = \frac{R^2}{1-R^2} \quad (3)$$

where R^2 is the adjusted R squared which explains the variance in the outcome (dependent) variable by the predictor variable(s). Small effect size is suggested by $f^2 \approx .02$, medium effect size by $f^2 \approx .15$, while f^2 around or above $.35$ indicates large effect size ([Cohen, 1977](#)).

Significance level for all analyses was set at $.05$, two-tailed. Confidence intervals are given for 95% level. Due to a 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](#)).

6. TESTING RELIABILITY AND STRUCTURAL VALIDITY OF THE MEASURES

BEFORE THE ANALYSES of the hypothesized associations, first the descriptive data and investigations on reliability and validity will be presented. Principles of data reduction will be described. When previous results—from normative examinations or other large-sample investigations—were available, I compared the data obtained within the current research to them. Reliability was checked with calculating measures of internal consistency for total and factor scores of the measures and with making comparisons with normative findings. Structural validity was checked by using confirmatory factor analysis, to probe whether the factorial organization of the given measure fits the previously developed models. The HGSHS:A could not be subjected to CFA, since it consists of binary (Yes/No) items (the S rates whether or not s/he passed the given suggestion according to the criteria listed in **Table 5**). Therefore, the internal structure of the HGSHS:A was investigated with exploratory factor analysis. Besides structural validity, it is a question whether the measures show acceptable content and convergent validity, meaning that they cover the psychological concepts that the authors intended to assess, and that measures of related concepts show association in terms of correlation. Since I only applied measures in the present investigation that are used in many other research projects and that are frequently cited in the literature, no additional investigation was made to warrant the content validity. In the next chapter, associations between the applied measures will be presented, which also serve as indicators of convergent (and discriminant) validity.

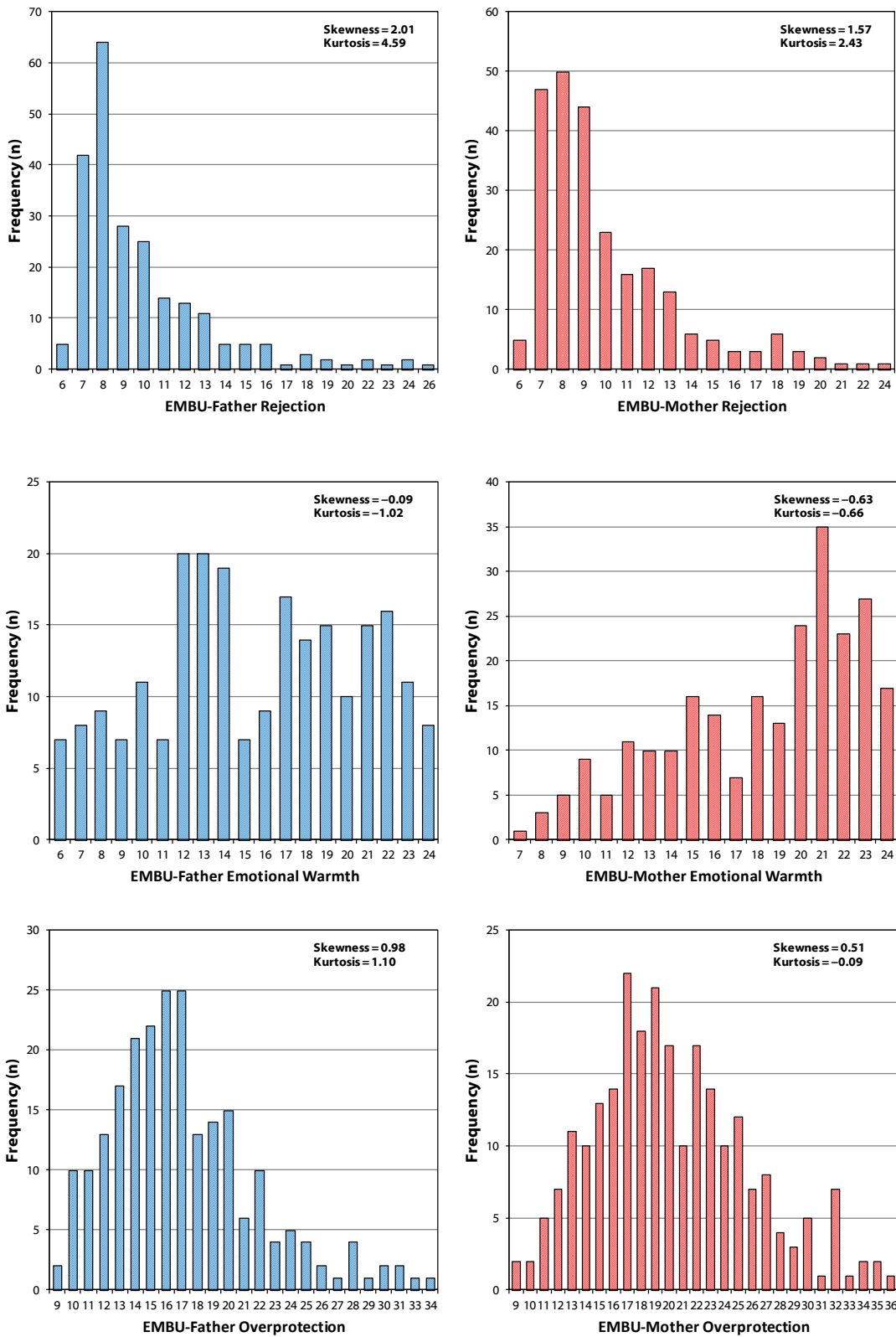
6.1. “My Memories of Upbringing” Questionnaire (EMBU)

The 23-item version of EMBU was validated in Greek, Guatemalan, Hungarian, and Italian samples. This form of the questionnaire was supplemented with items on family composition and love towards the parents the S felt in her/his adolescence and at the time of administration of the questionnaire. The exploratory factor analysis revealed a 3-factor structure in all four countries: the items construe three factors termed *Emotional Warmth*, *Rejection*, and *Overprotection* ([Arrindell et al., 1999](#)). To assess the parents’ punitive behavior, an additional operational scale, *Punishment* is calculated from the relevant items of the Rejection and Overprotection scales ([Költő, 2008](#); [Heller, 2011](#)). The scores obtained in the current sample are compared with the original Hungarian score means. Indicator of internal consistence, Cronbach-alpha was also calculated for EMBU scales.

Given that in the normative investigation of Arrindell and his colleagues the means of the EMBU scores for the overall scale and for the factors are not reported, the current score means are compared to another research project in which memories of parental rearing of 196 young healthy adults was assessed with this measure ([Költő, 2008](#)). You can read the data on the mean scores in **Table 8**.

To check whether the variables show normal distribution, Rejection, Emotional Warmth, and Overprotection of the father and the mother were plotted (see the histograms under **Figures 5a-f**), and their kurtosis and skewness were calculated. It would be counter-intuitive to expect them to follow a bell curve; if the majority of the Ss were raised by “normal” parents, values of parental emotional warmth should rather skew to the left (having a peak at higher love and caring of the parents), while scores of parental rejection and overprotection should be rather skewed to the right, with the most Ss scoring their parents low.

The final factor structures in the present study, separately for the father’s and the mother’s EMBU items are depicted in **Figures 6** and **7**, respectively. Results of the CFA can be found in **Tables 9** and **10**, respectively.



Figures 5a-f | Distribution of scores on EMBU subscales in the present study (left side: fathers, right side: mothers)

The histograms show that distribution of Rejection scores of both parents skew to the right (with peaks at the low scores). Fathers' Emotional Warmth scores are not skewed, while that of mothers' skews to the left. Scoring on Fathers' and Mothers' overprotective behavior has negative skew, although that of mothers skews more evenly.

Table 8 | Mean scores and internal consistency of EMBU subscales in [Arrindell et al. \(1999\)](#), [Költő \(2008\)](#), and the present sample

Subscale	No of items	Arr. (1999) ^a	Költő (2008) (N = 196) paper-and-pencil			Present sample ($M_{\text{father}} = 230$, $M_{\text{mother}} = 246$, $N_{\text{parents}}=229$) Internet-based				Difference					
		Cr-alpha	<i>M</i>	<i>SD</i>	Cr-alpha	<i>M</i>	<i>SD</i>	SE	Cr-alpha	<i>t</i>	df	sig. ^b	<i>d</i>	<i>r</i> _{ES}	power
Father rejection	7	.72	10.52	3.48	.789	9.94	3.56	.23	.829	1.692	423	ns.	.16	.08	.50
Mother rejection	7	.75	11.02	3.61	.791	10.02	3.33	.21	.775	3.021	440	.003	.28	.14	.57
Parent rejection	14	–	21.54	6.4	.863	19.96	6.19	.41	.868	2.582	423	.01	.25	.12	.59
Father emotional warmth	6	.85	15.73	4.68	.885	15.53	5.01	.33	.880	0.423	423	ns.	.04	.02	.11
Mother emotional warmth	6	.81	18.36	4.16	.86	18.26	4.39	.28	.863	0.243	440	ns.	.02	.01	.07
Parent emotional warmth	12	–	34.09	8.04	.911	33.79	8.64	.57	.913	0.368	423	ns.	.04	.02	.11
Father overprotection	9	.77	17.55	4.86	.789	17.05	4.78	.32	.790	1.067	423	ns.	.10	.05	.26
Mother overprotection	9	.78	24.54	5.18	.795	20.21	5.62	.36	.828	8.325	440	< .001	.78	.36	> .99
Parent overprotection	18	–	39.17	9.11	.86	37.31	9.27	.61	.870	2.078	423	ns.	.20	.10	.65
Father punishment	8	–	12.36	3.71	.778	11.73	3.80	.25	.806	1.722	423	ns.	.17	.08	.54
Mother punishment	8	–	13.55	3.91	.771	12.41	3.96	.25	.801	3.023	440	.002	.29	.14	.55
Parent punishment	16	–	25.91	6.81	.851	24.16	6.93	.46	.864	2.616	423	.009	.25	.13	.58

Note. ^aArrindell et al.—in the publication of the Hungarian standard of EMBU—do not report any descriptive statistics. All comparisons were carried out with assuming equal variances; for unequal variances the same pattern was found. ^bAdjusted for Holm-Bonferroni criteria.

In the current sample, respondents reported about significantly less rejective, overprotective, and punishing mothers and parents than in a previous study. Nevertheless, the effects are weak, except for the difference in mothers' overprotective behavior that shows medium effect size difference.

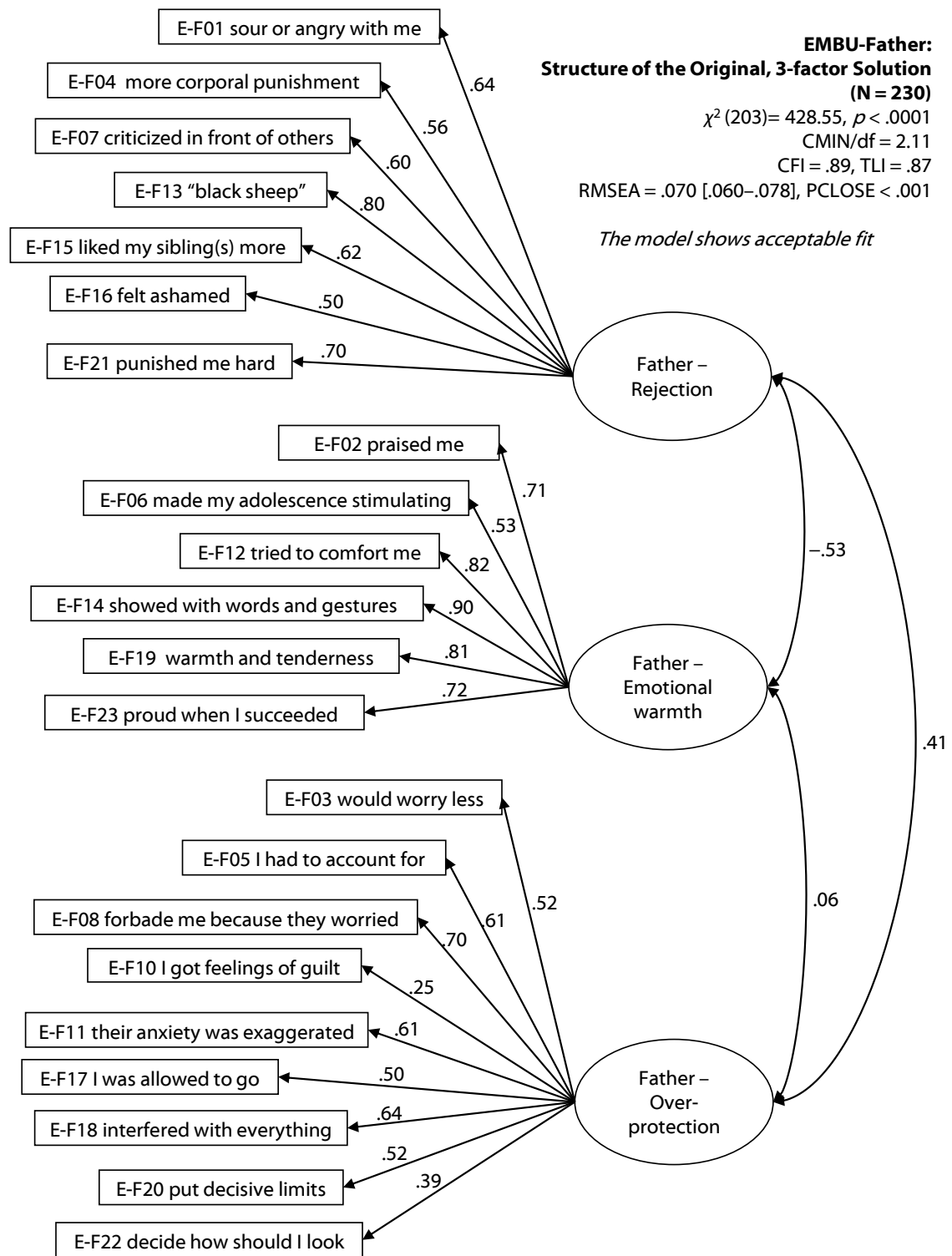


Figure 6 | Factor structure for the EMBU-Father questionnaire.
Note. All coefficients are significant ($p < .001$).

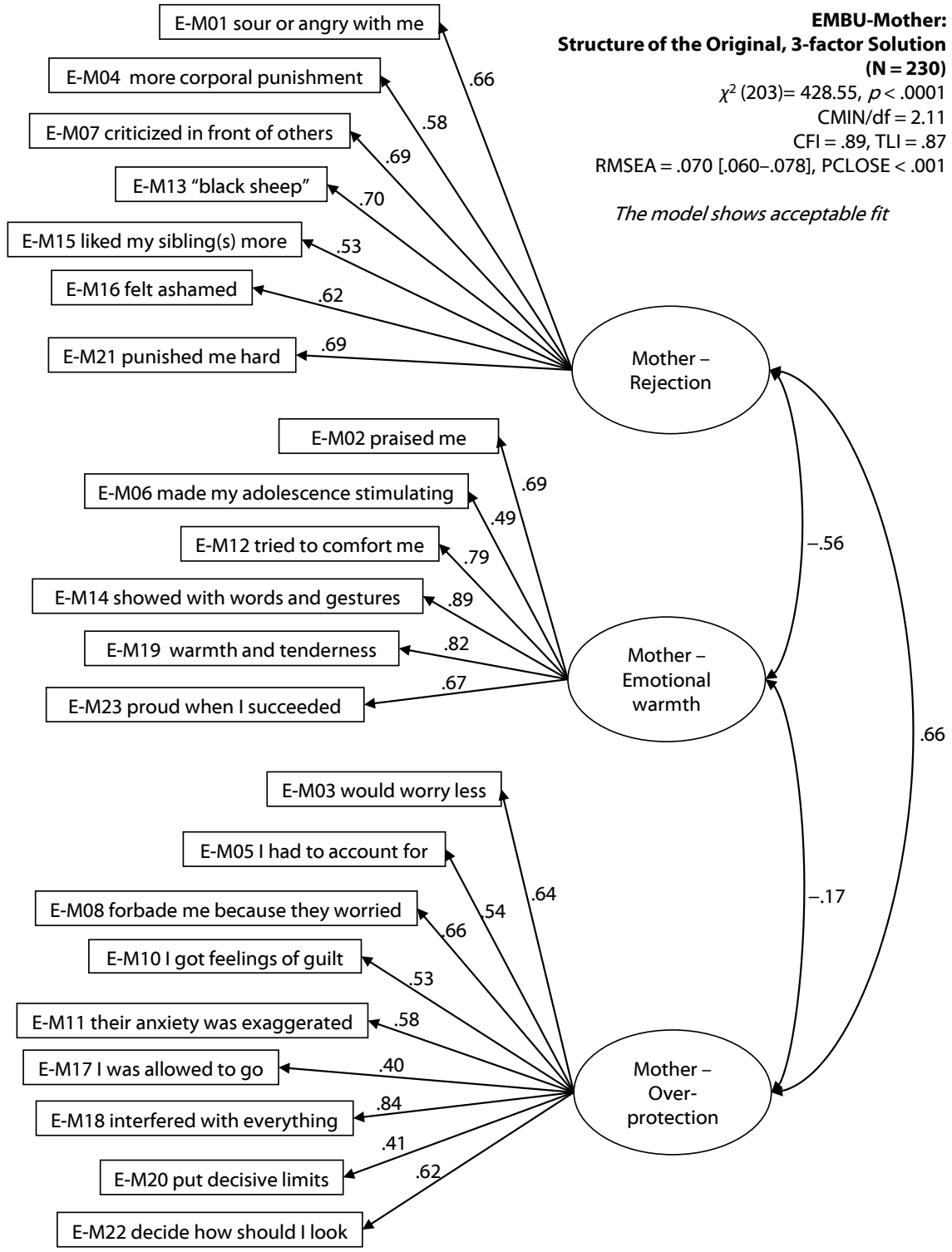


Figure 7 | Factor structure for the EMBU-Mother questionnaire.
Note. All coefficients are significant ($p < .001$).

Table 9 | Model fit indices of different factor solutions for the EMBU-Father ($N=230$)

Model	χ^2 (df)	CMIN/df	CFI	TLI	RMSEA	CI (RMSEA)	PCLOSE	AIC	$\Delta\chi^2$ (Δdf)
<i>Reference values</i>	<i>ns.</i>	$<2 (<5)$	$\geq .90$	$\geq .90$	$\leq .05$	$\leq .05$	<i>ns.</i>	<i>Lowest</i>	
EMBU-Father 1 factor	1198.72* (209)	5.73	.50	.45	.144	.136– .152	< .001	1330.7 2	
EMBU-Father 3 factors (no modification)	517.09* (206)	2.51	.84	.82	.081	.072– .090	< .001	655.09	675.62* (3) ^a
EMBU-Father 3 factors (minor modification)	428.55* (203)	2.11	.89	.87	.070	.060– .079	< .001	572.55	82.54* (3) ^b

Note. ^aAs compared to the 1-factor solution. ^bAs compared to the not modified 3-factor solution. * $p < .0001$.

The table shows that the original 3-factor solution of the questionnaire, according to most indices, shows acceptable fit. The fit was increased to a small extent if three correlations between error terms were included.

Table 10 | Model fit indices of different factor solutions for the EMBU-Father ($N=230$)

Model	χ^2 (df)	CMIN/df	CFI	TLI	RMSEA	CI (RMSEA)	PCLOSE	AIC	$\Delta\chi^2$ (Δdf)
<i>Reference values</i>	<i>ns.</i>	$<2 (<5)$	$\geq .90$	$\geq .90$	$\leq .05$	$\leq .05$	<i>ns.</i>	<i>Lowest</i>	
EMBU-Mother 1 factor	1156.32* (209)	5.53	.54	.49	.141	.133– .149	< .001	1244.3 2	
EMBU-Mother 3 factors (no modification)	520.43* (206)	2.53	.85	.83	.082	.073– .090	< .001	858.43	385.89* (3) ^a
EMBU-Mother 3 factors (minor modification)	456.97* (204)	2.24	.88	.86	.074	.065– .083	< .001	598.97	63.46* (2) ^b

Note. ^aAs compared to the 1-factor solution. ^bAs compared to the not modified 3-factor solution. * $p < .0001$.

The table shows that the original 3-factor solution of the questionnaire, according to most indices, shows acceptable fit. The fit was increased to a small extent if three correlations between error terms were included.

Table 8 shows that in general, there are no remarkable differences between the present sample and that assessed in a previous investigation. Both sample consisted of students and mainly young adults of different professions. In the present sample, Ss reported significantly less rejective, overprotective and punishing mothers and parents than in the previous study, however, effect sizes indicate weak effect, except for the difference in mothers' overprotective behavior that shows medium difference. Reliability indices are also favorable, and comparable to earlier findings.

It has to be considered, however, that the participants in the 2008 study were younger ($M = 23.93$, $SD = 4.69$, $N = 196$) than those in the present study (for those who filled in the EMBU for mother, $M = 28.33$, $SD = 9.66$, $N = 243$): $t(437) = -5.84$, $p < .001$, $r_{ES} = .27$, power = .98.

From **Tables 9 and 10** we can infer that the original 3 factor solution shows acceptable model fit. Although the relative model fit indices (CFI, TLI and RMSEA) do not reach the reference values, this may be the result of the non-normal distribution of the data. In general, these findings support the reliability and the validity of the EMBU. Permitting some correlations between error terms of items in the same factors slightly increase goodness-of-fit. To test whether the relationship of EMBU subscales follow a same pattern of intercorrelation, the linear correlations within the questionnaire—as filled in regarding the fathers and the mothers—were compared to those reported in [Arrindell et al. \(1999\)](#). As you can read from **Table 11**, the intercorrelations in the present sample are very similar to the values in the Hungarian standard—reported by Arrindell and his colleagues—, which gives further support to the validity of the EMBU. Those who responded to questions for both parents gave highly corresponding answers on the paternal and maternal rearing

styles (for Rejection, $r = .59$; for Emotional Warmth, $r = .68$; for Overprotection, $r = .57$, all of them significant at $p < .001$).

Similarly to a Spanish study with 832 adolescents (Aluja, del Barrio, & García, 2005), ratings of the female and male Ss regarding their parents' behavior were rather similar ($-2.08 \leq t \leq -0.02$, p not significant after Holm-Bonferroni correction).

Table 11 | Intercorrelation of EMBU subscales in the Hungarian standard, reported in Arrindell et al. (1999) and in the present sample

	Arrindell et al. (1999) ($N = 406$)			Present sample ($N_{father} = 230, N_{mother} = 246$)		
	R	EW	OP	R	EW	OP
EMBU-Father						
R	1			1		
EW	-.42*	1		-.43*	1	
OP	.40*	.02	1	.36*	.05	1
EMBU-Mother						
R	1			1		
EW	-.56*	1		-.49*	1	
OP	.38*	.12	1	.42*	.06	1

Note. R = Rejection, EW = Emotional Warmth, OP = Overprotection. * $p < .001$ (adjusted for Holm-Bonferroni criteria).

Correlation between EMBU subscales in the present study show a very similar pattern to the original Hungarian intercorrelation matrix.

As I noted in the review of EMBU, it does not provide information that may be relevant in the assessment of parental rearing style. These are 1) whether the child was raised by her/his biological parents, in an intact family, or whether someone else was her/his primary caretaker; 2) independently of the behavior of the parent, how much the respondent loved or loves her/his parents at the time of responding. To address these questions, I developed some additional items which were administered in the online questionnaire besides the original 23 items. Since many Ss made side notes on the paper-and-pencil questionnaire about the family structure or the caretakers previously, these questions preceded the original items. Questions on how much love s/he felt or feels now towards the parents were administered after the original items. **Table 12** shows that most of the Ss were raised in an intact family over their entire childhood. **Table 13** indicates that the majority of them were brought up by their biological parents.

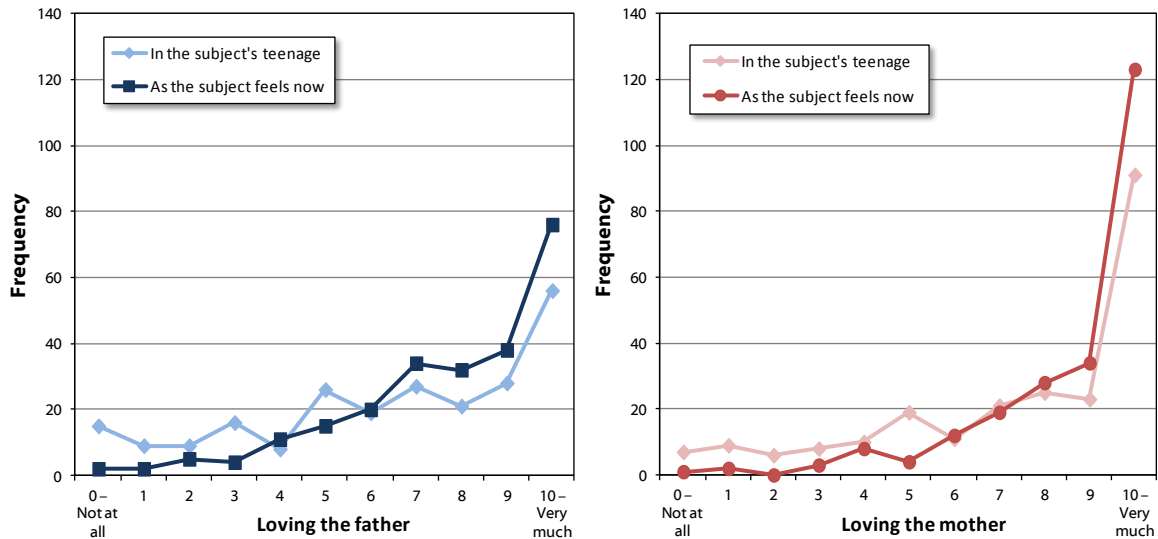
Table 12 | Stability of family structure

Stability	Freq.	%
Same caretakers over entire childhood	208	84.6
Same caretakers over the larger part of childhood	19	7.7
Changing caretakers in childhood	19	7.7
Total	246	100.0

Table 13 | Primary caretaker(s)

Caretaker(s)	Freq.	%
Biological parents	215	87.4
Biological mother	19	7.7
A biological parent and life partner	8	3.3
Other person(s)	4	1.6
Total	246	100.0

The love the Ss felt towards their parents as teenagers / at the time of responding to the questionnaire (irrespective of the parent alive or not) was indicated in a Likert scale, for both parents separately, where 0 meant no love at all, while 10 meant very much love. **Figure 8a** shows the distribution of scores for father (light blue line: as the S felt as a teenager / dark blue line: as the S felt at the time of administration), while **Figure 8b** indicates the distribution of love for mother (light red line: as a teenager / dark red line: at time of administration). Instead of separate columns, for the sake of better comparability, the scores are depicted as connected dots.



Figures 8a,b | Loving the parents when the respondent was a teenager (light line) and at the time of filling in EMBU (dark line) ($N_{\text{father}} = 230$, $N_{\text{mother}} = 246$). **The figures show that the majority of the Ss expressed much love for both parents; however, the scores on loving the parents now are somewhat more favorable than those Ss felt for the parents in their teenage age.**

As you can see in **Figures 8a and 8b**, the vast majority of the Ss reported that they had rather loved their parents both when they were teenagers and recently when they responded to the questionnaire. It is interesting to note that the evaluations for both parents, but for the fathers in particular, became more skewed to the right, i.e. more subjects reported that they loved their parents more now than when they were teenagers. Although there is a high correspondence between loving the two parents either in the Ss' teenage years ($r = .72$) or now ($r = .63$), they were not so unequivocal in the judgments they made for their adolescence and currently (for mothers, $r = .41$; for fathers, $r = .43$, for all four correlations, $p < .001$). In other words, Ss' love ratings toward their parents are similar, but the degree of love for one parent shows less consistency over time. This finding raised the possibility that as the Ss grow older, they may feel more love toward their parents. The extent of correlations between love ratings and age, however, did not support this notion ($-.083 \leq r \leq -.020$; $.758 \leq p \leq .205$). No significant differences were found in the ratings of parental behavior between psychologists and non-psychologists; or across professions in detailed breakdown ($0.18 \leq F \leq 2.11$, $.07 \leq p \leq .87$); or any which would reach medium effect size (over $r_{ES} = .30$).

6.2. Reading the Mind in the Eyes Test (RMET)

Given that the RMET is unidimensional, no factor analysis was needed to test its structural validity. The RMET mean scores were contrasted to means reported in the original (Baron-Cohen et al., 2001) and the Hungarian (Ivady et al., 2007) versions. As **Table 14** shows, the values are quite similar. No statistically significant difference was found between the means in the current study and those published in the standards.

Table 14 | Mean scores of Reading the Mind in the Eyes Test in the present study, and in the English (Baron-Cohen et al., 2001) and Hungarian (Ivady et al., 2007) standards

	<i>N</i>	<i>M</i>	<i>SD</i>	<i>CI(min)</i>	<i>CI(max)</i>
Present study	360	26.09	3.08	25.77	26.41
English standard (general population)	122	26.20	3.60	25.55	26.84
English standard (students)	103	28.00	3.50	27.31	28.68
Hungarian version	74	26.64	3.70	25.78	27.49

RMET scores in the present study are very similar to those obtained in the English and Hungarian reference samples.

The distribution of the scores is comparable to the original (Figure 9), and seems to converge to normality, although being leptokurtic (the majority of the Ss are close to the average). RMET scores show a significant, albeit small negative correlation with age ($r = -.13$, $p = .013$, power = .59). Females ($M = 25.52$, $SD = 2.96$) performed better on RMET than males ($M = 26.50$, $SD = 3.11$), although the effect is small: $t(358) = -3.009$, $p = .003$, $d = -0.32$, $r_{ES} = .16$, power = 84.

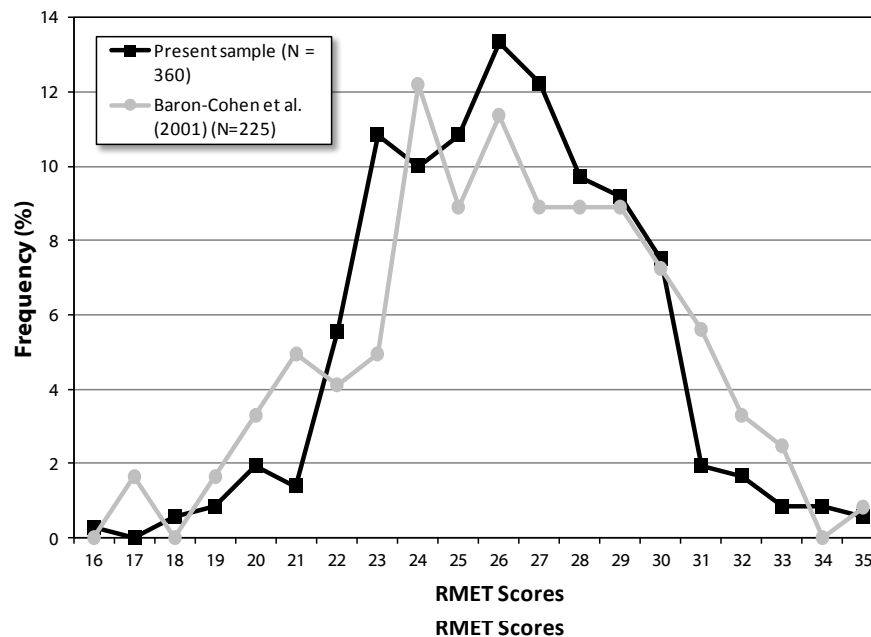


Figure 9 | Distribution of the Reading the Mind in the Eyes Test scores in the original English version and in the present study

Psychologists ($n = 59$, $M = 26.59$, $SD = 3.09$) did not perform better on RMET than non-psychologists ($n = 270$, $M = 25.91$, $SD = 3.10$): $t(327) = 1.54$, $p = .13$, $d = .17$, $r_{ES} = .08$, power = .32. In a more detailed breakdown, across professions, no difference was detected, either: $F(5, 323) = 0.92$, $p = .47$, $\omega = .03$, power = .42.

6.3. Emotional Contagion Scale (ECS)

In the original version of the ECS (Hatfield et al., 1994; Doherty, 1997), initially, the Ss had to mark their agreement with the items on a 4 point Likert scale. Later, the authors suggested a 5-point scoring, and this scoring was used in following studies (e.g. Lundqvist, 2006; Cardeña et al., 2009). Given that I adhered to the 4-point scoring—and that Doherty (1997) did not publish mean scores for the subscales—it was not possible to make comparisons with the standard or other large-sample

studies. **Table 15** summarizes the scores and reliability indices for ECS Total scores and Positive and Negative subscales.

There is a debate in emotional contagion research whether it is meaningful to categorize (contagious) emotions into a “positive” and “negative” cluster. While these can be further divided to “love” and “happiness” (under positive main factor) and “fear”, “anger”, and “sadness” (under negative main factor) second-order subscales, items on love is hard to fit into the circumplex model of affect, although confirmatory factor analyses support the justification of both the two- and the five-factor solution of the scale (Lundqvist, 2006). I conducted CFA to test whether the present data fit these models. Results of CFA are depicted in **Figure 10** and—in comparison with Lundqvist (2006)’s results—in **Table 16**.

Table 15 | Mean scores and reliability indices of Emotional Contagion Scale in the original version (Doherty, 1997) and in the present study

	No. of items	Doherty (N= 226) Cr-alpha	Present sample (N= 362)						
			M	SD	CI(min)	CI(max)	Cr-alpha	Skew	Kurt
ECS Total	15	.90	1.84	0.40	1.79	1.88	.78	-0.23	-0.25
ECS Positive	6	.82	2.25	0.46	2.20	2.98	.73	-0.73	-0.34
ECS Negative	9	.80	1.57	0.52	1.51	1.62	.78	-0.11	-0.48

The table shows that ECS scores in the present sample show somewhat lower but still good reliability (according to the Cronbach alpha values) as those in the reference sample.

No gender difference was detected in ECS Positive subscale: male ($n = 153$, $M = 2.22$, $SD = 0.46$) and female subjects ($n = 209$, $M = 1.27$, $SD = .46$) scored similarly [$t(360) = -1.44$, $p = .15$]. Women showed higher negative ($M = 1.78$, $SD = 0.46$) emotional contagion than men ($M = 1.27$, $SD = 0.47$): $t(360) = -10.21$, $p < .001$, $d = -1.07$, $r_{ES} = .47$, power $> .99$. Such a difference was also observed in ECS total scores (for males, $M = 1.65$, $SD = 0.38$; for females, $M = 1.97$, $SD = 0.36$): $t(360) = -8.44$, $p < .001$, $d = -0.88$, $r_{ES} = .41$, power $> .99$. The latter two show large effect size.

Emotional Contagion Scale:
Structure of the Original, 2-factor Solution
 (N = 362)
 $\chi^2 = 231.347$, $df = 86$, $p < .0001$
 CMIN/df = 2.690
 CFI = .881
 TLI = .855
 RMSEA = .068 [.058-.079]

The model shows acceptable fit

Emotional Contagion Scale:
Structure of the 5+2 Factor Solution
 (N = 362)
 $\chi^2 = 211.736$, $df = 84$, $p < .0001$
 CMIN/df = 2.521
 CFI = .896
 TLI = .870
 RMSEA = .065 [.054-.076]

The model shows acceptable fit

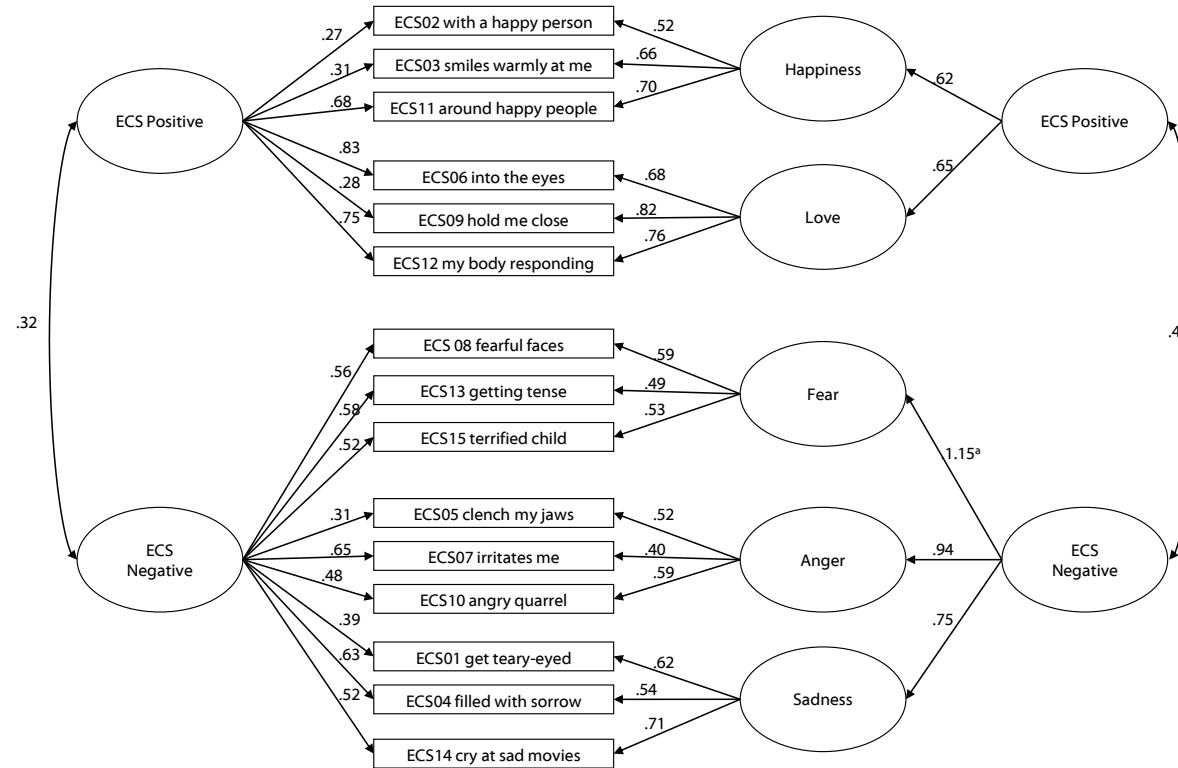


Figure 10 | Factor structure for the Emotional Contagion Scale, 2-factor solution (left) and 2+5 second-order factor solution (right).
Note. All coefficients are significant ($p < .001$). *The coefficient larger than 1 indicates a Heywood case (explanation in the text).

Table 16 | Model fit indices of different factor solutions for the Emotional Contagion Scale ($N = 362$)

Model	χ^2 (df)	CMIN/df	CFI	TLI	RMSEA	CI (RMSEA A)	PCLOSE	AIC	$\Delta\chi^2$ (Δdf)
<i>Reference values</i>	<i>ns.</i>	< 2 (< 5)	$\geq .90$	$\geq .90$	$\leq .05$	$\leq .05$	<i>ns.</i>	<i>Small-est</i>	
1 factor	266.71* (85)	3.14	.85	.82	.077	.067–.087	$< .001$	366.71	
2 factors	231.35* (86)	2.69	.88	.86	.068	.058–.079	$< .001$	329.35	35.36* (1) ^a
5 factors	255.93* (84)	3.05	.86	.83	.075	.065–.086	$< .001$	357.93	10.78* (1) ^a
2+5 factors in Lundquist (2006), $N = 665$	103.9 (83), <i>ns.</i>	1.25	.98		.027	.000–.047			
2+5 factors	211.74* (84)	2.52	.90	.87	.065	.054–.076	$< .001$	313.74	19.61* (2) ^b

Note.^aAs compared to the 1-factor solution. ^bAs compared to the not modified 3-factor solution. * $p < .0001$.

The table shows that the original 3-factor solution of the questionnaire, according to most indices, shows acceptable fit. The fit was increased to a small extent if three correlations between error terms were included.

While both the two first-order factors and the two and five second-order factors solution of ECS show acceptable fit, it has to be noted that in the latter structure, Fear (as a second-order factor) loads on ECS Negative main factor with a value larger than 1.0. This is the so-called Heywood case, indicating that between these latent variables a negative error variance was present. Negative error variances are usually caused by multicollinearity (an overlap between the two factors). It may be so if items constituting the “Fear” subscale are associated more strongly with the Negative ECS main factor than the items of “Anger” and “Sadness”. Another reason may be that although the factors show relatively small skewness and kurtosis (see the last two columns of **Table 15**), scores on the individual items may not be distributed normally. As I mentioned before, non-normal distributions are additively compromising validity of CFA. Although a Heywood case, in such circumstances, is admissible (Brown, 2015), it may indicate that the 5-factor solution—in spite of the favorable model fit indices—is problematic. Therefore, for the further analyses, the less detailed two-factor solution will be used. Propensity for emotional contagion was not associated with age ($r < .07$, $p > .19$).

Among those who provided information about their professions, psychologists ($n = 59$) were no more susceptible to positive emotional contagion than non-psychologists ($n = 272$) (Mann-Whitney $U = 7307.5$, $p = .278$, $d = .12$, $r_{ES} = -.06$, power = .21). Psychologists were more prone to negative emotional contagion ($U = 5849.0$, $p = .001$, $d = .36$, $r_{ES} = .17$, power = .78) and in general, to experience the contagion ($U = 6044.5$, $p = .003$, $d = .33$, $r_{ES} = .16$, power = .72).

6.4. Toronto Alexithymia Scale (TAS-20)

The TAS-20, according to the literature, is the most scrutinized measure applied in the present study. It has Hungarian norms, including measures of factorial validity, which makes it possible to compare mean scores and model fit to the values published by Cserjési et al. (2007). The descriptive statistics are summarized in **Table 17**. You can see in the table that the Ss in the present study reported significantly greater difficulties in identifying their feelings and significantly less pragmatic thinking than in the Hungarian standard. The subjects generally scored higher on the TAS-20 than in the standard. No difference was found in Difficulty in describing feelings. It has to be considered, however, that while our sample consisted mainly of adults (age $M = 27.85$, $SD = 9.61$) of various professions, in the standardization study the respondents were students (age $M = 22.59$, $SD = 3.0$)²² studying medicine, economics, or liberal arts.

²² An approximation calculated from data of female and male subsamples.

Table 17 | Mean scores and internal consistency of TAS-20 scale and subscales in [Cserjési et al. \(2007\)](#) and the present sample

(Sub)scale	No of items	Cserjési et al. (2007) (N= 275)			Present sample (N= 298)					Difference ^a					
		M	SD	Cr-alpha	M	SD	CI (min)	CI (max)	Cr-alpha	t	df	sig.	d	rEs	power
Difficulty in Identifying Feelings	8	11.91	3.94	.74	18.65	5.48	18.02	19.27	.78	-16.99	571	< .001	-1.42	.58	< .999
Difficulty in Describing Feelings	5	11.92	3.93	.76	11.87	3.92	11.42	12.31	.77	0.152	571	.561	0.013	.01	.05
Pragmatic Thinking	7	18.85	4.13	.57	14.26	3.74	13.83	14.68	.58	13.96	571	< .001	1.168	.50	< .999
TAS Total score	20	42.68	7.42	.77	44.78	9.77	43.66	45.89	.81	-2.88	571	.002	-0.241	.12	.82

Note.^aAll comparisons were carried out with assuming equal variances; for unequal variances the same pattern was found. **In the present sample, respondents reported significantly more difficulties in identifying emotions and significantly less pragmatic thinking than in the Hungarian normative sample. The effects are large. In general, the present Ss, according to their TAS-20 scores, are more alexithymic than those in the standard. The difference is of small effect.**

Table 18 | Intercorrelation of TAS-20 subscales in the Hungarian standard, in the present sample, and in the studies of [Cserjési et al. \(2007\)](#) and [Bagby et al. \(2014\)](#)

	Cserjési et al. (2007), paper-and-pencil (N= 275)				Present sample, Internet-based (N= 298)				Bagby et al. (2013), paper-and-pencil (N= 321)				Bagby et al. (2013), Internet-based (N= 300)			
	DIF	DDF	PRT	TOT	DIF	DDF	PRT	TOT	DIF	DDF	PRT	TOT	DIF	DDF	PRT	TOT
Difficulty in Identifying Feelings (DIF)	1				1				1				1			
Difficulty in Describing Feelings (DDF)	.02 <i>ns.</i>	1			.53**	1			.77*	1			.72*	1		
Pragmatic Thinking (PRT)	-.02 <i>ns.</i>	.22**	1		.06 <i>ns.</i>	.37**	1		.19*	.30*	1		.12 <i>ns.</i>	.49*	1	
TAS Total score (TOT) ^a	.52**	.66**	.66**	1	.80**	.84**	.57**	1	—	—	—	1	—	—	—	1

Note.^aBagby and his colleagues do not report correlations between the subscales and the total score.* $p < .01$.** $p < .001$. **The table shows that there are differences in the TAS intercorrelation of Difficulty in Identifying and Describing Feelings subscales between the Hungarian standard and present study. The present correlation is rather similar to those found either in the paper- or the Web-based subsamples in the study of Bagby et al. (2013).**

The difference in the age between the students in the standardization study and the Ss of the present study is significant: $t(571) = -8.69, p < .0001, d = -0.73, r_{ES} = .34, \text{power} > .99$. As Cserjési et al. (2007) noted, the intercultural comparison is distorted by the fact that in some countries the standardization was carried out with adults, while elsewhere with students. The difference in the scores between their study and mine, however, has a small effect size. Age itself did not show strong association with alexithymia scores ($-.095 \leq r \leq .015, .103 \leq p \leq .796$).

I checked whether the factor intercorrelations are comparable to the original. As you can see in Table 18, in the study of Cserjési et al. (2007) Difficulty in Identifying Feelings (DIF) and Difficulty in Describing Feelings (DDF) factors showed no association, while in the present study they showed a strong correlation ($r = .53, p < .001$). The intercorrelations of other factors and the factor-total correlations followed the same pattern in the two studies, although they were generally higher in the current sample. This drove me to contrast the intercorrelations to those obtained in Bagby et al. (2014). This study is also relevant for comparison, because the authors administered TAS-20 to two groups, in a paper-and-pencil test versus via an online surface. Contrasting their results to ours may give an answer to Research Question 7 (whether online data are comparable with paper-pencil testing). Between DIF and DDF, even a higher correlation ($r < .7$) was yielded for both conditions than in the current web-based administration. For DIF–PRT correlation, our result was rather similar to the Internet-based correlation, while for DDF–PRT it was similar to the paper-and-pencil test.

The results of confirmatory factor analysis (Figure 10 and Table 19) supported the structure suggested by Cserjési and her colleagues, deviating from the original Canadian version in just one item (Item 20, instead of Pragmatic Thinking, it is loading on Difficulty in Identifying Feelings).

Table 19 | Model fit indices of different factor solutions for the Toronto Alexithymia Scale ($N = 298$)

Model	χ^2 (df)	CMIN/df	CFI	TLI	RMSEA	CI (RMSEA)	PCLOSE	AIC	$\Delta\chi^2$ (Δ df)
<i>Reference values</i>	<i>ns.</i>	$<2 (<5)$	$\geq .90$	$\geq .90$	$\leq .05$	$\leq .05$	<i>ns.</i>	<i>Lowest</i>	
1 factor	634.95* (170)	3.73	.69	.65	.096	.088–.104	$< .001$	754.96	
3 factors in Cserjési et al. (2007), $N = 275$	339.41* (167)	2.03	.84		.060	.050–.070			
3 factors	402.63* (167)	2.41	.84	.82	.069	.060–.080	$< .001$	528.63	232.32* (3) ^a

Note. ^aAs compared to the 1-factor solution. * $p < .0001$.

The table shows that the 3-factor solution shows acceptable fit.

Based on the respective TAS-20 subscale scores, for psychologists ($n = 50, M = 17.18, SD = 5.01$), it seems to be less difficult to identify their feelings than for non-psychologists ($n = 244, M = 12.25, SD = 3.96$): $t(292) = -2.07, p = .04$, although the effect is rather small: $d = -0.24, r_{ES} = .12, \text{power} = .45$. Psychologists seem to be able to describe their emotions ($M = 10.06, SD = 3.29$) better—having a lower score in TAS-20— than non-psychologists ($M = 12.25, SD = 3.95$), $t(292) = -3.67, p < .001$, with a medium-sized effect: $d = -0.42, r_{ES} = .21, \text{power} = .85$. No significant professional difference was observed in Pragmatic Thinking: $t(229) = -1.93, p = .054$ (effect size is also small, $r_{ES} = .11$). In general, psychologists scored lower on TAS-20 ($M = 40.62, SD = 9.03$) than non-psychologists, but the latter group’s mean was also well below the cut-off score of 52 which would have indicated the presence of sub-clinical alexithymia ($M = 45.68, SD = 9.69$). The difference is significant: $t(292) = -3.40, p = .001$, and has a medium effect size: $d = -0.40, r_{ES} = .20, \text{power} = .82$. (Comparisons were carried out with Student t tests).

When analyzing differences in TAS-20 scores across professions in a more detailed breakdown, a significant effect was found for all three subscales and the total score. Table 20 summarizes these findings.

Table 20 | Comparison of Toronto Alexithymia Scale subscale and total scores across professions with analysis of variance

TAS-20 (sub)scales	<i>F</i> (df ₁ = 5, df ₂ = 288)	<i>p</i>	ω	power	significant <i>post hoc</i> Hochberg's GT2 tests ^a
Difficulty in Identifying Feelings	2.75	.020	.17	.88	Psy <i>versus</i> Other (<i>p</i> = .012)
Difficulty in Describing Feelings	3.63	.003	.21	.70	Psy <i>versus</i> IT (<i>p</i> = .013) Psy <i>versus</i> Other (<i>p</i> = .007)
Pragmatic Thinking	4.21	.001	.23	.97	Psy <i>versus</i> IT (<i>p</i> = .001) Culture <i>versus</i> IT (<i>p</i> = .012) Other <i>versus</i> IT (<i>p</i> = .024)
Total score	3.50	.004	.20	.95	Psy <i>versus</i> IT (<i>p</i> = .006) Psy <i>versus</i> Other (<i>p</i> = .013)

Note.^aThe first group had the more favorable mean score (indicating lower alexithymia). Psy = psychologists and psychology students; IT = Information Technology and engineering professionals, Culture = Culture and Science professionals, Other = Subjects retired, unemployed or without categorized professions.

The table shows that ANOVA revealed significant differences in alexithymia scores across professions. In general, psychologists showed the lowest, while IT professionals and not further categorized Ss the highest alexithymia.

As you can read from **Table 20**, the effect of the subjects' profession can be seen in greater detail. The effect is significant for all three TAS-20 subscales and the total score, with effect sizes close to medium magnitude. In general, psychologists and professionals working in the field of culture or science seemed to be less alexithymic, while professionals of Information Technology / engineering and those who belonged to the "Other" category (also including retired or unemployed subjects) showed the highest scores. These findings warn that different professions may be associated with different levels of alexithymia, which may be considered in future research projects. It may also partly explain the large difference observed in the alexithymia scores between the present sample and those subjects assessed in the standardization study for Hungarian TAS-20.

**Toronto Alexithymia Scale:
Structure of the 3-factor Solution identified by
Cserjési, Lénárd & Luminet (2007)**

(N = 298)

$\chi^2 = 402.63$, $df = 167$, $p < .0001$

CMIN/df = 2.41

CFI = .84

TLI = .82

RMSEA = .069 [.060-.080], PCLOSE < .001

The model shows acceptable fit

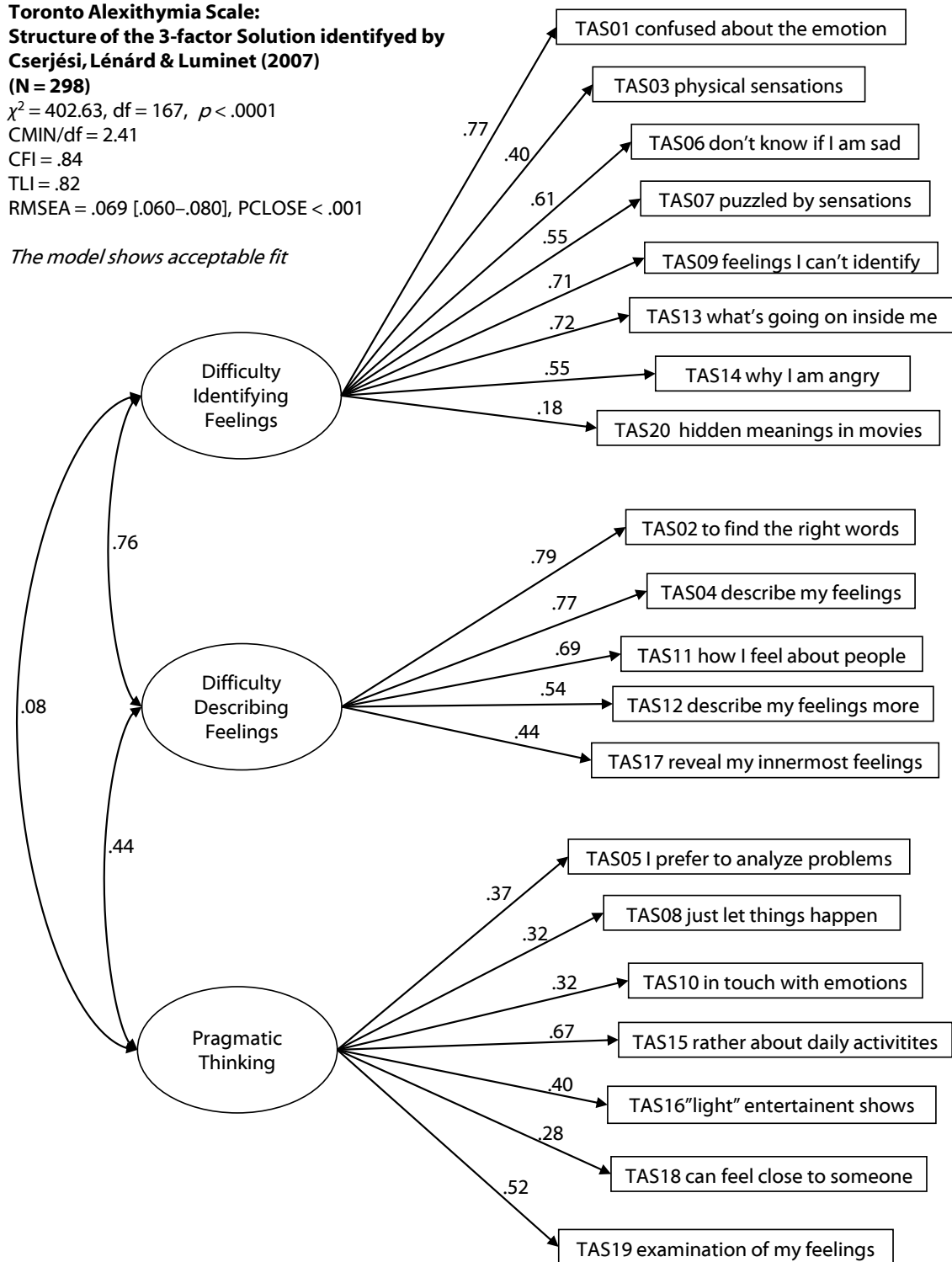


Figure 11 | Factor structure for the Toronto Alexithymia Scale.
Note. All coefficients are significant ($p < .001$).

Based on earlier findings that males are more prone to alexithymia than females, I checked gender differences across TAS-20 factor and total scores. As you can see in **Figure 12**, females score higher on the *Difficulty in Identifying Feelings* subscale (with a medium effect size), no gender difference was observed in *Difficulty in Describing Feelings* and *Pragmatic Thinking* subscales (although males scored somewhat higher), and in general, males got higher score on the TAS total (with small-medium effect).

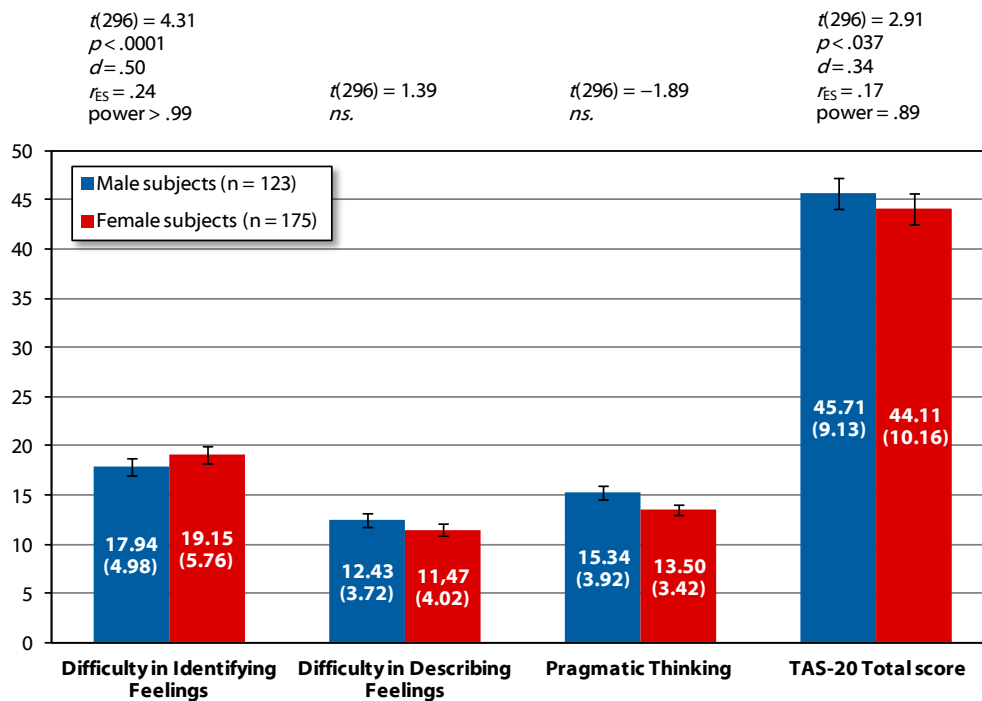


Figure 12 | Mean scores (and in parentheses, standard deviations) of male and female subjects on TAS-20 subscales and total. *Note.* Error bars indicate 95% confidence interval. Above the bars, statistical comparisons across genders are listed.

As I outlined in Section 5.4.3 on the TAS, people can be categorized along the level or severity of their alexithymia. We can differentiate between those who can easily access their emotions (“lexithymics”), who have trouble with it (“sub-alexithymics”) and those whose ability to access and elaborate emotions is severely damaged or decreased (“alexithymics”) (Taylor et al., 1997). It was calculated how much Ss from each gender fell into the “lexithymic” (TAS-20 total score < 51), “sub-alexithymic” (TAS-20 total score between 52–60), and “alexithymic” (TAS-20 total over 60). Their distribution is presented in **Table 21**.

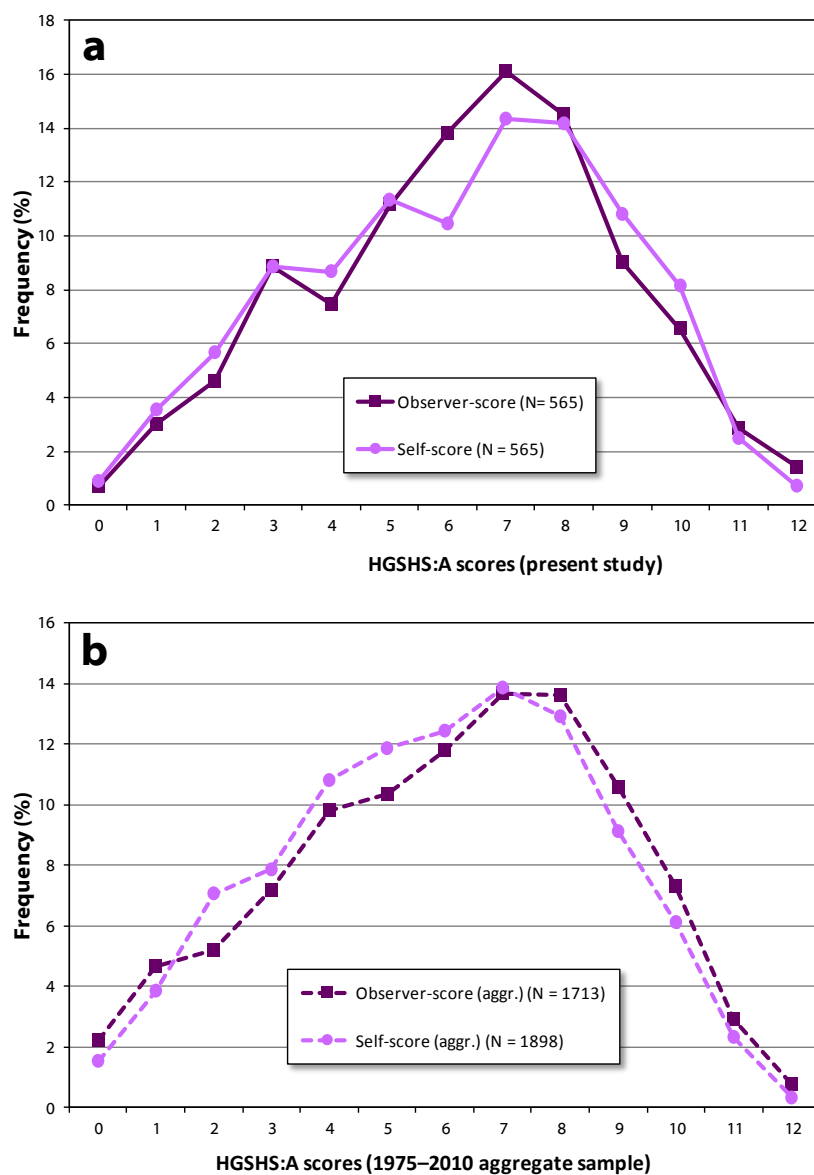
Table 21 | Proportion of lexithymic, sub-alexithymic, and alexithymic subjects

	Lexithymic	Sub-alexithymic	Alexithymic
Male n (Male %)	82 (66.7%)	37 (30.1%)	4 (3.3%)
Female n (Female %)	132 (75.4%)	28 (16.0%)	15 (8.6%)
Total N (Total %)	214 (71.8%)	65 (21.8%)	19 (6.4%)

The proportions in the cells are significantly different: $\chi^2(2) = 10.54, p = .005, \text{power} = .95$. Almost twice as many men belong to the sub-alexithymic range as women; there were, in contrast, more than twice female Ss in the alexithymic category than males. The imbalanced proportions suggest that comparisons based upon alexithymia ranges shall be treated with caution.

6.5. Harvard Group Scale of Hypnotic Susceptibility (HGSHS:A)

As the HGSHS:A is used routinely in our lab since the 1970s, many aggregated data are at hand to make comparisons (Költő, Gösi-Greguss, et al., 2014). Indeed, the Hungarian standard was published within the frames of the present research (Költő et al., 2015). For a longitudinal analysis—to check whether mean hypnotizability scores changed between 1975 and 2010—all HGSHS:A data obtained during this 35-year period was collected. First, mean hypnotizability scores in the present data was compared to that in the above mentioned aggregated sample. As **Table 22** shows, although hypnotizability in this sample is significantly higher than in the aggregated sample, the effect sizes show that the difference has a rather small magnitude. A very similar pattern was found when the aggregate sample was compared to the HGSHS:A standard. In **Figures 13a** and **13b**, you can see the distribution of hypnotizability scores in the present sample (**Figure 13a**, solid lines) and in the aggregate study (**Figure 13b**, broken lines). For the sake of comparability, percentage of those Ss who achieved the respective score, are illustrated with squares (for observer-scores) and rounds (self-scores) instead of separate columns.



Figures 13a-b | Distribution of HGSHS:A scores in the present sample (a) and in the aggregate sample, hypnotized between 1975–2010 (b).

The figures show that distribution of HGSHS:A observer- and self-scores converge towards a normal curve.

Table 22 | Mean scores and internal consistency of HGSHS:A Total score in [Költő, Gósi-Greguss, et al. \(2014\)](#) (aggregated data obtained between 1975–2010) and in the present sample

(Sub)scale	No. of items	Költő et al. (2014) ($N_{obs} = 1713$, $N_{self} = 1898$)			Present sample ($N = 565$)					Difference ^a					
		<i>M</i>	<i>SD</i>	Cr-alpha	<i>M</i>	<i>SD</i>	CI (min)	CI (max)	Cr-alpha	<i>t</i>	df	sig.	<i>d</i>	<i>r</i> _{ES}	power
HGSHS:A Observer-scores	12	5.59	2.83	.72	6.31	2.59	6.09	6.52	.68	-5.35	2276	< .001	-0.22	.11	> .99
HGSHS:A Self-scores	12	5.91	2.65	.66	6.23	2.68	6.01	6.46	.68	-2.51	2461	.012	-0.10	.05	.67

Note. ^aAll comparisons (Student *t* tests) were carried out with assuming equal variances; for unequal variances the same pattern was found.

In the present sample, hypnotizability scores (both according to self-scoring and observers' registration) are higher than in the sample aggregated in 1975–2010. The effect size, however, is small for observer-scores and negligible for self-scores.

As you can see in **Figures 13a-b**, despite the small difference in the means, the current data show very similar curves to those in the original. For the current observer-scores, skewness = -0.17 , kurtosis = -0.51 ; for self-scores, skewness = -0.22 , kurtosis = -0.76 . Similar data for the aggregate sample are the following: skewness = -0.26 , kurtosis = -0.68 (observer-scores), and skewness = -0.141 , kurtosis = -0.75 (self-scores). These values indicate that distributions of the scores are not excessively skewed and they are mesocurtic, i.e. are converging towards normality. This finding contradicts that of Hilgard (1965), who concluded from early observations with the HGSHS:A that hypnotizability follows a bimodal distribution.

Although it is not impossible to conduct CFA on categorical (including binary) variables, the traditional way—using the covariance matrix to calculate maximum likelihood ratios—cannot be used because it may lead to serious errors (like incorrect test statistics). [Brown \(2015\)](#) suggests using the so-called Robust Weighted Least Squares estimation instead. Unfortunately, this opportunity is not available in AMOS 20. Therefore for the HGSHS:A, I conducted exploratory factor analysis instead of CFA. Such a factor analysis was conducted for the aggregated sample ([Költő et al., 2013](#)). Its most important finding was that although the total scale shows relatively good reliability (as indicated by the Cronbach alpha values), the subscales seemed to be less reliable. One of the criticisms against HGSHS:A is that it is not balanced well between the motor and the cognitive-perceptual aspects of hypnotizability; that is the rationale behind the recommendation of using HGSHS:A and SHSS:C in combination ([Perry et al., 1992](#); [Woody & Barnier, 2008](#)). Indeed, while HGSHS:A contains 5 items tapping into direct motor phenomena and 4 suggestions that represent the motor-challenge domain, it has only 3 suggestions covering the cognitive-perceptual dimension: the fly hallucination, the posthypnotic ankle touch and amnesia (see **Table 5**). From these, both the fly hallucination and the posthypnotic suggestion contain a motor element (shoo the imaginary fly away, and bend down to touch the ankle). No wonder, therefore, that these items also load on the motor components of the scale. We can expect, however, that an exploratory factor analysis will justify the existence of the direct motor, the motor challenge, and the cognitive-perceptual factors.

For both scoring systems,²³ following the traditions and conventional criteria of exploratory factor analysis ([A. Field, 2009](#)), a principal component analysis was conducted on the 12 self-scored and 12 observer-scored suggestions, with orthogonal (Varimax) rotation. According to the Kaiser-Meyer-Olkin (KMO) index of sampling adequacy and Bartlett's sphericity test, both the observer-scores and the self-scores of HGSHS:A proved to be eligible for exploratory factor analysis. For observer-scores, KMO = $.84$, Bartlett's $\chi^2(66) = 2727.16$, $p < .001$. For self-scores, KMO = $.82$, Bartlett's $\chi^2(66) = 2445.2$, $p < .001$. In both cases, three components had eigenvalues larger than 1. These three components explained 45.6% of the variance in the observer-scores and 43.5% of the variance in self-scores. Visual analysis of the scree plots also supported the existence of 3 factors for both scoring systems. **Table 23** shows the factor loadings in the rotated component matrix of the observer-scores; that of self-scores are in **Table 24** (factor loadings under $.25$ are suppressed).

If you compare **Tables 23** and **24** with **Table 5**, you can notice that there is a large correspondence between the hypothetical and the observed factor structure of HGSHS:A. For both scoring systems, Suggestions 4, 5, 6, 8, and 10 constitute the first component, which is identical to the Motor Challenge subscale of HGSHS:A. Suggestions 1, 2, 3, and 7 belong to the Direct Motor subscale. Suggestions 9, 11, and 12—although the suggestions for Fly Hallucination (9) and the Posthypnotic Ankle Touch (11) bear a motor component—form the third subscale which we may label “Perceptual-Cognitive”. In Observer-scores, however, some motor challenge items also load with weight $> .25$ to the direct motor subscale, and according to both scoring criteria, Posthypnotic Amnesia also have a loading on the Motor Challenge factor. This indicates that factor's reliability shall be scrutinized. Cronbach alpha values were also calculated for the aggregate study. In **Table 25**, they are compared with the current sample.

²³ It is important to note that the observers apparently do not calculate a separate score for the Amnesia suggestion, as it is derived from the number of the other suggestions the S recalled before cancelling posthypnotic amnesia. Therefore this is the only score in which HGSHS:A self- and observer-scoring is identical.

If we compare the factor loadings with the factor belonging of each suggestions in **Table 5**, we can conclude that the factor analysis largely support the original structure. In the observer-scores, however, some items have large loadings on both motor components. This may indicate that the direct motor and the motor challenge components are not fully distinct from each other. As you can see in **Table 25**, the total scale shows acceptable (although not too high) internal consistency. The direct motor suggestions also fall into that range. The motor challenge and the cognitive-perceptual items, however, are not scored consistently. These observations suggest that the factors should not be used for detailed analyses, just the mean scores.

Table 23 | Rotated component matrix for HGSHS:A observer-scores ($N= 565$)

Item No.	Component		
	1	2	3
6. Arm Rigidity	.708	.259	
4. Arm Immobilization	.693		
8. Communication Inh.	.657		
5. Finger Lock	.555	.276	
10. Eye Catalepsy	.533	.444	
7. Hands Moving		.683	
3. Hand Lowering		.665	
1. Head Falling		.627	
2. Eye Closure		.539	
11. Posthypn. Action			.726
9. Fly Hallucination		.292	.577
12. Posthypn. Amnesia	.374		.496

Table 24 | Rotated component matrix for HGSHS:A self-scores ($N= 565$)

Item No.	Component		
	1	2	3
6. Arm Rigidity	.712		
4. Arm Immobilization	.692		
10. Eye Catalepsy	.677		
5. Finger Lock	.677		
8. Communication Inh.	.672		
3. Hand Lowering		.657	
1. Head Falling		.588	
7. Hands Moving		.567	
2. Eye Closure		.552	
11. Posthypn. Action			.723
9. Fly Hallucination			.665
12. Posthypn. Amnesia	.297		.394

Note. Inh. = Inhibition, Posthypn. = Posthypnotic. **The tables show that both HGSHS:A observer- and self-scores yielded a factor structure similar to earlier findings. Component 1 consists of Motor Challenge suggestions; Component 2 contains Direct Motor Suggestions, while Component 3 consists of Perceptual-Cognitive Suggestions and Amnesia.**

Table 25 | Cronbach alpha values for the aggregate HGSHS:A sample and for the present sample

	Költő et al. (2014)		Present sample	
	Obs-score (N = 1713)	Self-score (N = 1898)	Obs-score (N = 565)	Self-score (N = 565)
HGSHS:A (12 items)	.72	.66	.68	.68
Direct Motor (4 items)	.74	.71	.68	.75
Motor Challenge (5 items)	.66	.59	.53	.43
Cognitive-Perceptual (3 items)	.24	.23	.25	.29

The table shows that while the total scale and the direct motor subscale show acceptable reliability, the Motor Challenge and the Cognitive-Perceptual subscales show rather small internal consistency.

Given that not only university students, but older generations were also represented in the sample, it was possible to investigate whether age and hypnotizability are associated. Age showed a significant, albeit not too large correlation with HGSHS:A observer-scores ($r = .13, p = .002$), but not with self-scores ($r = -.08, ns.$). When comparing our data, categorized for age groups, in accordance with the observation of [Page and Green \(2007\)](#), there was a general decrease in hypnotic susceptibility over age, although in the age group of middle-aged adults (between 41 and 50) the mean scores are not unequivocal. Still, as you can see in **Figure 14**, the age group of university

students shows the highest hypnotizability score in both the American and the Hungarian sample. For the age distribution in the sample, refer back to **Table 2**.

Comparison of the means across the age groups (with ANOVA), however, did not bring significant differences. For self-scores, $F(1, 7) = 0.53, p = .81, \omega < .01, \text{power} = .23$. According to Hochberg's GT2 tests²⁴ for *post hoc* comparisons, no difference was found between the hypnotizability of the age groups ($.30 \leq p \leq .89$). For observer-scores, $F(1,7) = 1.80, p = .08, \omega = .04, \text{power} = .73$. Hochberg's GT2 tests yielded no difference across age groups ($.13 \leq p \leq .99$).

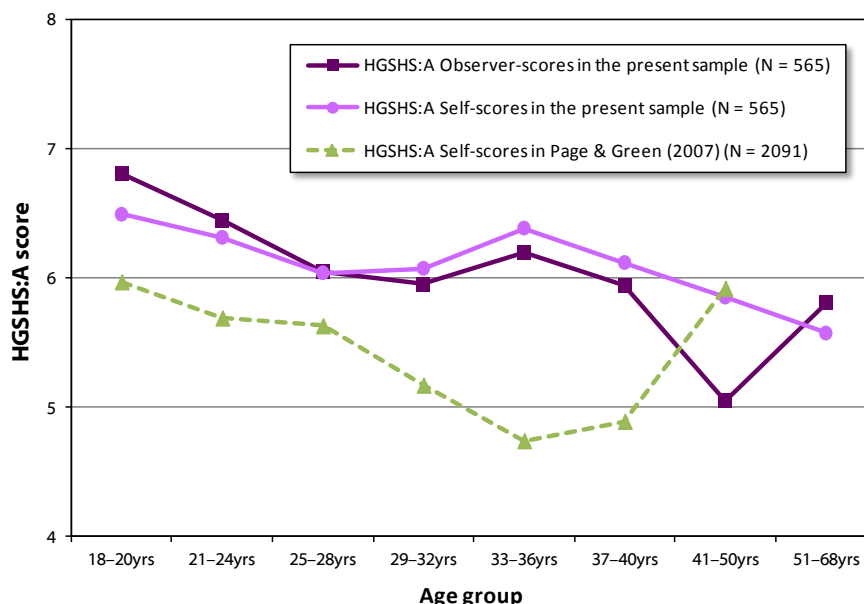


Figure 14 | Hypnotizability scores across age groups in the present sample (solid purple lines) and in [Page and Green \(2007\)](#) (broken green line). *Note.* The dark purple line shows HGSHS:A observer-scores, while the light purple line shows HGSHS:A self-scores. In Page & Green's study, the self-scoring criterion was applied.

The figure demonstrates that there seems to be a general decrease in hypnotic susceptibility over age.

Previous observations collected since the 1960s in many different countries are ambiguous on gender differences in hypnotizability. In some of the national standards of HGSHS:A and in three large-sample studies ([Rudski, Marra, & Graham, 2004](#); [Page & Green, 2007](#); [Költő, Gősi-Greguss, et al., 2014](#)), female Ss were significantly more hypnotizable than males. The difference had, however, small effect size in all studies. **Figure 15** shows the gender differences observed in the present study. As you can see in the figure, current findings replicate and support the notion that women, assessed with HGSHS:A, seem to be slightly more hypnotizable than men, but the effect is rather small, and the difference is significant only for observer-scores.

²⁴ When variance across the compared groups is homogenous, but group sizes are different, Hochberg's GT2 test shall be used for *post hoc* comparison ([A. Field, 2009](#)).

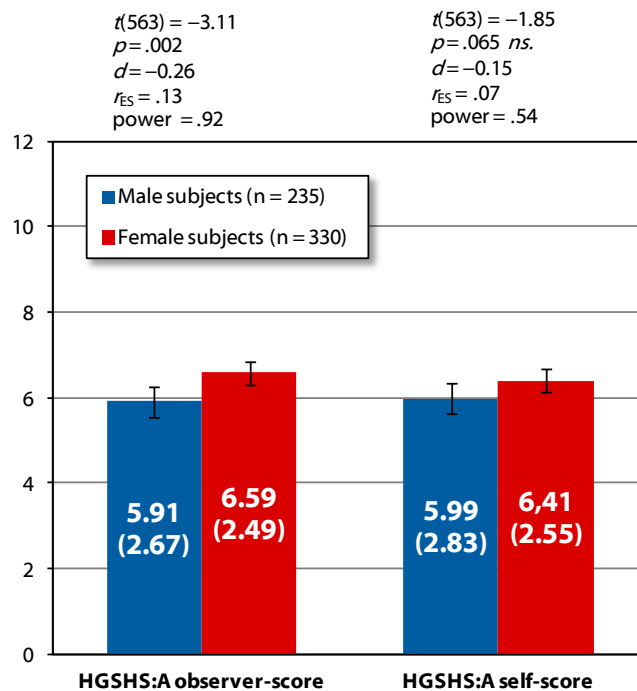


Figure 15 | HGSHS:A Mean scores (and in parentheses, standard deviations) of male and female subjects. *Note.* Error bars indicate 95% confidence interval. Above the bars, statistical comparisons (t tests) across genders are indicated.

Let's take a look on hypnotizability of the Ss from different professions. **Figure 16** depicts the HGSHS:A observer- and self-scores in a breakdown by what you saw in **Table 3**. Differences in hypnotizability scores are not remarkable across professions (ANOVA), neither for observer-scores [$F(5, 453) = 2.184, p = .06, \omega = .11, \text{power} = .39$], nor for self-scores [$F(5, 453) = 1.04, p = .39, \omega = .02, \text{power} = .06$]. Although the difference is not significant, we can see in the figure that observers rated the hypnotizability of psychologists and healthcare professionals the highest, and that of the legal and administrative professionals the lowest (the difference is more than 1 point). A similar but not so much polarized deviation can be seen in self-scores. When psychologists and psychology students (without healthcare workers) were compared to Ss with all other professions with Student t tests, they proved to be significantly more susceptible to hypnosis according to their observer-scores [$t(457) = 3.75, p < .001, d = 0.35, r_{ES} = .17, \text{power} = .95$] as well as self-scores [$t(457) = 2.138, p = .03, d = 0.20, r_{ES} = .09, \text{power} = .59$]. These results suggest that the effect of profession (psychology vs. non-psychology) must be taken into consideration in further investigations.

As I mentioned it in Section 2.1 on hypnotizability, people can be classified upon their hypnotizability scores into three groups, termed “low hypnotizables” (LH), “mediums” (MH) and “highs” (HH). In HGSHS:A, the scores ranging between 0 and 4 indicate low, 5 to 7 show medium, while scores between 8–12 express high hypnotizability. Even more stringent categories can be used to separate very low (scores 0–2) and very high (scores 11–12) hypnotizable subjects ([E. R. Hilgard, 1965](#); [Register & Kihlstrom, 1986](#)). **Tables 26** and **27** are crosstabulations showing the proportion of LH, MH and HH subjects in gender breakdown (for HGSHS:A observer- and self-scores, respectively).

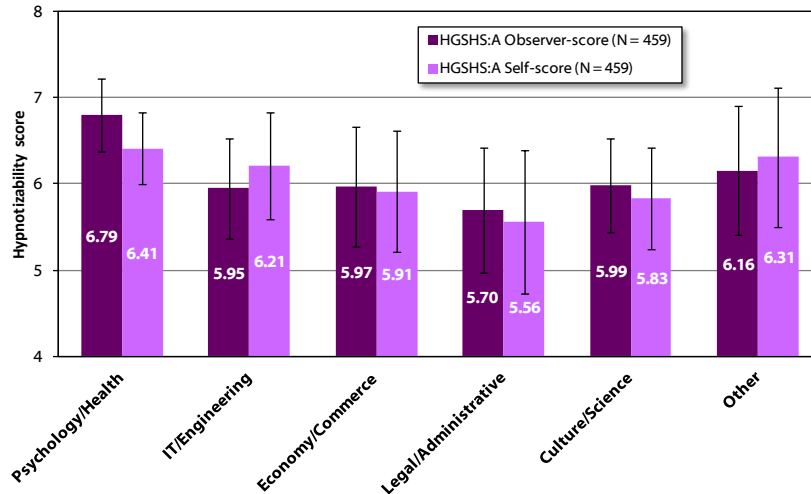


Figure 16 | HGSHS:A Mean scores across the Ss' professions.
Note. Error bars indicate 95% confidence interval.

Table 26 | Proportion of low, medium and high hypnotizable subjects, according to their HGSHS:A observer-scores

	Lows (score 0–4)	Mediums (score 5–7)	Highs (score 8–12)
Male <i>n</i> (Male %)	75 (31.9%)	144 (61.3%)	16 (6.8%)
Female <i>n</i> (Female %)	64 (19.4%)	221 (67.0%)	45 (13.6%)
Total <i>N</i> (Total %)	139 (24.6%)	365 (64.6%)	61 (10.8%)

Table 27 | Proportion of low, medium and high hypnotizable subjects, according to their HGSHS:A self-scores

	Lows (score 0–4)	Mediums (score 5–7)	Highs (score 8–12)
Male <i>n</i> (Male %)	77 (32.8%)	133 (56.6%)	25 (10.6%)
Female <i>n</i> (Female %)	79 (23.9%)	212 (64.2%)	39 (11.8%)
Total <i>N</i> (Total %)	156 (27.6%)	345 (61.1%)	64 (11.3%)

In both scoring systems, according to chi-square tests, Ss fell unevenly into hypnotizability ranges, although the difference is significant only for the observer-scoring. For HGSHS:A observer-scores, $\chi^2(2) = 15.36, p < .001$. For self-scores, $\chi^2(2) = 5.36, p = .07$. If we compare the two tables we can see that the proportions of male and female Ss belonging to each categories are very similar in the two scoring system. Roughly, 30%, 60%, and 10% of the men are low, medium, and HH, respectively; these proportions for women are around 20%, 65% and 15%, respectively, giving support to the notion that the majority of the people (around two-thirds) are somewhat susceptible to hypnosis, while the other one-third fall into either to the low or into the HH range. It is a question, however, whether someone falls into the same category across the two scoring methods. In **Table 28**, the cross-tabulation shows how LH, MH and HH subjects are classified upon self- versus observer-scoring.

Table 28 | Proportion of low, medium and high hypnotizable subjects (“Lows”, “Mediums”, and “Highs”, respectively) across observer- versus self-scoring of HGSHS:A

		HGSHS:A observer-scoring		
		Lows (score 0–4)	Mediums (score 5–7)	Highs (score 8–12)
HGSHS:A self-scoring	Lows (score 0–4)	105	51	0
	Mediums (score 5–7)	34	285	26
	Highs (score 8–12)	0	29	35

In the present sample, the correlation between HGSHS:A observer-scores and self-scores is high ($r = .82, p < .001, \text{power} > .99$), which is in line with earlier findings (e.g., [Bentler & Hilgard, 1963](#); [Varga, Farkas, et al., 2012](#); [Költő et al., 2015](#)). Still, as you can see in **Table 28**, the two scoring systems are not totally congruent. There were no subjects who scored themselves to be low or high, while their observers would classify them into the opposite category. Still, about one third (32.7%) of LHs by self-scoring were (over)rated as MHs by the observers, 17.4% of MHs by self-scoring were scored either LHs (9.9%) or HHs (7.5%) by the observers, and 45.3% of the HHs by self-scoring were (under)rated as MHs by the observers. Conversely, 24.5% of the LHs by observer-scoring scored themselves as MHs, 21.9% of MHs by observer-scoring scored themselves as either LHs (14.0%) or HS (7.9%), and 42.6% of the HH by observer-scoring scored themselves as MHs. Imbalanced classification is supported by the chi-square test: $\chi^2(4) = 341.91, p < .001$. The extent of agreement between the observers and the subject on the subject’s hypnotizability level, Cohen’s kappa = .528 ($p < .001$), suggesting that the two scoring systems lead to discrepant results. These values are very similar to those found by [Varga, Farkas, et al. \(2012\)](#) [$N = 1887, r(\text{observer-self}) = .81, \text{Cohen’s kappa} = .563$]. The discrepancy between self- and observer-scores does not mean that we should discard one method and just rely on the other. On the contrary, they should be used to corroborate each other and thus enhance the ecological validity of hypnosis research ([Költő & Bányai, 2015](#)).

Given that just a small portion of the total sample ($n = 191, 33.8\%$) both took part in the hypnotizability testing and responded to all online measures (I referred to them in **Table 4** as *core sample*), it is necessary to check whether their hypnotizability is comparable to the total sample. **Table 29** (next page) shows that although those in the core sample have somewhat lower hypnotizability scores than the total sample, the difference is marginal. This observation is in line with the differences across age groups, given that mean age in the total sample ($M = 26.11, SD = 8.41$) is significantly higher than in the core sample ($M = 28.53, SD = 9.89$), $t(754) = -3.28, p = .001, d = -0.24, r_{ES} = .12, \text{power} = .86$.

As outlined in Section 4.5 on possible experimenter effects, the personal variables of the hypnotists—including their gender, age, expertise and even hypnotizability—may contribute to the variation in the Ss’ hypnotic responses. This is **Research Question 8** of the present thesis. It seemed therefore important to include more hypnotists in the research, to assess these experimenter effects. Six hypnotic operators conducted the HGSHS:A sessions. Their characteristics are summarized in **Table 30**.

As you can see in the table, the hypnotists show a large variety in their age and hypnotic susceptibility, although they do not constitute the “large, representative” sample [Kihlstrom \(2008\)](#) proposed for the investigation of “hypnotist effects”. The six experimenters can be classified as members of the “young” (A.A. and B.B.), “middle-aged” (C.C. and D.D.), and “elderly” generations (E.E. and F.F.). Three of them are females (A.A., C.C. and E.E.), and three are males. Three of them (A.A., B.B. and D.D.) are highly hypnotizable, while C.C., E.E., and F.F. belong to the low susceptible group. Unfortunately, age and hypnotizability are imbalanced (HH hypnotists are younger than LHs), and as you can see, so is the distribution of the subjects hypnotized by each hypnotist.

Table 29 | Mean scores and internal consistency of HGSHS:A Total score the full sample and among those who responded to all online measures (“Core sample”)

	No of items	Total sample (N= 565)			Core sample (n= 191)					Difference ^a					
		<i>M</i>	<i>SD</i>	Cr-alpha	<i>M</i>	<i>SD</i>	CI (min)	CI (max)	Cr-alpha	<i>t</i>	df	sig.	<i>d</i>	<i>r</i> _{ES}	power
HGSHS:A Observer-scores	12	6.31	2.59	.68	5.88	2.60	5.31	6.05	.68	1.98	754	.05	0.14	.07	.51
HGSHS:A Self-scores	12	6.23	2.68	.68	5.72	2.79	5.32	6.12	.71	2.25	754	.02	0.16	.08	.60

Note. ^aAll comparisons (Student *t* tests) were carried out with assuming equal variances; for unequal variances the same pattern was found.

Hypnotizability scores of those in the core sample (both according to self-scoring and observer-scoring) are somewhat higher than in the total sample; however, the effect sizes indicate that the difference is of negligible effect.

Table 30 | Personal variables of the hypnotists participating in the research

Hypnotist					Number of Ss hypnotized
Fake initials	Gender	Age at first hypnosis	HGSHS:A observer-score	HGSHS:A self-score	
A.A.	Female	31.6	12	12	20
B.B.	Male	29.5	11	11	178
C.C.	Female	57.1	4 ^a		171
D.D.	Male	56.1	8	8	37
E.E.	Female	66.2	0 ^b		106
F.F.	Male	63.1	3	4	53

Note. ^aAssessed by SHSS:A. ^bAssessed by SHSS:B.

Still, it seems feasible to check whether there are differences in the hypnotic susceptibility of their Ss. **Figure 17** shows HGSHS:A observer- and self-scores across different hypnotists. As you can see, subjects of A.A. and E.E. show the highest, while those of B.B. the lowest hypnotic responsiveness. According to the results of ANOVA, in the entire sample, there is a significant hypnotist effect both on observer-scores [$F(5, 559) = 7.22, p < .001, \omega = .23, \text{power} > .99$] and self-scores [$F(5, 559) = 4.45, p = .001, \omega = .17, \text{power} = .91$], suggesting that the effect is small-medium sized. Hochberg's GT2 *post hoc* comparisons revealed that according to observer-scores, A.A.'s subjects were significantly more hypnotizable than B.B.'s; those hypnotized by E.E. were more susceptible (in both scoring system) than those of B.B. and C.C. Significance values are indicated by the horizontal braces in **Figure 17**. The pairwise comparisons revealed that these effects had small-medium effect sizes in observer / self-scores (A.A. versus B.B. $r_{ES} = .19 / .21$; B.B. versus E.E. $r_{ES} = .32 / .22$; C.C. versus E.E. $r_{ES} = .21 / .10$).

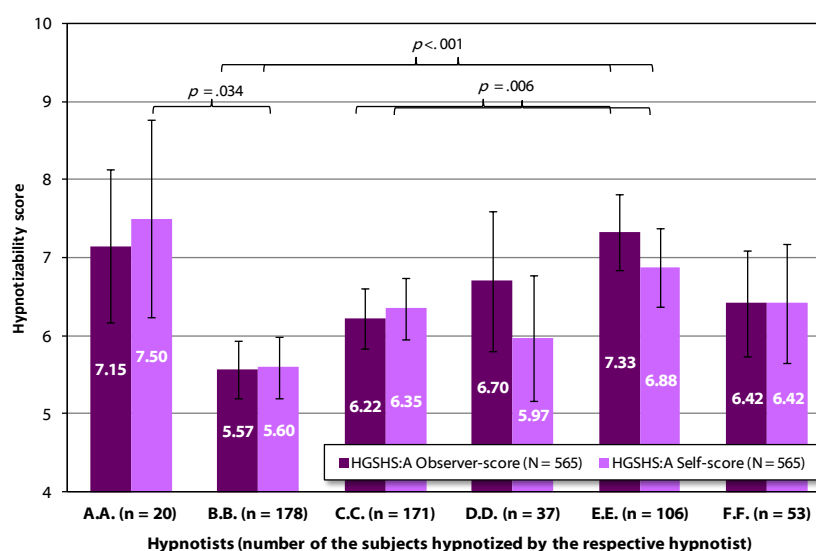


Figure 17 | HGSHS:A mean scores of the subjects hypnotized by different hypnotists (marked by fake initials on the horizontal axis) in the entire sample. Note. Error bars indicate 95% confidence interval.

Post hoc comparisons of hypnotic susceptibility scores (following ANOVA) showed that the Ss hypnotized by A.A. and E.E. were significantly more susceptible than those of B.B.; subjects hypnotized by E.E. were also more susceptible than those of C.C.

It has to be taken into consideration, however, that the hypnotists had different professional backgrounds and the distribution of Ss with different professions was uneven among them. E.E. is a

teacher and clinician who hypnotized many psychology students in the frame of her courses on hypnosis. A.A. is a clinician from the younger generation. B.B. is a younger hypnotist with some experience in clinical hypnosis with more practice in teaching and research. C.C. is a seasoned teacher and researcher in academic context, while D.D. is a clinician, both from the middle-aged generation. F.F. is an older hypnotherapist. All hypnotists hypnotized much less psychology students than E.E. That was the reason for me to check whether the same experimenter effect can be found in the core sample (the fraction of the sample which responded to all tests of parental rearing style and mentalization. **Figure 18** shows HGSHS:A scores across hypnotists in the core sample. As you can see, differences are smaller; but just as in the entire sample the Ss are distributed unevenly among the hypnotists. None of the Ss of A.A., and only 6 and 6 of the Ss of C.C. and E.E., respectively had responses on all measures, while 156 Ss hypnotized by B.B. filled in all non-hypnotic tests. Still, ANOVA shows that in the core sample, Ss do not show different hypnotizability across hypnotists: for observer-scores, $F(3, 187) = 0.594, p = .62, \omega = .08, \text{power} = .13$; neither for self-scores, $F(3, 187) = 0.405, p = .75, \omega = .09, \text{power} = .15$.

In sum, the mean comparisons, the explorative factor analysis, and the indices of internal consistency show that the HGSHS:A shows acceptable structural validity and reliability, but the scale scores should not be further divided into subscales. Similarly to a large-scale American study, the age groups covering the population of university students showed the highest hypnotizability, while older Ss were less susceptible. The core sample seems to represent the total sample for HGSHS:A scores. In the entire sample, a significant hypnotist effect was observed; in the core sample, the effect was not detectable. The differences in hypnotizability across hypnotists may be magnified (or caused) by the fact that many psychology students participated, who were hypnotized by their teacher(s). In the core sample, which included much less students, this effect may have not played a role.

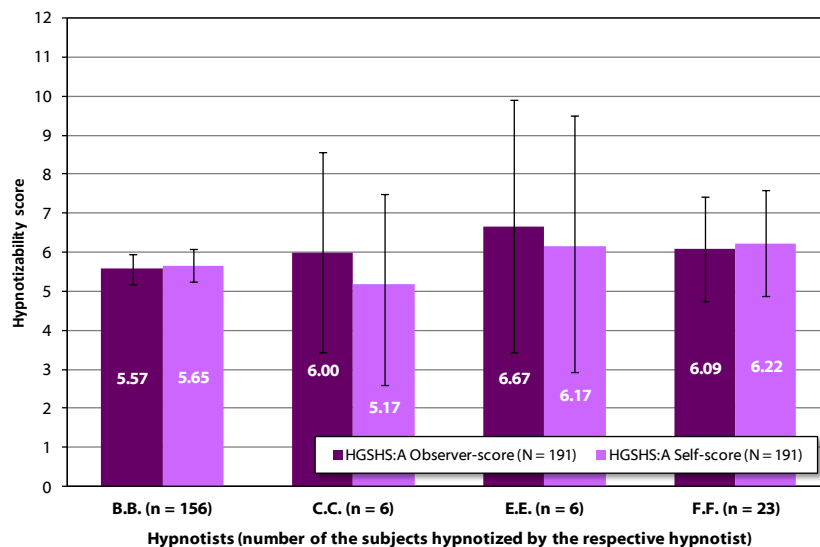


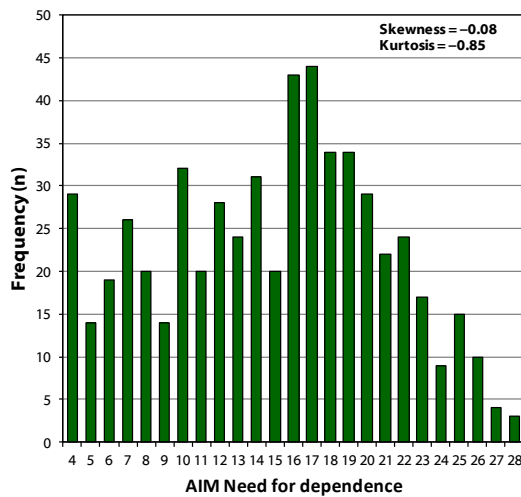
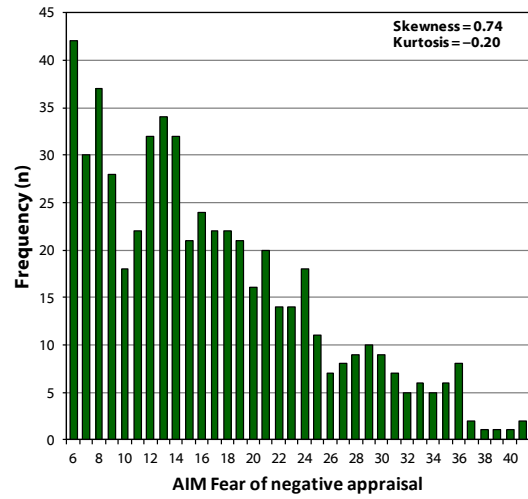
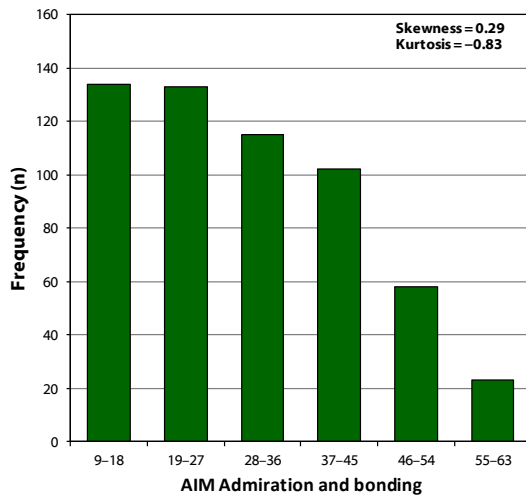
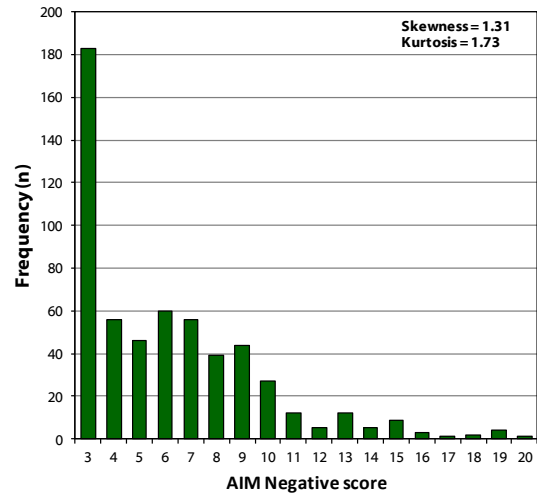
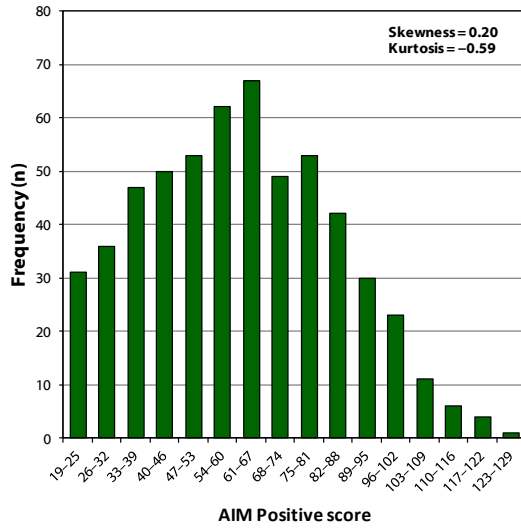
Figure 18 | HGSHS:A Mean scores of the subjects hypnotized by different hypnotists (marked by fake initials on the horizontal axis) in the core sample. *Note.* Error bars indicate 95% confidence interval. **In the core sample, no significant difference was observed in the hypnotic susceptibility of the Ss hypnotized by different hypnotists, as measured with ANOVA.**

6.6. Archaic Involvement Measure (AIM)

The Hungarian version of the AIM ([Bányai et al., 2001](#)) consists of 22 items (the 19 original items describe the positive, while 3 refer to the negative aspect of the relationship with the hypnotist). As mentioned in Section 5.5.2 on the psychometric properties of AIM, the Hungarian version proved to be quite similar to the original, although its factorial structure was somewhat different. The original subscales are: (1) *Perceived power of the hypnotist*, (2) *Positive emotional bond to the hypnotist*, and (3) *Fear of negative appraisal* [by the hypnotist]. Instead of these, in the Hungarian version, items were organized into (1) *Admiration and bonding to the hypnotist*; (2) *Fear of negative appraisal*; and (3) *Need for dependence* (e.g., “I wanted the hypnotist to take care of me while I am in hypnosis”). The sum of the positive items give a total score (AIM+), while the fourth (4), additional factor, consisting of the Negative items, form AIM-. Negative subscale is the sum of the three single item scores; the positive factors are averaged from the respective items, leading to a score between 1 and 7 for each factor.

Just like for measures of parental rearing, we can expect AIM raw scores *not* to follow normal distribution. Given the many pieces of evidence that the hypnotist, even in laboratory setting, may evoke archaic involvement that is similar to the emotional bond to the parents, AIM+ show a peak in higher scores (thus skewed to the left), while most subjects scoring low in AIM- and Fear of negative appraisal (skewed to the right). Distribution plots of AIM total scores and subscales (**Figures 19a-e**) support these expectations. Since the subscales contain different number of items, in the following, raw scores are divided with the number of the items in the respective subscale.

Table 31 shows the means for AIM+, AIM- and the three positive subscales in the present sample. The results were compared with another large-sample study, conducted by [Józsa \(2012\)](#). The differences between her and my results had marginal effect sizes. In the positive aspect of archaic involvement, no significant deviation was found between Ss in her and my study. Cronbach alpha values in the two studies also showed very similar values, suggesting that the AIM+ and the positive subscales show very high reliability (Cronbach alpha > .80), while the AIM- (probably due to the small number of the items) showed less favorable internal consistency. The 19 items of AIM+ showed practically the same level of reliability (.93) as in the original English version by [Nash and Spinler \(1989\)](#) (.94). If you look at **Figure 19b** (upper chart on the right), you will notice that AIM- scores converge to the floor, i.e., a large majority of the Ss give the smallest score, indicating that they did not express *any* negative emotions towards the hypnotist.



Figures 19a-e | Distribution of raw scores on AIM+, AIM- and AIM subscales

The histograms show that distribution of AIM Positive scores shows a rather balanced skew, while AIM Negative scores are strongly skewed to the right (with a peak at smallest score, thus demonstrating a floor effect). Admiration and bonding to the hypnotist and Fear of negative appraisal also show skewness to the right, while Need for dependence is evenly skewed.

Table 31 | Mean scores and internal consistency of AIM Positive, AIM Negative and AIM subscales in [Józsa \(2012\)](#) and the present sample

(Sub)scale	No of items	Józsa (2012) (<i>N</i> = 518)			Present sample (<i>N</i> = 565)					Difference ^a					
		<i>M</i>	<i>SD</i>	Cr-alpha ^a	<i>M</i>	<i>SD</i>	CI (min)	CI (max)	Cr-alpha	<i>t</i>	df	sig.	<i>d</i>	<i>r</i> _{ES}	power
AIM+	19	59.85	24.36	.94	61.29	23.09	59.39	63.20	.93	-0.99	1081	.318	-0.06	.03	.25
AIM-	3	5.74	3.38	.61	6.16	3.43	5.88	6.45	.66	-2.03	1081	.043	-0.12	.06	.62
Admiration and bonding to the hypnotist	9	3.25	1.52	.94	3.32	1.47	3.20	3.44	.94	-0.77	1081	.441	-0.05	.02	.21
Fear of negative appraisal	6	2.98	1.43	.87	2.77	1.37	2.65	2.88	.88	2.47	1081	.013	0.15	.07	.79
Need for dependence	4	3.57	1.56	.83	3.71	1.51	3.59	3.84	.81	-1.50	1081	.134	-0.09	.05	.43

Note. ^aComputed for a combined sample of Ss participating in individual or group hypnosis (*N*= 905). **In the present sample, respondents reported about significantly more negative feelings about the hypnotist and significantly less fear of that the hypnotist would negatively appraise them than in another large-sample study, but even these differences showed negligible effect sizes. No significant difference was found in positive archaic involvement, admiration and bonding towards the hypnotist, or need for depending on the hypnotist. For the comparisons, Student's *t* tests were used.**

Confirmatory factor analysis of the AIM scores of the entire sample confirmed the factor structure emerged in the investigation of [Bányai et al. \(2001\)](#). As you can see in **Table 32** and **Figure 20**, the 3 second-order (Admiration and Bonding; Fear of Negative Appraisal; Need for Dependence) and 2 first-order (Positive and Negative) factor solutions showed the best model fit, although CMIN/df index reached the desirable value between 2 and 5 just when correlations of items within the same second-order factor were permitted.

Table 32 | Model fit indices of different factor solutions for the Archaic Involvement Measure ($N=565$)

Model	χ^2 (df)	CMIN/df	CFI	TLI	RMSEA	CI (RMSEA)	PCL OSE	AIC	$\Delta\chi^2$ (Δ df)
<i>Reference values</i>	<i>ns.</i>	<2 (<5)	$\geq .90$	$\geq .90$	$\leq .05$	$\leq .05$	<i>ns.</i>	<i>Lowest</i>	
AIM (Positive + Negative)	1457.4 1* (199)	7.324	.836	.810	.106	.101–.111	< .001	1609.4 15	
AIM 4 factors	1175.5 4* (203)	5.791	.873	.856	.092	.087–.097	< .001	1275.5 43	
AIM 3+2 factors (no modification)	1286.0 2* (207)	6.213	.859	.843	.096	.091–.101	< .001	7948.8 08	
AIM 3+2 factors (minor modification)	921.36* (204)	4.516	.907	.894	.079	.074–.084	< .001	1019.3 59	364.65 7* (3) ^a

Note.^aAs compared to the unmodified 3+2 factor solution. * $p < .0001$.

The table shows that the 3+2 factor solution, permitting correlated error terms, shows acceptable fit.

It is also a question whether female and male Ss differ in the extent of positive and negative emotional bond to their hypnotists. Scores on AIM+, AIM–, and subscales in gender breakdown are listed in **Table 33**, alongside with comparisons. Mann-Whitney tests indicate that females in general expressed more positive and less negative feelings towards the hypnotists; they felt more admiration and bonding to and more dependence on the H than males, although these differences had rather small effect size. No gender difference was observed in the Ss' fear of the hypnotist evaluating them negatively (including that s/he would not like the subject or would be angry with the subject).

Archaic involvement showed no difference across the Ss' professions (ANOVA): $1.61 \leq F(5, 453) \leq 2.20$, $.053 \leq p \leq .156$. When psychologists were contrasted against non-psychologists (**Table 34**), all AIM scales but AIM– showed significant differences, indicating that psychologists expressed higher emotional involvement; the effects, however, were not larger than those observed across genders (not exceeding effect size r of .12).

A strong difference was found across the Ss of different hypnotists in the positive dimension of archaic involvement. You can see AIM scores (AIM+, AIM– and subscales) of the Ss across the Hs in **Figures 21a–e**. They evoked different levels of positive archaic involvement: $F(5, 559) = 9.87$, $p < .001$, $\omega = .27$, power $> .99$. *Post hoc* comparisons following ANOVA indicated by Hochberg's GT2 tests, demonstrated that the subjects of E.E. showed significantly more positive emotions towards her than subjects hypnotized by B.B., C.C., D.D. and F.F. to their hypnotists (**Figure 21a**). Different Hs did not evoke significantly different negative archaic involvement: $F(5, 559) = 2.01$, $p = .075$, $\omega = .09$, power $> .99$ (**Figure 21b**). Hypnotists evoked different levels of admiration and bonding: $F(5, 559) = 5.99$, $p < .001$, $\omega = .21$, power $> .99$. Hochberg's GT2 values showed that Ss felt significantly more admiration and bonding towards E.E. than they did towards B.B., C.C., or D.D. (**Figure 21c**). A similar effect was found for fear of negative appraisal: $F(5, 559) = 9.55$, $p < .001$, $\omega = .27$, power $> .99$. Again, Ss of E.E. expressed significantly more fear that she would feel negative about them than did the Ss of B.B., C.C., or D.D. (**Figure 21d**). The subjects also expressed different levels of need for dependence: $F(5, 559) = 6.59$, $p < .001$, $\omega = .22$, power $> .99$. *Post hoc* comparisons demonstrated that the subjects hypnotized by B.B., C.C. and F.F. expressed significantly less need for dependence than did the Ss of E.E. (**Figure 21e**). These effects in general have medium effect size.

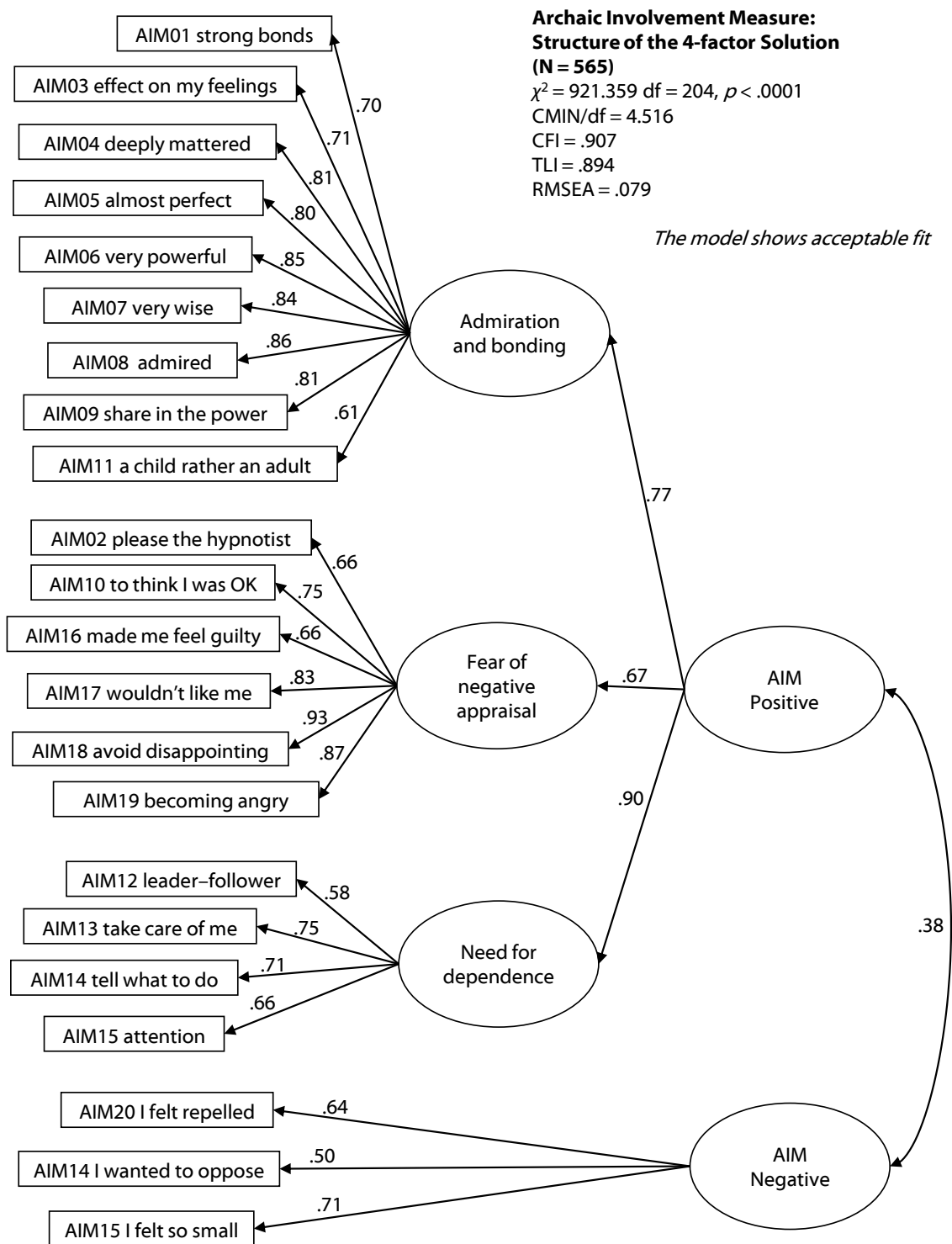
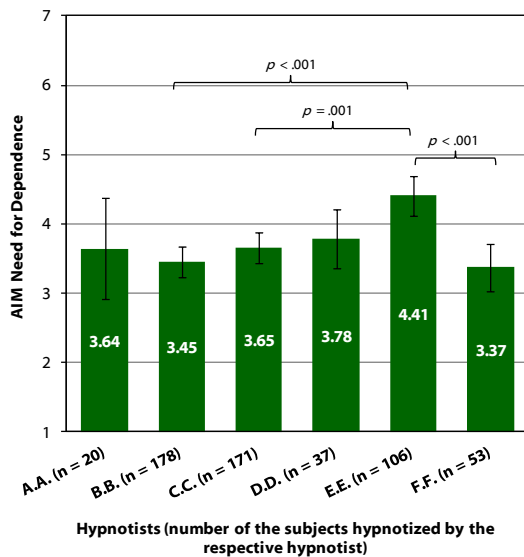
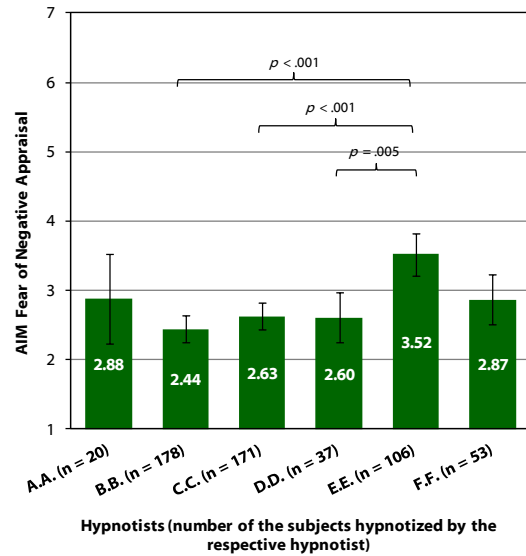
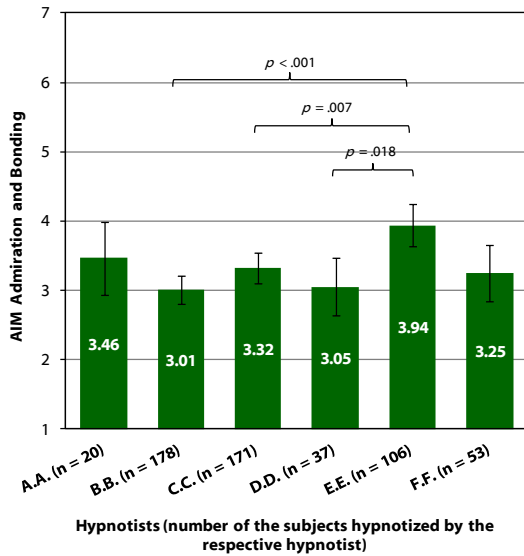
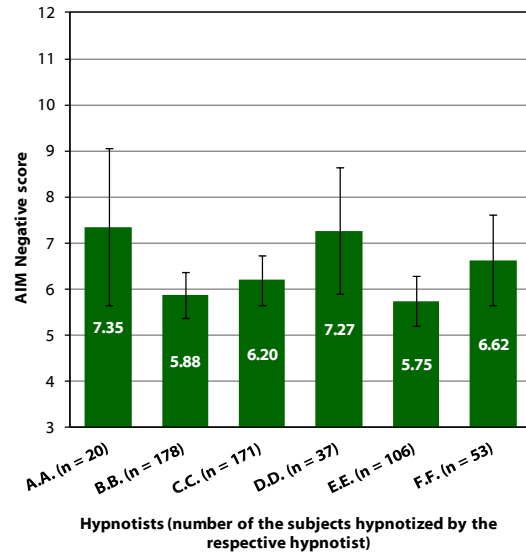
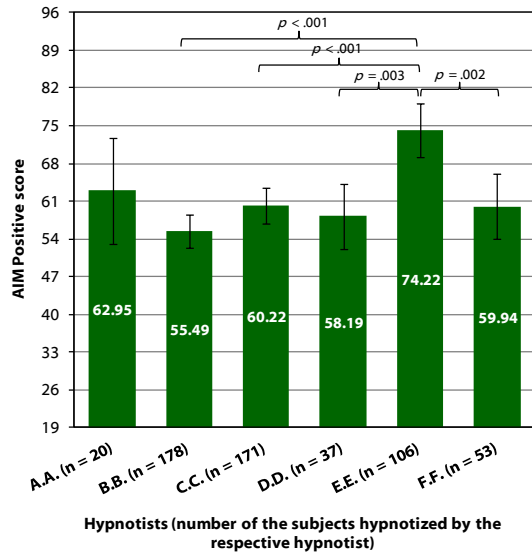


Figure 20 | Factor structure of the Archaic Involvement Measure.
Note. All coefficients are significant ($p < .001$).



Figures 21a-e | AIM Positive, Negative and AIM subscale scores across different hypnotists.
Note. Error bars indicate 95% confidence interval. Horizontal braces indicate significant Hochberg's GT2 comparisons between the respective hypnotists.

Table 33 | Gender differences in Archaic Involvement Measure Positive and Negative total scores and subscales (*N* = 565).

AIM (Sub)scale	Males (<i>n</i> = 235)					Females (<i>n</i> = 330)					Comparison					
	<i>M</i>	<i>SD</i>	<i>SE</i>	CI (min)	CI (max)	<i>M</i>	<i>SD</i>	<i>SE</i>	CI (min)	CI (max)	<i>U</i>	<i>z</i>	<i>p</i>	<i>d</i>	<i>r</i> _{ES}	power
AIM+	58.77	21.54	1.40	56.00	61.53	63.09	24.00	1.32	60.49	65.59	34,467	-2.25	.024	0.20	.10	.72
AIM-	6.63	3.73	0.24	6.15	7.11	5.83	3.17	0.17	5.49	6.18	34,130	-2.48	.013	0.23	.11	.83
Admiration and bonding to the hypnotist	3.12	1.35	0.09	2.94	3.29	3.46	1.53	0.08	3.29	3.62	33,729	-2.64	.008	0.24	.12	.87
Fear of negative appraisal	2.78	1.36	0.09	2.61	2.96	2.76	1.38	0.08	2.61	2.91	38,238	-0.28	.78	0.01	.01	.09
Need for dependence	3.51	1.43	0.09	3.33	3.69	3.85	1.55	0.09	3.69	4.02	33,561	-2.73	.006	0.23	.11	.84

Table 34 | Differences between psychologists and non-psychologists in Archaic Involvement Measure Positive and Negative total scores and subscales (*N* = 459).

AIM (Sub)scale	Psychologists (<i>n</i> = 121)					Non-Psychologists (<i>n</i> = 338)					Comparison					
	<i>M</i>	<i>SD</i>	<i>SE</i>	CI (min)	CI (max)	<i>M</i>	<i>SD</i>	<i>SE</i>	CI (min)	CI (max)	<i>U</i>	<i>z</i>	<i>p</i>	<i>d</i>	<i>r</i> _{ES}	power
AIM+	64.77	25.40	2.31	60.2	69.34	58.00	22.14	1.20	55.63	60.37	17,300	-2.51	.012	0.29	.12	.84
AIM-	5.58	2.69	0.24	5.09	6.06	6.31	3.64	0.20	5.92	6.7	18,819	-1.33	.184	0.23	.06	.67
Admiration and bonding to the hypnotist	3.51	1.61	0.15	3.22	3.8	3.13	1.45	0.08	2.97	3.28	17,704	-2.19	.028	0.25	.10	.75
Fear of negative appraisal	2.92	1.45	0.13	2.66	3.18	2.59	1.29	0.07	2.46	2.73	17,857	-2.07	.038	0.24	.10	.70
Need for dependence	3.92	1.58	0.14	3.64	4.21	3.57	1.51	0.08	3.41	3.73	17,630	-2.25	.024	0.23	.11	.67

It has to be noted, however, that the difference across hypnotists may be attributed largely to the imbalanced proportion of psychology students. Given that most psychology students were hypnotized within the frame of the courses of E.E., it may mean an “emotional bias”, i.e. her students showed emotional involvement towards her because she is a well-known (and popular) teacher independently of hypnosis (Bányai et al., 2001).²⁵ Therefore, it seemed logical to check whether the hypnotist effect can also be detected in the core sample ($n = 191$), which includes much less psychology students. According to ANOVA, no difference was found in either AIM+ [$F(3, 187) = 0.94, p = .42$] or in AIM– scores [$F(3, 187) = 0.763, p = .52$]. Hypnotists did not evoke deviating levels of admiration and bonding [$F(3, 187) = 0.39, p = .76$] or fear of negative appraisal [$F(3, 187) = 1.09, p = .36$]. Kruskal-Wallis test revealed a significant difference in the need for dependence across hypnotists [$\chi^2(3) = 8.87, p = .03$]. Post hoc comparisons across hypnotists (corrected for Holm-Bonferroni criteria) revealed that subjects of C.C. ($n = 6$) and E.E. ($n = 6$) expressed higher need for dependence than those of F.F. ($n = 23$), with a strong effect size (subjects of C.C. *versus* F.F. $r_{ES} = .44$; subjects of E.E. *versus* F.F. $r_{ES} = .46$), but the results must be treated with caution due to the small sample sizes.

The above presented results, in general, suggest that AIM is a reliable and valid measure of archaic involvement, showing very good internal consistency and a factor structure similar to earlier large-sample Hungarian findings. Females showed larger archaic involvement than males, although the magnitude of the effect was rather small; a difference of the same scale was observed between psychologists *versus* non-psychologists. Analysis of the entire sample revealed a medium-sized experimenter (hypnotist) effect, which disappeared when only the core sample was analyzed. We may attribute this effect to the fact that the majority of the psychology students, hypnotized by a well-known and popular teacher, may have shown high emotional involvement during her hypnosis sessions. Although some significant between-hypnotist effects also emerged in the much smaller core sample (including much fewer psychologists), these effects do not seem to be systematic, and they may be due to small sample sizes.

6.7. Phenomenology of Consciousness Inventory (PCI)

The 53-item PCI has been used regularly in our laboratory since the 1990s. Varga (2004) reported a confirmative factor analysis on a sample of 104 subjects, who filled in the PCI following individual SHSS:C sessions. Given that SHSS:C scores and previously obtained HGSHS:A scores of the Ss showed a strong correlation ($r = .73, p < .001$), and that the intercorrelation matrices of PCI were rather similar for the two hypnotizability testing procedures, it seems that SHSS:C and HGSHS:A evoke similar phenomenological changes related to altered consciousness. Therefore we can compare model fit indices in the present sample—at least that of the 5 first-order factor solutions—to those emerged in the study of Varga (2004).

The 53 items of the measure can be categorized into two factor structures. As presented in Section 5.5.3, the original solution consisted of 12 first and 14 second-order subscales (Pekala, 1982, 1991) which described some general features of ASCs (e.g., Imagery), and some specific aspects (e.g., under Imagery, Amount, and Vividness can be differentiated). Although this classification gives a very detailed picture of the phenomenological changes in the subject in the respective state, it gives 26 data points for each S, which is hard to handle, even for a smaller sample size. That was the reason why Kumar et al. (1996) developed a simplified and more general system to assess phenomenological changes, resulting in a 5-factor solution (Dissociative control, Positive affect, Negative affect, Visual imagery, and Attention to internal processes), producing a less detailed but manageable dataset. It seemed reasonable to check the fit of both the 14+12 and the 14+5 solution in the present database. Results of confirmative factor analysis of PCI are summarized in Table 35 and Figure 22. Due to the complexity of these factor structures, just the 14+12 structure and the covariance coefficients of the items and their factor are depicted. The intercorrelations between the 12 and the 5 main factors are presented in Table 36 and Table 37, respectively.

²⁵ Certainly we cannot exclude that certain behavioral or character differences between the hypnotists also played a role in these findings.

Phenomenology of Consciousness Inventory: Structure of the 12 first-order and 14 second-order factor structure proposed by Pekala (1991) (N = 565)
 $\chi^2 = 3225.55$, $df = 1246$, $p < .0001$, $CMIN/df = 2.61$, $CFI = .86$, $TLI = .84$,
 $RMSEA = .053$ [.051-.056], $PCLOSE = .006$

The model shows acceptable fit

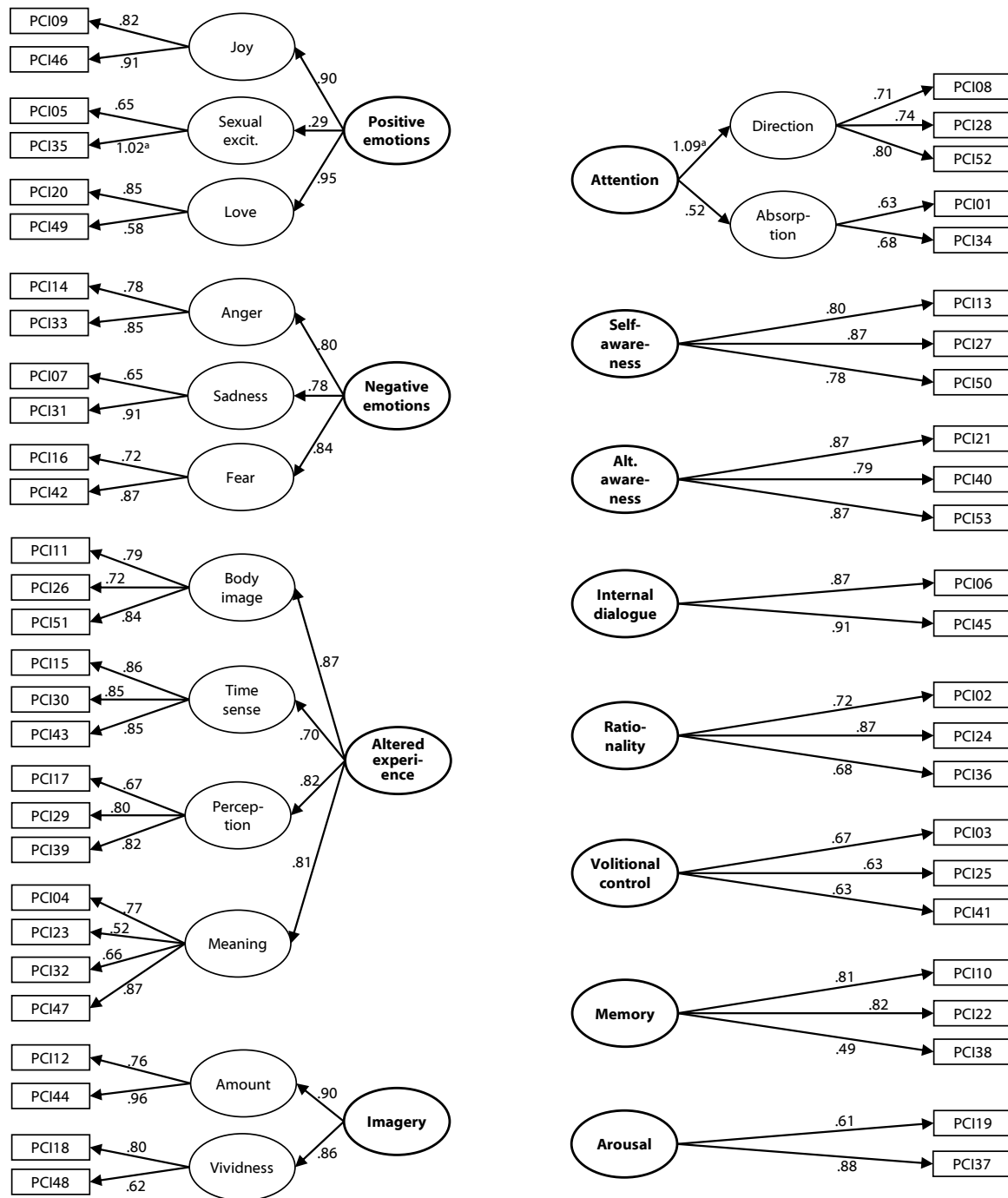


Figure 22 | Factor structure of the Phenomenology of Consciousness Inventory (14+12 factors solution).
Note. All coefficients are significant ($p < .001$). Intercorrelations between the factors can be found separately, in **Table 37**. ^aThe coefficient larger than 1 indicates a Heywood case (explanation in the text).

Table 35 | Model fit indices of different factor solutions for the Phenomenology of Consciousness Inventory ($N=565$)

Model	χ^2 (df)	CMIN/df	CFI	TLI	RMSEA	CI (RMSEA)	PCLOSE	AIC	$\Delta\chi^2$ (Δ df)
<i>Reference values</i>	<i>ns.</i>	<2 (<5)	$\geq .90$	$\geq .90$	$\leq .05$	$\leq .05$	<i>ns.</i>	<i>Lowest</i>	
PCI 1 factor	9296.64* (1325)	7.02	.42	.40	.103	.101–.105	$< .001$	9614.64	
PCI 12 factors	4778.3* (1260)	3.79	.75	.72	.070	.068–.072	$< .001$	5226.3	4518.34* (65) ^a
PCI 14+12 factors	3225.55* (1246)	2.61	.86	.84	.053	.051–.056	.006	3731.55	1552.75* (14) ^b
PCI 14+5 factors in Varga (2004), $N=103$	184.24 ns. (156)	1.18			.042				
PCI 14+5 factors in the present sample	3268.19* (1285)	2.54	.86	.85	.052	.050–.055	.043	3666.72	-42.64 ns. (39) ^c

Note. ^aAs compared to the 1 factor solution. ^bAs compared to the 12 factors solution. ^cAs compared to the 14+12 factors solution. * $p < .0001$.

The table shows that both the 14+12 and the 14+5 factors solution, even without permitting correlated items, show acceptable fit. The two structures do not differ in their comparative fitness, suggesting that both of them can be used in further analyses.

You can see in **Figure 22**, depicting the 14+12 factor structure of PCI, that the first-order Attention factor has a loading on its Direction second-order factor which is higher than 1. As we saw in Section 6.3 on the Emotional Contagion Scale, this phenomenon—not unknown in CFA—is the so-called Heywood case. It emerges when between the error terms of the latent variables a negative error variance occurred. It is usually a consequence of multicollinearity (an overlap between the two factors). Let us note that “Attention” and “Direction of Attention”, although not exactly the same, are partially recursive, i.e. they define each other. Therefore it is not surprising if they show multicollinearity. Another possible explanation is that, like other scales, PCI subscales may be distributed non-normally. However, Heywood case is not a reason for ruling out the analysis, but it also warns that in the future, a more robust way of CFA, bearing non-normality, should be applied.

In **Table 32** you can notice that two rows—the ones showing the 14+12 factors and the 14+5 factors solution—are marked with green. It is so because, according to the reference values, both solutions show acceptable fit. The 14+12 second- and first-order factors solution CFA was performed under standard conditions; for the 14+5 factor structure, the same constraints were used as in [Varga \(2004\)](#). In the initial model she set a factor loading +1 between each second-order (from the 14) and first-order (from the 5) factors that had the highest loading in preliminary explorative analysis; and those two first-order factors that had the highest correlation in the preliminary analysis, had a pre-set correlation of -1 . Besides that she permitted error terms to be correlated in a small fraction (6.2%) of the cases; this was not applied in the present analysis, since as you can see in the last row of the table, the fit indices showed sufficient model fit even without this methodological loosening. As you can see, the CFA conducted by Varga resulted in a much lower χ^2 value and degrees of freedom than in the analysis of the present data. Although she did not report about it, we can infer that she did not include the single items in the analysis, just the “three-level” factor structure (of the 14, 12 and 5 factors). It may make a difference in the *scale* of model fit indices that takes sample size in account, but it does not distort their *pattern*.

It was a question whether the 14+12 or the 14+5 factor solution shows better fit. Therefore their χ^2 values and degrees of freedom were compared with the test proposed by [Satorra and Bentler \(2001\)](#). Since the difference in these values is not significant (which would have indicated that one hypothetical solution fits the data better than the other), we can conclude that both models

are appropriate and can be used for further analyses²⁶. In the following, to save space, the 12 and the 5 main factors will be used. **Table 36** contains those for the 5 factors, while **Table 37** (next page) shows intercorrelations for the 12 factors.

Table 36 | Intercorrelations for PCI 5 first-order factors in the present sample ($N = 565$, in regular typeset) and in [Kumar et al. \(1996\)](#) ($N = 575$, in italics). Note. In cells with **bold letters** a significant difference was found in the intercorrelations between the two samples.

	Dissociative control	Positive affect	Negative affect	Visual imagery	Attention to internal proc.
Dissociative control	1				
Positive affect	.55* .52*	1			
Negative affect	.10 .30*	.02 .39*	1		
Visual imagery	.20* .18*	.30* .36*	-.04 .09	1	
Attention to internal proc.	.71* .76*	.47* .48*	.07 .18*	.16* .14	1

Note. * $p < .001$. Significance values (of the present findings) are adjusted for Holm-Bonferroni criteria.

The table shows that in general, in the present sample, similar intercorrelations were observed to those in the study of Kumar et al. (1996). The differences are discussed in the text.

Intercorrelations among the PCI-5 factors in the present sample and in [Kumar et al. \(1996\)](#) were compared pairwise with Fisher's r -to- z transformation. Of the 10 comparisons, 3 proved to be significant: in Kumar et al.'s sample, a higher correlation was observed between *Dissociative control* and *Negative affect* ($z = -3.52, p < .001$), a much higher correlation between *Negative* and *Positive affect* ($z = -6.6, p < .001$), and a higher correlation between *Negative affect* and *Attention to internal processes* ($z = -2.19, p = .003$) than in the present sample. In the interpretation of these results it has to be taken in account that while Kumar and her colleagues instructed to fill in the PCI regarding a short "sitting in quietly" period embedded in the HGSHS:A session (soon before dehypnosis), in our laboratory, the Ss were instructed to fill in the PCI with respect to the whole hypnosis session, which may make a difference in the relationship between perceived negative effects and alterations in consciousness.

Now, let's take a look at the mean scores and internal consistency of the subscales. Since the 5-factor solution is based on standardized (z -transformed) scores, it would be meaningless to report their descriptive statistics. Although there are a large number of items in the questionnaire, there are also many factors. Some factors (like Arousal and Internal dialogue) include only 2 items. Therefore, if a S responds to even some items in a conflicting manner, may lead to severe biases in the total scores. Besides calculating Cronbach alpha values for the factors, PCI has a generic reliability scale, calculated from the absolute difference of 5 pairs of items (which have the same content but the response-options are reverted). If the absolute value of the average of the pairwise differences is greater than 2, [Pekala \(1991\)](#) suggests to exclude the inconsistent respondents from further analyses. In the present sample, 10 cases of the 565 (0.017%) were found when the PCI reliability index exceeded the cut-off value. Thus, in subsequent analyses, the data of the remaining 555 subjects were used.

²⁶ It has to be noted, however, that this factor structure was just tested in studies where PCI was administered after laboratory hypnosis sessions. Our research team is currently working on testing whether PCI has the same structure if it is filled in respective to other states of altered consciousness.

Table 37 | Intercorrelations for PCI 12 first-order factors ($N= 565$)

	Positive affect	Negative affect	Alt. experience	Visual imagery	Attention	Self-awareness	Altered st. of awar.	Internal dialogue	Rationality	Volitional control	Memory	Arousal
Positive affect	1											
Negative affect		1										
Altered experience	.58*		1									
Visual imagery	.27*			1								
Attention	.23*	-.27*	.33*	.14*	1							
Self-awareness	-.33*		-.59*	-.21*	-.32*	1						
Altered state of awareness	.37*		.68*	.16*	.36*	-.64*	1					
Internal dialogue		.15*			-.13*	.17*		1				
Rationality	-.16*	-.25*	-.35*			.49*	-.40*		1			
Volitional control	-.26*		-.44*	-.16*	-.32*	.62*	-.53*		.44*	1		
Memory	-.13*		-.31*		-.18*	.46*	-.42*		.44*	.35*	1	
Arousal	-.17*	.36*	-.19*		-.45*	.21*	-.22*	.16*		.19*		1

Note. * $p < .001$. Significance values are adjusted for Holm-Bonferroni criteria. For better readability, just the significant values are presented.

The 12 first-order and 14 second-order factor solution of PCI was also used in a large-scale study by [Pekala and Kumar \(1987\)](#), and later, in our laboratory, by [Józsa \(2012\)](#). In **Table 38**, you can see the present PCI data compared to that obtained by Pekala and Kumar. Due to the large number of comparisons, after adjusting the results with the Holm-Bonferroni procedure to prevent the accumulation of Type I error, three PCI scales still show remarkable differences between the two studies. In the present sample, the Ss expressed significantly less attention, but more self-awareness and more internal dialogue than did the Ss of Pekala and Kumar. Still, in general, even with these three medium-effect differences, the two datasets seem to be comparable. This pattern was also observed by [Józsa \(2012\)](#): In her study, Self-awareness, Rationality, and Internal Dialogue had a similar deviation from Kumar & Pekala’s findings. In interpreting these findings, she remarks that almost three decades passed since 1987, and the Ss represent different cultures (and may also belong to a different age group with more various professions). Besides that, we should not forget that in the original studies, PCI is filled in with regard to a relatively short “sitting silently” phase, while in our investigations the Ss responded to PCI with regards to the whole hypnosis session.

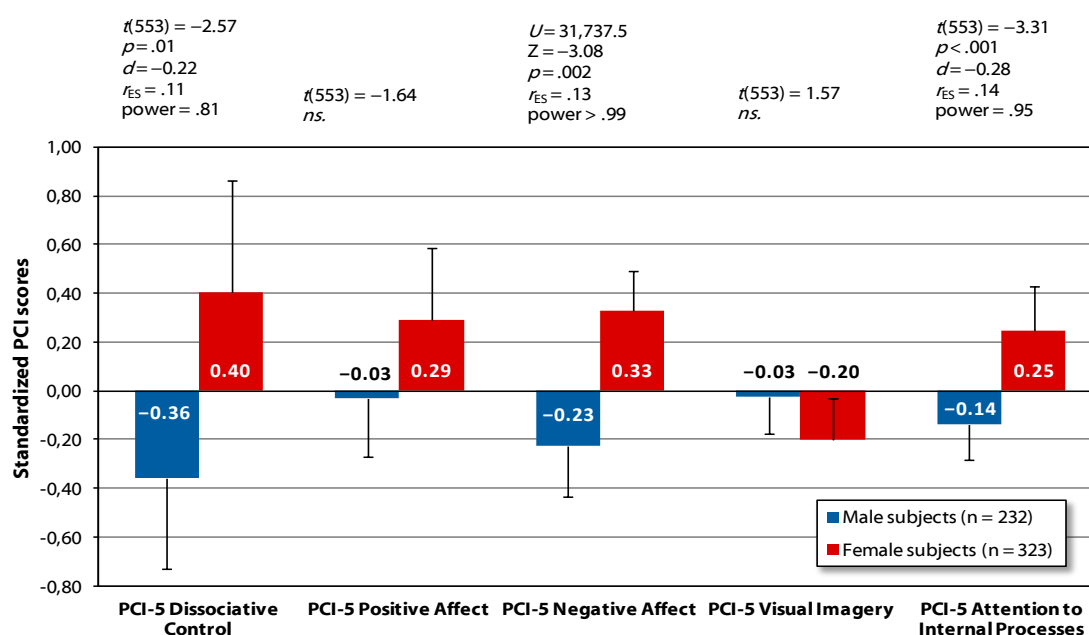


Figure 23 | PCI-5 mean scores of male and female subjects.

Note. Error bars indicate 95% confidence interval. Above the bars, statistical comparisons (Student’s t or Mann-Whitney U tests) across genders are indicated.

Figure 23 shows the gender differences in PCI-5 subscales. Female Ss showed significantly higher Dissociative control, Negative affect and Attention to internal processes than males, but the effect sizes indicate that the differences are of small magnitude. No gender difference was observed in Positive affect and Visual imagery. Gender analysis (with ANOVA) in the PCI 14+12 factors (corrected for Holm-Bonferroni criteria) revealed the following differences: Female Ss showed significantly greater alteration in the experience [$t(553) = -3.10$, $p = .002$, $d = -0.26$, $r_{ES} = .13$, power = .91], greater alteration in body image [$t(553) = -3.52$, $p < .001$, $d = -0.29$, $r_{ES} = .15$, power = .95], more negative affect [$t(553) = -3.73$, $p < .001$, $d = -0.32$, $r_{ES} = .16$, power = .98], and more fear [$t(553) = -3.14$, $p = .002$, $d = -0.26$, $r_{ES} = .13$, power = .91]. Again, the magnitude of the differences is small. On the other 22 subscales of PCI, no significant differences were observed (or only very weak effects).

Table 38 | Mean scores and internal consistency of PCI main and subscales in [Pekala and Kumar \(1987\)](#) and in the present sample

Subscale	No of items	Pekala & Kumar (1987) (N= 342)		Present sample (N= 555)					Difference				
		M	SD	M	SD	CI(min)	CI(max)	Cr-alpha	t (df=895)	p ^a	d	r _{ES}	power
Altered experience	13	2.37	1.27	2.26	1.22	2.16	2.36	.883	-1.29	ns.	-0.09	.04	.40
Altered body image	3	2.9	1.65	2.51	1.53	2.38	2.64	.802	-3.59	< .001	-0.24	.12	.98
Altered time sense	3	3.29	1.86	2.95	1.91	2.80	3.12	.878	-2.61	ns.	-0.17	.09	.84
Altered perception	3	2.02	1.73	2.17	1.56	2.04	2.30	.770	1.34	ns.	0.09	.04	.40
Altered meaning	4	1.54	1.39	1.62	1.33	1.51	1.73	.761	0.86	ns.	0.06	.03	.23
Positive affect	6	1.42	1.43	1.36	1.08	1.27	1.45	.762	-0.71	ns.	-0.05	.02	.19
Joy	2	1.6	1.64	1.53	1.61	1.40	1.66	.826	-0.63	ns.	-0.04	.02	.15
Sexual excitement	2	0.84	1.57	0.32	0.93	0.24	0.39	.874	-6.23	< .001	-0.42	.20	> .99
Love	2	1.81	1.78	2.24	1.67	2.10	2.38	.685	3.65	< .001	0.24	.12	.98
Negative affect	6	0.70	1.04	0.63	0.86	0.55	0.70	.707	-1.36	ns.	-0.09	.05	.40
Anger	2	0.67	1.20	0.70	1.26	0.60	0.81	.560	0.35	ns.	0.02	.01	.09
Sadness	2	0.74	1.28	0.63	1.11	0.54	0.72	.711	-1.36	ns.	-0.09	.05	.40
Fear	2	0.69	1.28	0.54	1.10	0.45	0.63	.700	-1.86	ns.	-0.12	.06	.59
Attention	5	4.09	1.26	3.34	0.81	3.27	3.41	.749	-10.85	< .001	-0.72	.34	> .99
Direction	3	4.02	1.51	4.14	1.06	4.05	4.22	.807	1.40	ns.	0.09	.05	.40
Absorption	2	4.19	1.54	3.81	1.30	3.71	3.92	.604	-3.96	< .001	-0.26	.13	.99
Imagery	4	2.25	1.51	2.51	1.41	2.39	2.62	.814	2.61	ns.	0.17	.09	.84
Amount	2	2.10	1.82	2.22	1.69	2.08	2.36	.851	1.00	ns.	0.07	.03	.29
Vividness	2	2.41	1.64	2.79	1.49	2.67	2.91	.669	3.57	< .001	0.23	.12	.97
Self-awareness	3	3.28	1.73	4.23	1.32	4.12	4.34	.853	9.27	< .001	0.62	.29	> .99
Altered awareness	3	3.70	1.91	3.05	1.59	2.92	3.19	.872	-5.05	< .001	-0.34	.17	> .99
Arousal	2	1.42	1.47	1.79	1.47	1.66	1.91	.709	3.66	< .001	0.24	.12	.98
Rationality	3	3.40	1.78	4.15	1.34	4.04	4.26	.780	7.17	< .001	0.48	.23	> .99
Volitional control	3	2.70	1.66	3.17	1.26	3.07	3.28	.677	4.79	< .001	0.32	.16	> .99
Memory	3	3.91	1.66	4.27	1.09	4.17	4.35	.710	3.92	< .001	0.26	.13	.99
Internal Dialogue	2	1.95	1.96	3.21	1.93	3.05	3.37	.900	9.44	< .001	0.63	.30	> .99

Note. ^aAdjusted for Holm-Bonferroni criteria.

The differences between psychologist and non-psychologist Ss can be found in **Table 39**. As you can see, a very similar (but in most of the cases, even weaker) pattern was found than across genders. According to the parametric t tests and nonparametric Mann-Whitney tests, psychologists showed somewhat higher Dissociative control, Attention to internal processes and less Negative affect than did non-psychologists; but even for negative emotions, the effect size did not reach medium magnitude. More detailed analysis, with the 14+12 factors of PCI, revealed that psychologists experienced a higher alteration in time sense [$t(450) = 3.57, p < .001, d = 0.34, r_{ES} = .17, \text{power} = .98$] and less rationality [$t(450) = -3.26, p = .001, d = -0.31, r_{ES} = .15, \text{power} = .87$] than non-psychologists. Following a Holm-Bonferroni correction, no other differences between psychologists and non-psychologists (either significant or medium-size effect) emerged.

From these patterns we can conclude that a more detailed breakdown in professions would have not lead to deviations in phenomenology of consciousness. Analyses of variance supported this notion for Dissociative control, Positive affect, Negative affect, and Imagery [$F(5, 446)$ between 0.09 and 1.91, $p > .09$]. However, in Attention to internal processes, a significant effect of profession was detected: $F(5, 446) = 4.57, p < .001, \omega = .19, \text{power} = .99$. The post hoc Hochberg's GT2 values suggest that psychologists and healthcare providers showed significantly higher inward attention than the IT/engineering professionals ($p = .02$), economy/commerce professionals ($p = .008$), or those working in the legal/administrative area ($p = .007$).

Table 39 | Differences between psychologists and non-psychologists in Phenomenology of Consciousness Inventory (5 factor solution) ($N=452$)

PCI Subscale	Psychologists ($n=120$)					Non-Psychologists ($n=332$)					Comparison ($df=450$)				
	<i>M</i>	<i>SD</i>	<i>SE</i>	CI (min)	CI (max)	<i>M</i>	<i>SD</i>	<i>SE</i>	CI (min)	CI (max)	Test stat.	<i>p</i>	<i>d</i>	<i>r</i> _{ES}	power
Dissociative Control	0.58	3.37	0.31	-0.03	1.18	-0.16	3.52	0.19	-0.54	0.22	$t=1.99$	.047	0.19	.09	.55
Positive Affect	0.21	2.21	0.20	-0.18	0.61	-0.04	2.27	0.12	-0.28	0.21	$t=1.06$	.292	0.09	.05	.21
Negative Affect	0.43	1.92	0.18	0.08	0.78	-0.10	1.43	0.08	-0.25	0.06	$U=16.99$ $Z=-2.38$	.02	0.31	.24	.88
Visual Imagery	-0.13	1.38	0.13	-0.38	0.12	-0.11	1.29	0.07	-0.25	0.03	$t=-0.155$	.877	-0.01	< .01	.06
Attention to Internal Processes	0.45	1.29	0.12	0.21	0.68	-0.09	1.36	0.07	-0.24	0.05	$t=3.78$	< .001	0.35	.18	.94

Student's *t* tests and Mann-Whitney tests showed that PCI scores of psychologists and non-psychologists do not differ from each other, with one exception: Psychologists showed significantly higher attention to their internal processes under hypnosis. The difference is, however, small-sized.

Using the 14+12 factor solution, no significant effect of profession was detected, possibly due to the large number of comparisons. There were two ANOVA tests that would have been significant at $p \leq .01$ level without the Holm-Bonferroni correction. The factors in question were the Altered State of Awareness [$F(5, 453) = 3.03, p(\text{unadjusted}) = .01, \omega = .17, \text{power} = .86$] and Altered Time Sense [$F(5, 453) = 4.50, p(\text{unadjusted}) = .001, \omega = .19, \text{power} = .96$], indicating that in both cases there was a small-medium professional effect. *Post hoc* Hochberg's GT2 tests suggest that psychologists and healthcare workers experienced more alteration in their awareness than IT/engineering professionals ($p = .034$) or those working in economy and commerce ($p = .036$). It is also psychologists/healthcare providers who experienced more alteration in their time perception than Ss from the fields of economy/commerce ($p = .015$), legal issues/administration ($p = .007$), or culture/science ($p = .015$). Such cases show that testing for significance on its own tells nothing about the effect. Even if we cannot say with 95% warranty that "it is not true that there is no effect" (indicated by $p = .005$), effect sizes can show that even if we were wrong in refusing the null hypothesis, a rather large difference can still be there. This is further supported by the rather large values of statistical power, suggesting that the tests are adequately sensitive.

It was also checked whether or not different hypnotists evoke different phenomenological experiences. Although the social-psychobiological theory postulates that ASC emerges in the context of the relationship between the S and the H (Bányai, 1991), the experiences related to alteration in consciousness are "private" by nature. Therefore we can expect that the hypnotist variables will not have as much effect on them as the subjects' characteristics. For instance, male and female subjects may have "more" different experiences than those hypnotized by male *versus* female hypnotists. Analyses of variance partly supported this notion. By ANOVA, no experimenter effect was found in Dissociative control [$F(5, 549) = 2.07, p = .07$], in Negative affect [$F(5, 549) = 2.35, p = .16$], or in Visual imagery [$F(5, 549) = 1.48, p = .19$]. Hypnotists evoked different levels of Positive affect: $F(5, 549) = 2.349, p = .04, \omega = .07, \text{power} = .99$. A similar difference was detected in Attention to internal processes: $F(5, 549) = 2.72, p = .02, \omega = .12, \text{power} = .98$. The latter two effects, albeit significant, bear a rather small effect; *post hoc* analysis of Hochberg's GT2 indices revealed no difference between single hypnotists. It has to be emphasized again that in hypnotist differences a confounding factor can be that the distribution of the psychology student Ss were imbalanced across hypnotists (the vast majority of them were hypnotized by their teacher, E.E.). This finding again warns future hypnosis researchers not to recruit psychologists or psychology students to participate in the investigation, or if they do, take these possible biases into account.

6.8. Summary

The above findings, in general, suggest that the measures of parental rearing, mentalization skills, and hypnotic response show good reliability and structural validity. As a brief summary of these results: EMBU showed very good internal consistency and high similarity to earlier findings. No gender or professional differences were detected in recalled parental behavior. The RMET scores showed similar distribution and means as the original; females performed somewhat (but not much) better than males. Profession did not have an influence on "mind-reading in the eyes" skill. Scores of the ECS cannot be compared directly to earlier findings, because the original, 4 point scoring was used; in further studies, it would make more sense to apply the more frequently used, 5 point scoring system. In the negative aspect (and total scores) of emotional contagion, women largely outperformed men. According to TAS-20 scales, subjects of the present study got much higher scores than as reported in the Hungarian reference sample, possibly because the Ss in the present study were older and more diverse in their professions than those examined in the standardization study. Professionals in the field of IT and engineering (and the "other" subgroup, which included retired and unemployed Ss as well) showed the highest, while psychologists and those who worked in cultural or scientific fields showed the smallest TAS scores. The HGSHS:A was also comparable to previous results; reliability analysis suggested that the subscales should not be applied due to their low Cronbach alpha values. Structural validity of AIM and PCI suggested that they have very good reliability. Females in all three measures showed somewhat greater hypnotic response than males, including alterations in consciousness, although effect sizes did not exceed medium level. Still, this

finding actually contradicts our earlier notion that gender difference in hypnotic susceptibility is solely or largely a product of social psychological processes ([Költő et al., 2015](#)). We will get back to this topic in the Discussion chapter. Psychologists, in accordance with earlier observations ([Gösi-Greguss et al., 1996](#); [Költő et al., 2015](#)) also showed higher hypnotic response than non-psychologists. Across more detailed categories of profession, Ss did not demonstrate different levels of behavioral hypnotizability or archaic involvement. In the phenomenological experiences related to ASC, however, some differences emerged. In general, we can say that professionals and students from the field of psychology and healthcare demonstrated greater alterations in their consciousness (compared to everyday wakefulness) than others, especially engineers and people in Information Technology. Such effect was detected in Attention to Internal Processes, Altered Awareness and Altered Time Sense. According to detailed analyses, it also turned out that people from the fields of science and culture also showed higher alterations in their consciousness (at least, in some sub-dimensions of PCI), while those from economy, commerce, law, and administration rather showed less alterations as compared to everyday consciousness. Does this mean that we should exclude psychology students as Ss from further hypnosis research? I don't think so. Nevertheless, researchers should take into consideration that participation of psychology students and psychologists, without keeping the "profession variable" under control, may severely distort their findings. This notion will also be discussed later.

In the above presented findings, the professional effect was most probably confounded with the "hypnotist effect" (i.e., that there were systematic differences in the hypnotic responses of Ss hypnotized by different experimenters). This may have been due to the uneven distribution of psychology students, who were mostly hypnotized by one of their teachers. When analyzing the core sample (the part of the sample which responded to all measures, with much less psychology students in a more balanced distribution), most of these confounding effects disappeared. We can conclude, however, that it makes sense to study more hypnotists in hypnosis studies and to make efforts for a more thorough investigation of the "hypnotist effect"—despite the apparent difficulties ([Kihlstrom, 2008](#)).

7. CONVERGENT VALIDITY OF THE MEASURES

IN THE PREVIOUS CHAPTER, WE SAW that the measures for the three constructs showed relatively good reliability and structural validity. It is still a question if the different measures that we think assess “mentalization” and “hypnotic susceptibility” really tap into the same construct. In an optimal case, different tests of a psychological phenomenon tap into its related facets or dimensions (*convergent validity*), but if we hypothesize that the phenomenon is not uniform, but is made up of different dimensions, they will be expected to show some divergence (*discriminant validity*). In terms of correlation, coexistent convergent and discriminant validity results in small to high, but neither non-significant nor full correlations (Campbell & Fiske, 1959).

In this chapter, first the associations between RMET, ECS, and TAS-20 are examined to see whether or not they converge, and thus measure the intended latent “mentalization” ability. Then the relationships among HGSHS:A, AIM, and PCI will be compared. Although there are some studies where the TAS and the RMET are used together, for instance in studies of autism, empathy, or oxytocin (e.g., Luminet et al., 2011), to the my best knowledge, there is only one study, the validation of the Italian version of RMET (Vellante et al., 2012) where its correlation with TAS-20 scores was investigated. I have found no references in the literature where the association of emotional contagion with alexithymia was examined. Therefore it seemed reasonable to check if these variables are related.

For assessment of hypnotic response, we have more evidence. Many studies proved the strong associations between phenomenological changes and hypnotic susceptibility (Pekala & Kumar, 1987; Szabó, 1993; Varga et al., 2001; Mészáros, Szabó, & Csákó, 2002; Józsa, 2012; or, most recently, Cleveland, Korman, & Gold, 2015). The relationship between archaic involvement and behavioral hypnotizability scores is also extensively studied (Nash & Spinler, 1989; Bányai, 1998; Bányai et al., 2001; Józsa, 2012). These works also refer to the associations between phenomenological changes and archaic involvement. Thus, in the present study, the correlations among these measures will be just “for the record”; instead, I will rather concentrate on checking how HH, MH, and LH differ across these measures.

7.1. Measures of mentalizing ability

Correlations between RMET and ECS scores are presented in **Table 40**. No significant correlations were found between the two measures, either in the entire sample or in gender breakdown. Observed power varied between .001 and .62.

Table 40 | Correlations between Reading the Mind in the Eyes Test and Emotional Contagion Scale scores in the entire sample, males and females

	ECS Positive	ECS Negative	ECS Total
RMET Entire sample (N= 354)	.10 <i>ns.</i>	.07 <i>ns.</i>	-.02 <i>ns.</i>
RMET Male Ss (n = 150)	.02 <i>ns.</i>	.01 <i>ns.</i>	-.03 <i>ns.</i>
RMET Female Ss (n = 204)	.05 <i>ns.</i>	.02 <i>ns.</i>	-.03 <i>ns.</i>

A similar pattern was observed in the correlations between the RMET and the TAS (**Table 41**). Observed power did not exceed .53.

Table 41 | Correlations between Reading the Mind in the Eyes Test and Toronto Alexithymia Scale scores in the entire sample, males and females

	TAS-20 DIF	TAS-20 DDF	TAS-20 PRT	TAS-20 Total
RMET Entire sample (N= 245)	.06 <i>ns.</i>	-.09 <i>ns.</i>	-.16 <i>ns.</i>	-.06 <i>ns.</i>
RMET Male Ss (n = 103)	<-.01 <i>ns.</i>	-.20 <i>ns.</i>	-.20 <i>ns.</i>	-.17 <i>ns.</i>
RMET Female Ss (n = 142)	.08 <i>ns.</i>	-.02 <i>ns.</i>	-.11 <i>ns.</i>	< .01 <i>ns.</i>

Note. DIF = Difficulty in Identifying Feelings, DDF = Difficulty in Describing Feelings, PRT = Pragmatic Thinking. Significance levels are adjusted for Holm-Bonferroni criteria.

These values are rather low. In the validation study of the Italian RMET, [Vellante et al. \(2012\)](#) observed a similar strength of correlation between TAS-20 and RMET (for males, $r = -.22$, $p < .01$, for females, $r = .02$, *ns.*, for the entire sample, consisting of 200 Ss, $r = -.12$, *ns.*)

The correlations between ECS and TAS-20 scores are presented in **Table 42**. Values that are significant or have a power higher than .80 are highlighted. The discrepant significance and power in the correlation matrix of ECS and TAS-20 indicate a “danger” of multiple comparisons. From the 36 correlations, without adjusting the matrix for Holm-Bonferroni criteria (with $p = .05$ as a critical value), 12 would have been significant. After the correction, only four correlations can be accepted on the basis of their adjusted significance level. It has to be noted, however, that there are two correlations which were eliminated by Holm-Bonferroni procedure, but on the other hand, they show statistical power higher than .80, which clearly indicates that the test would actually “catch” the effect. Referring back to [Cohen \(1990\)](#), effect size and statistical power may be even more important than statistical significance.

The somewhat accidental (we could even call it ridiculous) feature of statistical significance, and our attempts to control it, is also marked by that the correlation between general susceptibility to emotional contagion and Pragmatic Thinking, $r = -.201$ is not significant, while the association between ECS Negative and Difficulty in Identifying Feelings, $r = +.202$ (practically the same strength of correlation in absolute value!) is significant. Had I presented these data in separate tables, with separate adjustments, maybe both values would have remained significant. I think this “nuance” clearly shows that we should not be over reliant on p -values, but should pay more attention to power and effect size.

Therefore, beside the four correlations remaining significant after Holm-Bonferroni procedure, I also highlighted those two that were suppressed by the Holm-Bonferroni adjustment while have a power exceeding the desirable .80. It is also important to notice that there are some correlations in **Table 42** that are neither significant nor powerful “enough”, but they still indicate a small-medium effect (a positive relationship exceeding $r = .20$ between positive emotional contagion and difficulty in identifying feelings in both genders as well as in the entire sample).

In sum, there seems to be a general low-medium negative association between TAS Pragmatic Thinking and all dimensions of emotional contagion in the entire sample and in males separately. This suggests that the more externally oriented and stimulus-bound someone’s thinking style is, the less s/he will be prone to automatically mimic the emotional expressions of other people (to a small extent). This association, however, was not detected in women.

Table 42 | Correlations between Emotional Contagion Scale and Toronto Alexithymia Scale scores in the entire sample, males and females

	Entire sample (<i>N</i> = 244)				Males (<i>n</i> = 103)				Females (<i>n</i> = 141)			
	DIF	DDF	PRT	TOT	DIF	DDF	PRT	TOT	DIF	DDF	PRT	TOT
ECS Total	.00 <i>ns.</i>	-.09 <i>ns.</i>	-.201 <i>ns.</i> pow = .83	-.11 <i>ns.</i>	.01 <i>ns.</i>	-.16 <i>ns.</i>	-.26 <i>p</i> < .001 pow = 98	-.17 <i>ns.</i>	-.02 <i>ns.</i>	-.02 <i>ns.</i>	-.13 <i>ns.</i>	-.06 <i>ns.</i>
ECS Positive	.26 <i>ns.</i>	-.04 <i>ns.</i>	-.26 <i>p</i> < .001 pow = .98	.03 <i>ns.</i>	.23 <i>ns.</i>	-.02 <i>ns.</i>	-.22 <i>ns.</i>	.03 <i>ns.</i>	.22 <i>ns.</i>	.06 <i>ns.</i>	-.15 <i>ns.</i>	.10 <i>ns.</i>
ECS Negative	.202 <i>p</i> = .001 pow = .89	-.07 <i>ns.</i>	-.29 <i>p</i> < .001 pow > .99	-.03 <i>ns.</i>	.17 <i>ns.</i>	-.09 <i>ns.</i>	-.28 <i>ns.</i> pow = .88	-.06 <i>ns.</i>	.17 <i>ns.</i>	.04 <i>ns.</i>	-.18 <i>ns.</i>	.05 <i>ns.</i>

Note. DIF = Difficulty in Identifying Feelings, DDF = Difficulty in Describing Feelings, PRT = Pragmatic Thinking, pow = statistical power. Significance levels are adjusted for Holm-Bonferroni criteria. Correlations are set in **bold letters** if correlation (after the adjustment) was significant, or if its power was over .80.

The question arises whether correlations are non-significant because the variables are associated in a nonlinear fashion (for instance, showing U- or bell-shaped relationship) or not. If it was the case, alexithymia grouping would make significant differences in other mentalizing subskills, with the sub-clinical group showing either the highest or the lowest ability of reading in the eyes or propensity for emotional contagion. (As we will see in the next chapter, this is the case with alexithymia and hypnotic response.) Across alexithymics, sub-alexithymics, and alexithymics, ANOVA revealed no difference in the ability to read the mind in the eyes [$F(2, 242) = 1.39, p = .25, \omega = .05, \text{power} = .87$]. Subjects with different levels of alexithymia did not exhibit different levels of positive [$F(2, 241) = 0.1, p = .85, \omega < .01, \text{power} = .06$], negative [Kruskal-Wallis $\chi^2(2) = .09, p = .95$], or in overall emotional contagion [$F(2, 241) = .04, p = .97, \omega < .01, \text{power} = .05$]. These results also suggest that there is no nonlinear (e.g., quadratic) association between alexithymia, mind-reading in the eyes, and emotional contagion.

The above findings show that reading the mind in the eyes, emotional contagion, and alexithymia are not at all, or just poorly related measures, therefore it is not justified to treat them as related facets of a latent variable (“mentalization”).

7.2. Measures of hypnotic response

Correlations between HGSHS:A observer- and self-scores, and AIM+, AIM– and AIM subscales are presented in **Table 43**. As you can see, positive aspects of archaic involvement show a medium-sized correlation (r between .24 and .51) with HGSHS:A scores, while the negative emotions towards the hypnotist do not seem to be associated with behavioral hypnotizability. These values are very similar to those reported in earlier studies, e.g., in [Józsa \(2012\)](#), where these associations were between .20 and .48. No difference was observed across genders or observer- *versus* self-scores ($0.30 \leq Z \leq 1.40, .16 \leq p \leq .76$).

Table 43 | Correlations between Harvard Group Scale of Hypnotic Susceptibility and Archaic Involvement Measure scores in the present sample and in [Józsa \(2012\)](#)

	AIM+	AIM–	AIM Admiration and Bonding	AIM Fear of Negative Appraisal	AIM Need for Dependence
HGSHS:A Observer-score (entire sample, $N = 565$)	.47*	–.01	.47*	.30*	.37*
HGSHS:A Observer-score (males, $n = 235$)	.50*	.07	.48*	.33*	.40*
HGSHS:A Observer-score (females, $n = 330$)	.45*	–.05	.46*	.28*	.33*
HGSHS:A Self-score (entire sample, $N = 565$)	.50*	–.04	.53*	.26*	.40*
HGSHS:A Self-score (males, $n = 235$)	.51*	.02	.51*	.29*	.43*
HGSHS:A Self-score (females, $n = 330$)	.49*	–.08	.54*	.24*	.37*
HGSHS :A Self-score in Józsa (2012) ($N = 370$)	.48*	–.04	.47*	.30*	.41*

Note. Significance levels are adjusted for Holm-Bonferroni criteria. * $p(\text{adjusted}) < .001$. The statistical power of significant correlations exceeds .99, while that of the nonsignificant ones are lower than .05.

Table 44 contains the correlation matrix for the PCI 5-factor solution and HGSHS:A observer- and self-scores for the entire sample and in gender breakdown. Contrasting those (correlations with HGSHS:A self- versus observer scores, respectively correlations in males versus females) revealed no significant differences ($-1.86 \leq Z \leq 0.99, .19 \leq p \leq .49$). When comparing the present correlations (between HGSHS:A self-scores and PCI subscales) to those obtained by [Kumar et al.](#)

(1996), no differences emerged in the association between behavioral hypnotizability scores and Dissociative Control ($Z = -0.46, p = .65$), Negative Affect ($Z = -1.86, p = .07$), or in Visual Imagery ($Z = -0.68, p = .49$). Pekala and his colleagues found a somewhat weaker correlation between Harvard scores and Positive Affect ($Z = 2.33, p = .02$), but stronger correlation with inward attention ($Z = -2.29, p = .02$) than observed in the present sample. We shall not forget, however, that almost two decades passed between the two investigations, and contrary to our experiments (where the Ss filled in the PCI considering the whole hypnosis session), they asked their Ss to respond to it in respect to a short “sitting silently” phase. Apart from these differences, association of the phenomenological and the behavioral aspects of hypnotizability show a correspondence similar to previous investigations, with a medium (around .4 – .5) correlation between HGSHS:A scores and dissociation, and around .3 – .4 correlations with visual imagery and inward attention.

Table 44 | Correlations between Harvard Group Scale of Hypnotic Susceptibility and Phenomenology of Consciousness Inventory 5-factor solution scores in the present sample and in [Kumar et al. \(1996\)](#)

	PCI Dissociative Control	PCI Positive Affect	PCI Negative Affect	PCI Visual Imagery	PCI Attent. to Internal Processes
HGSHS:A Observer-score (entire sample, $N = 565$)	.44*	.38*	.06	.10	.33*
HGSHS:A Observer-score (males, $n = 235$)	.45*	.41*	.06	.14	.35*
HGSHS:A Observer-score (females, $n = 330$)	.50*	.46*	.12	.15	.38*
HGSHS:A Self-score (entire sample, $N = 565$)	.50*	.42*	.01	.14*	.38*
HGSHS:A Self-score (males, $n = 235$)	.42*	.35*	.03	.09	.30*
HGSHS:A Self-score (females, $n = 330$)	.49*	.37*	-.09	.13	.37*
HGSHS :A Self-score in Kumar et al. (1996) ($N = 575$)	.52*	.30*	.12	.10	.49*

Note. Significance levels are adjusted for Holm-Bonferroni criteria. * p (adjusted) < .001. The statistical power of all significant correlations exceeds .80; power of non-significant correlations is in all cases below .80.

To save space, the correlations between the 14+12 factor solution of PCI and HGSHS:A are not presented here. Another way [Cleveland et al. \(2015\)](#) suggest to investigate the relationship between behavioral hypnotizability scores and phenomenological experiences is to check whether the PCI scores are different across subgroups with low, medium, and high hypnotizability. They conducted such an analysis in a sample of 121 subjects. For unexplained reasons, they used a grouping (the cutoff HGSHS:A score between LHs and MHs was 5 instead of 4) different from the regularly used categorization ([Register & Kihlstrom, 1986](#)). They did not report about correcting their results to control familywise Type I error rate, either. Therefore their findings cannot be directly compared to the present ones. Nevertheless, in **Table 45**, which presents rank means and Kruskal-Wallis tests to compare PCI scores across hypnotizability groups, their significant findings are also depicted. Kruskal-Wallis tests were used instead of one-way ANOVA, since many PCI subscales violated the criteria of variance homogeneity.

We can read from the table that there are many differences in the phenomenological experiences of LH, MH and HH groups. In line with previous observations, higher hypnotizability seems to be associated with more alteration in consciousness (including experiences, body image, perception of time, perception in general, attribution of meaning), in positive affects (except for sexual excitement), in attention, and in other aspects of consciousness (including awareness, arousal, rationality, volitional control and memory). Hypnotizability grouping did not seem to make a difference in negative affects and visual imagery. Despite using a smaller sample and non-robust statistical analysis, most of these differences were also found in the study of Cleveland and his colleagues.

Table 45 | PCI scores of low, medium and high hypnotizable subjects (based on their HGSHS:A observer-score) in the present sample and in [Cleveland et al. \(2015\)](#)

PCI Subscales	Mean Ranks in Hypnotizability Groups (HGSHS:A Observer-scores)			Kruskal-Wallis χ^2 (df = 2)	p^a	p (ANOVA) (Cleveland et al., 2015)
	Lows (n = 139)	Mediums (n = 365)	Highs (n = 61)			
Altered Experience	202.90	293.17	404.69	90.42	< .001	<i>ns.</i>
Altered Body Image	209.03	294.39	383.39	70.55	< .001	.009
Altered Time Sense	223.20	291.40	369.02	45.20	< .001	<i>ns.</i>
Altered Perception	231.82	288.89	364.39	47.91	< .001	<i>ns.</i>
Altered Meaning	214.49	291.37	389.05	66.71	< .001	.042
Positive Affect	210.01	294.56	380.14	59.68	< .001	<i>ns.</i>
Joy	215.90	292.21	380.80	56.74	< .001	<i>ns.</i>
Sexual Excitement	267.65	284.01	311.93	7.53	<i>ns.</i>	<i>ns.</i>
Love	220.35	292.23	370.52	49.05	< .001	.050
Negative Affect	270.92	285.79	293.80	3.06	<i>ns.</i>	<i>ns.</i>
Anger	276.93	285.08	284.38	3.86	<i>ns.</i>	<i>ns.</i>
Sadness	275.60	287.59	272.37	7.11	<i>ns.</i>	<i>ns.</i>
Fear	268.90	282.18	320.04	3.24	<i>ns.</i>	<i>ns.</i>
Attention	242.86	283.23	373.11	22.49	< .001	<i>ns.</i>
Direction of Attention	240.11	285.10	368.20	19.51	< .001	<i>ns.</i>
Absorption	266.01	278.37	349.41	12.72	.002	<i>ns.</i>
Visual Imagery	263.72	283.81	322.09	5.14	<i>ns.</i>	<i>ns.</i>
Amount of Imagery	266.62	283.56	316.96	3.24	<i>ns.</i>	<i>ns.</i>
Vividness of Imagery	263.57	285.13	314.53	6.21	<i>ns.</i>	<i>ns.</i>
Self-Awareness	362.06	270.82	175.70	74.95	< .001	.042
Altered State of Awareness	203.57	293.56	400.84	88.33	< .001	.001
Arousal	315.62	281.15	219.71	12.82	.002	.030
Rationality	350.89	268.86	212.90	30.77	< .001	.005
Volitional Control	344.76	275.77	185.54	52.19	< .001	.021
Memory	339.00	270.98	227.30	30.27	< .001	<i>ns.</i>
Internal Dialogue	202.90	293.17	404.69	7.37	<i>ns.</i>	<i>ns.</i>

Note. ^aSignificance levels are adjusted for Holm-Bonferroni criteria.

Previous findings in the literature also suggest that dimensions of phenomenology of consciousness and archaic involvement are related. We can expect that positive emotions experienced in hypnosis will be significantly associated with the positive feelings towards the hypnotist, while negative feelings under hypnosis, in general, may be related to those toward the hypnotist. As demonstrated by data in Section 6.6 on AIM and in Section 6.7 on PCI, both measures—in the entire sample—are charged with a “hypnotist effect”, which we should take in consideration in further analyses. To check whether this effect influences the relationship between AIM and PCI scales, **Table 46** consists of two sets of correlation coefficients. In each cell, the upper value is the raw correlation, while the lower number is partial correlation which is controlled for the hypnotist. If we compare these data sets, it becomes obvious that the association between archaic involvement and phenomenology was practically not affected by who the experimenter was (at least in this sample, with 6 hypnotists).

Table 46 | Correlations between Archaic Involvement Measure and Phenomenology of Consciousness Inventory without (regular letters) and with controlling for the hypnotist (*italic letters*)

	AIM+	AIM–	AIM Admira- tion and Bonding	AIM Fear of Negative Appraisal	AIM Need for Depend- ence
PCI Dissociative Control	.56* <i>.58*</i>	.10 <i>.10</i>	.63* <i>.64*</i>	.21* <i>.22*</i>	.48* <i>.49*</i>
PCI Positive Affect	.48* <i>.48*</i>	.05 <i>.05</i>	.54* <i>.54*</i>	.20* <i>.20*</i>	.37* <i>.37*</i>
PCI Negative Affect	.11 <i>.11</i>	.31* <i>.31*</i>	.02 <i>.02</i>	.22* <i>.22*</i>	.08 <i>.07</i>
PCI Visual Imagery	.12 <i>.12</i>	.03 <i>.03</i>	.19* <i>.19*</i>	–.05 <i>–.06</i>	.09 <i>.09</i>
PCI Attention to Internal Processes	.49* <i>.50*</i>	.08 <i>.08</i>	.53* <i>.53*</i>	.20* <i>.20*</i>	.46* <i>.46*</i>

Note. Significance levels are adjusted for Holm-Bonferroni criteria. For better readability, significant correlations are printed in **bold letters**. * p (adjusted) < .001. All correlations higher than .10 have a statistical power exceeding .80.

As expected, positive transference was associated with a general positive experience of hypnosis; the same relationship was observed for negative emotions. Dissociative propensity was strongly associated with admiration and bonding, and with fear of negative appraisal. Positive experiences and attention to internal processes also showed a similar strength of association with transference. Although from correlations we cannot make deductions on causal pathways, it seems logical that the perceived “goodness” of the hypnotist makes it easier to be absorbed in the hypnotic state and to feel positive about it; also, those who have better capacity to monitor their internal worlds will have more access to feelings towards the hypnotist.

7.3. Summary

The above presented findings show that those measures which were thought to tap into related areas—within the broader concept of mentalization—seem not to be related. Maybe different measures are needed to get a grip on the phenomenon of mentalization. Although the scientific investigation of the phenomena related to mentalization began in the 1990s, it still does not have such a well-scrutinized and psychometrically sound measure as hypnotic responsiveness. Further steps have to be taken to select and establish measures of mentalization that show sufficient convergent validity. In contrast, behavioral, emotional, and phenomenological aspects of hypnotic response, in line with previous findings and the proven validity and reliability of the frequently used measures, demonstrated high levels of convergent validity, but also adequate discrimination within the broader concept of hypnotic response. In the next chapter, we will examine if mentalization skills have any influence on hypnotic susceptibility.

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8. MENTALIZATION SKILLS AND HYPNOTIC RESPONSE

FINALLY, WE HAVE ARRIVED to one of the entirely novel aspects of the present research project. In this chapter, we will check if the previously examined mentalization skills have any effect on the building blocks of hypnotic responsiveness. These analyses will answer **Research Questions 3, 4 and 5** (on whether behavioral, emotional and phenomenological dimensions of hypnotic responding are related to mentalizing skills). Since I hypothesize that they do, hereby not only correlational analyses, but linear and nonlinear regressions will also be presented. To the best of my knowledge, neither reading the mind in the eyes, nor alexithymia has been studied for their associations with hypnotic response. The present results on the relationship between HGSHS:A scores and ECS will be compared to data obtained by [Cardeña et al. \(2009\)](#). Multiple regression models are frequently used in hypnosis research. [Lichtenberg et al. \(2004\)](#) found that the personality trait persistence, the variation of COMT gene, propensity for absorption, and moderately focused attention explained 44% of the variance in hypnotizability (assessed by SHSS:C) in women and 29% in men. [Geiger et al. \(2014\)](#) observed that in adolescents, intelligence and gender account for 4 to 6% variation in hypnotic susceptibility (as measured by HGSHS:A). Although mentalization skills cannot directly be compared to these predictor variables, we may expect that they will have a similar explanative power for the variation in hypnotic response. It can also be expected that mentalization skills will explain a larger part of variance in outcome variables that measure the emotional experience of hypnosis (i.e., AIM and PCI-5 Positive and Negative Affect) than when outcome measures indicate behavioral hypnotizability (HGSHS:A) or phenomenology of dissociation (PCI-5 Dissociative Control, Attention to Internal Processes, Imagery).

8.1. Correlations

In **Hypothesis 3a**, I expected hypnotic susceptibility (the behavioral dimension of hypnotic responsiveness) to be associated with the facets of mentalization. RMET scores showed no significant correlation with measures of hypnotic response, either in the entire sample ($n = 360$, $-.04 \leq r \leq .07$, $.19 \leq p \leq .92$), or among females ($n = 209$, $-.04 \leq r \leq .04$, $.25 \leq p \leq .97$). In the male subsample consisting of 151 men, association of RMET score and AIM– was $r = -.16$, $p = .047$, but from the 12 (in total, 36) correlations, its significance can be attributed to the inflated Type I Error (correlations were not adjusted for Holm-Bonferroni criteria). Other correlations in the male sample, similar to those in females and in the entire sample, were marginal. In sum, we can say that RMET and behavioral hypnotizability essentially lack correlation.

ECS (including positive, negative, and total scores) and HGSHS:A scores in the entire sample showed significant, although not too large correlations (**Table 47**). Association of HGSHS:A scores and ECS Positive was very similar to that observed by [Cardeña et al. \(2009\)](#). While they observed higher correlation between HGSHS:A self-scores and ECS Total than in the present sample, their extent is not essentially different ($z = -1.9$, $p = .06$), and the same is true of ECS Negative scores ($z = -1.01$, $p = .31$). Correlations in the subsamples of male and female Ss were not significant.

Table 47 | Correlations between ECS and HGSHS:A in the present sample and in [Cardeña et al. \(2009\)](#)

	ECS Total	ECS Positive	ECS Negative
HGSHS:A Observer-score in the present sample (N = 362)	.15 $p = .004$	.18 $p = .001$	.21 $p < .001$
HGSHS:A Self-score in the present sample (N = 362)	.16 $p = .002$	.18 $p = .001$	.22 $p < .001$
HGSHS:A Self-score in Cardeña et al. (2009) (N = 161)	.33 $p < .001$	.19 $p < .01$	.31 $p < .001$

Note. Significance levels are adjusted for Holm-Bonferroni criteria. The statistical power of all correlations observed in the present sample exceeds .88.

In **Hypothesis 4**, I expected Associations between ECS and AIM, as you can read from **Table 48**, were also rather mediocre (no significant correlations for males; either between ECS and AIM Negative, or AIM Fear of Negative Evaluation). Still, in both the entire sample and among women, ECS Positive and ECS Negative showed a small (r between .23 and .28) correlation with archaic involvement, showing that emotional contagion and positive transference towards the hypnotist are somewhat related.

Table 48 | Correlations between ECS and AIM Positive, AIM Admiration and Bonding, and AIM Need for Dependence

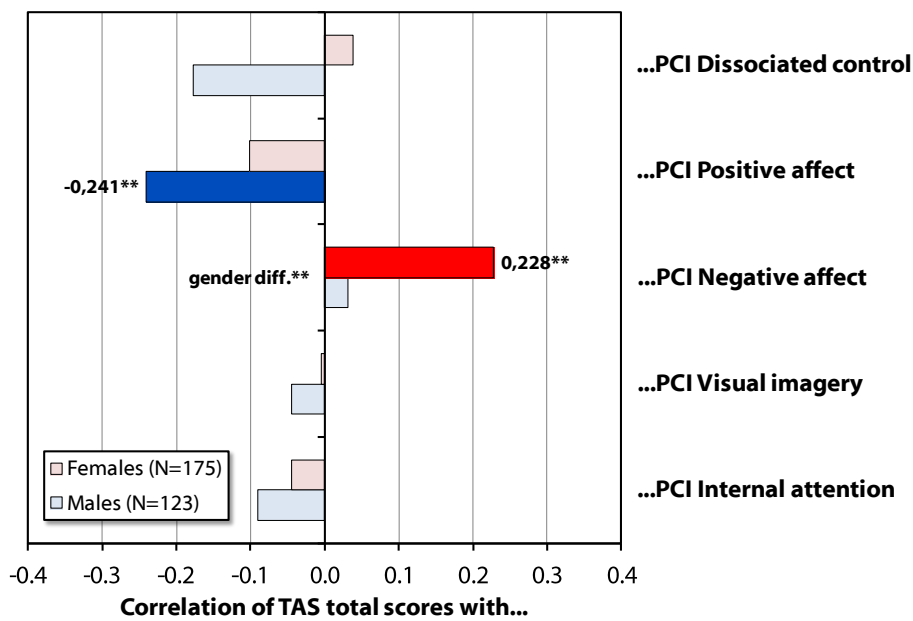
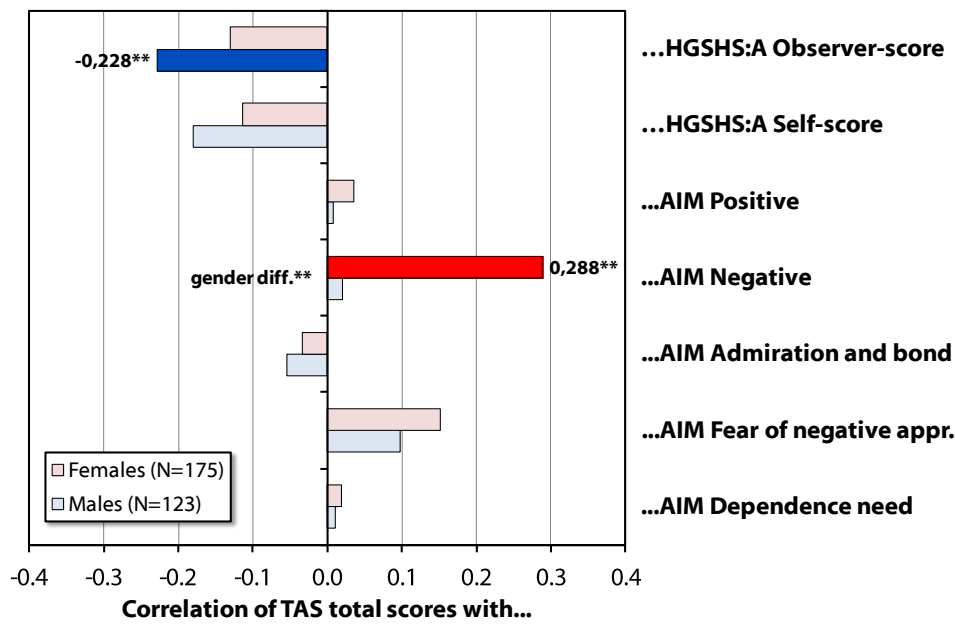
	Entire sample ($N=362$)			Females ($n=209$)		
	ECS Total	ECS Positive	ECS Negative	ECS Total	ECS Positive	ECS Negative
AIM+	.16 <i>ns.</i>	.25*	.27*	.16 <i>ns.</i>	.26*	.28*
AIM Admiration and Bonding	.23*	.21*	.27*	.23*	.22*	.28*
AIM Need for Dependence	.10 <i>ns.</i>	.24*	.23*	.10 <i>ns.</i>	.27*	.26*

Note. * $p < .001$. For AIM Negative and AIM Fear of Negative Appraisal, no significant correlations were found, neither in the male subsample. Significance levels are adjusted for Holm-Bonferroni criteria. The statistical power of all significant correlations exceeds .90.

In **Hypothesis 5**, I expected a positive association between mentalizing skills and positive phenomenological experiences (and experiences of ASC in general). Following Holm-Bonferroni adjustment, only four correlations were found to be significant between measures of emotional contagion and subscales of PCI (5-factor solution), all of them in the entire sample. These were between Dissociative Control and ECS Negative ($r = .17, p = .001, \text{power} = .95$), Negative Affect and ECS Negative ($r = .20, p < .001, \text{power} = .98$), Attention to Internal Processes and ECS Negative ($r = .17, p = .001, \text{power} = .95$), and Attention to Internal Processes and ECS Positive ($r = .20, p < .001, \text{power} = .98$). These results indicate that there is a small, albeit significant link among dissociation, negative feelings about hypnosis, inward attention and emotional contagion.

Linear correlations between measures of hypnotic response and TAS-20 are depicted in **Figures 24a–b**. TAS-20 scores in general do not seem to be strongly associated with measures of hypnotic susceptibility, although some remarkable gender differences can be observed. Among males, there is a small-medium significant negative correlation between alexithymia and HGSHS:A observer-score. To a smaller (non-significant) extent, it can also be found in females. Females, in turn, show a significant positive association between alexithymia scores and negative emotions towards the hypnotist. In males, the same effect was not detected ($z = -1.69, p = .05$). In the lower chart, negative and positive emotions in hypnotic state seem to be associated with alexithymia, again. To a small extent, with alexithymia scores increasing, males feel significantly less positive, while females feel significantly more negative about hypnosis. In the latter effect, the gender difference is significant: $z = -2.32, p = .02$.

When looking at TAS-20 subscales, a similarly sparse and scattered pattern was observed. Following Holm-Bonferroni adjustment, the following correlations proved to be significant (and yielding a statistical power higher than .80): In males, HGSHS:A observer-scores negatively correlated with Difficulty in Describing Emotions ($r = -.26, p = .004$) and with Pragmatic Thinking ($r = -.24, p = .007$); the latter was also associated with Harvard self-scores ($r = -.26, p = .004$), showing that higher alexithymia scores, to a small-medium effect, was associated with lower hypnotizability scores. In the entire sample, AIM– scores were associated with Difficulty in Identifying Feelings ($r = .27, p < .001$); the same pattern emerged in female Ss ($r = .39, p < .001$), indicating that to a medium extent, those for whom it is difficult to identify their feelings will feel more negatively about the hypnotist. TAS-20 Pragmatic Thinking was negatively correlated with PCI-5 Positive Affect in the entire sample ($r = -.22, p < .001$) and in males ($r = -.31, p < .001$). Difficulty in Identifying Feelings correlated with PCI-5 Negative Affect ($r = .26, p < .001$). Finally, a negative correlation between Pragmatic Thinking and PCI-5 Attention to Internal Processes was observed in the entire sample ($r = -.22, p < .001$) and among males ($r = -.30, p = .001$).



Figures 24a–b | Linear correlations between TAS-20 Total scores and measures of hypnotic response

The above presented findings suggest in general, that there is a small sized, but significant pattern of association between measures of hypnotic response and mentalization skills. They show certain gender differences, and, in line with our expectations, emerge mostly around the emotional evaluation of the hypnotic state and the relationship to the hypnotist.

8.2. Multiple Linear Regression Analyses

In the previous chapters we saw that age and gender may also influence the relationship between mentalization skills and hypnotic susceptibility. The best way to check whether mentalization and these variables influence hypnotic response is multiple linear regression analysis. To a smaller extent, variables such as the person of the hypnotist and the profession of the subjects also played a

role; this effect, however, can be attributed to the extreme responses to hypnosis by psychology students who were hypnotized by their teacher (E.E.), which is probably a “special” relationship from the perspective of transference. Teachers can evoke feelings of transference with similar strength and emotional complexion as hypnotists ([Bányai et al., 2001](#)). Since the measures of mentalization were filled out by much less Ss than in the whole sample I think the experimenter effect may not play a role in the association between their mentalization skills and hypnotic responses. The effect may be reduced by the fact that just a few psychology student—hypnotized by their teacher, E.E.—filled in the questionnaires. The age and gender of the Ss, and whether they were psychologists or not, were included in the above presented regression models as possible predictor variables.

Techniques of multiple regression analysis are sensitive to the violation of some assumptions ([A. Field, 2009](#)). These include:

- The predictor variables should be *quantitative* (continuous) or *binary*. This is one of the reasons why the hypnotist variable is not used in the above models²⁷.
- Predictors should *not demonstrate multicollinearity*, i.e. they must not be strongly correlated. Multicollinearity in the present analyses was checked with the variance inflation factor and its reciprocal value, called tolerance statistic. No tolerance statistics were below 0.2 which would indicate possible multicollinearity. (The stepwise method I used also warranted that SPSS will include only properly independent predictors.)
- Predictors *cannot be correlated with external variables*. In the case of mentalization skills, it simply cannot be ruled out—if nothing else, we hypothesize that they are correlated with parental rearing style. In the next chapters we will address this question. Now we must accept that the violation of this criterion lowers the generalizability of the results. (It is worthy to note that such a criterion, actually, can never be fulfilled in psychological investigations, because most of personal variables are all related to each other.)
- Predictors shall be *homoscedastic*, meaning that the variances of their residual terms are constant. This was checked by visual analysis of plots of standardized residuals against standardized predicted value (not presented here). The assumption of homoscedasticity was met in all cases.
- Between any randomly selected two observations, the error terms should be uncorrelated. In other words, there is no autocorrelation in the data. This is indicated by the Durbin-Watson statistics, which is, in ideal cases, not essentially different from 2.
- About outliers, statisticians do not have a uniform opinion. Although outliers may severely lower regression, their omission means that we cannot make assumptions about the whole sample; and actually, from any sample that has more than two Ss, we can always exclude the outliers. A regression model can be accepted if the vast majority (over 99%) of the standardized residuals is within ± 2.5 , which was the case for the present analyses.

Let us now see whether variables of hypnotic response can be predicted by mentalizing abilities. I have built multiple regression models to test this hypothesis, with HGSHS:A, AIM, and PCI-5 scores as dependent (outcome) variables, and age of Ss, gender of Ss, profession (psychology versus non-psychology) of Ss, and RMET, ECS, and TAS-20 scores as possible predictors. We have seen that there are adequate levels of intercorrelation between a measure’s subscales and lower but still significant correlation between the measures. If they enter into a regression model together, will they not violate assumption of multicollinearity? Certainly they can, but SPSS offers an entering technique, the “stepwise” method, which takes multicollinear predictors in account. It automatically includes and excludes predictors based on their usefulness (i.e., how much it contributes to the explanation of the outcome variable) and by the *correlations* between predictors: No new pre-

²⁷ Another problem with the hypnotist variable is its measurement level. Regression models cannot handle ordinal variables like the person of the hypnotist, which includes a few values (each hypnotists), but the numerical difference between them is not meaningful. As regression models treat binary variables (like gender or “psy versus non-psy”) as a categorical variable with two possible categories (0 and 1). The hypnotist effect could have been built into the models with transforming them into so-called “dummy” variables, but for 6 hypnotists it had meant 5 extra dummy options, which would have made the models unnecessarily complicated.

dictor will be entered into the model which shows too high correlation with the others. Variance inflation factors and tolerance statistics also warrant the lack of multicollinearity.

In the following pages, you can see the multiple regressions conducted to check if mentalization abilities explain any variance in the hypnotic responses. The tables consist of five blocks. From left to right, the first block summarizes the models the stepwise regression analyses have found to be significant. The second block presents unstandardized regression coefficient (B) and its standard error, and the standardized coefficient (beta). Standardized coefficients show how many standard deviations the outcome variable changes with each standard deviation increase in the respective predictor variable. Within one model, the beta values can be compared to each other to see which predictor has the largest effect on the outcome variable. The third block, "Contributions" show if the given beta is significant; adjusted R^2 values, printed in bold, express how much variability of the outcome variable is explained by the respective predictor variables together. The fourth block indicates how model building increased the goodness (of fit) of the regression; it also includes the statistical power of the given model. The last column contains Durbin-Watson statistic, which indicates if there is any autocorrelation in the data.

Tables 49 and 50 are very similar, showing that from the variability of HGSHS:A observer- and self-scores, TAS-20 Difficulty in Identifying Feelings subscale, and ECS Total together explain 6% and 5% for observer-scores and self-scores, respectively. This small effect is comparable with that of gender and that of intelligence on HGSHS:A (Geiger et al., 2014).

As **Table 51** shows, the 7.5% of positive transference towards the hypnotist can be explained by general emotional contagion, age and difficulty in identifying feelings. From the beta values we can conclude that emotional contagion plays a greater role than the other two variables. The effect size is small. TAS-20 Difficulty in Identifying Feelings scores, age, and being (or not being) a psychologist accounted for 11% of the variation of negative transference (AIM-) (**Table 52**). Those who have hardship in accessing their emotions, who are younger, and/or who are non-psychologists, express slightly higher negative archaic involvement. The f^2 value suggests that the effect is medium-sized. AIM Admiration and Bonding does not have much to do with measures of mentalization, although its 4% is explained by ECS total scores; the effect is small (**Table 53**). Variability of AIM Fear of Negative Appraisal subscale is explained by Age and TAS-20 Difficulty in Identifying Feelings scores to 8% (**Table 54**). To a small extent, older Ss and those for whom it is harder to access their emotions expressed more fear that the hypnotist would not be pleased with them.

As **Table 55** demonstrates, the age of the Ss and the difficulty they perceived in identifying their feelings accounted for 8% of the variation in their PCI-5 Dissociative Control scores: Older Ss with lower alexithymia scores experienced slightly more dissociation during hypnosis. For PCI-5 Positive Affect, just like for AIM Admiration and Bonding, the investigated measures of mentalization skills did not seem to exert a great influence. Nevertheless, 4% variation in the positive experiences under hypnosis can be explained by TAS-20 Pragmatic Thinking scores. To a small degree, the more someone's cognitive style is bound to external stimuli and practical details, the less positive s/he will feel about hypnosis (**Table 56**). PCI-5 Negative Affect, on the contrary, seems to be largely influenced by mentalizing skills (**Table 57**): Almost 17% of its variability was explained by difficulty in identifying feelings, belonging (or not) to psychologists, and propensity for negative and positive emotional contagion. The f^2 value indicated a medium-high effect. To such a degree, those who have hardship in accessing their emotions, who are not psychologists, who are more prone to automatically mimic negative emotions, and who are *less* prone to mimic positive emotions, felt more negative about hypnosis. It is interesting that both positive and negative subscales of ECS were entered in the final model. The variance inflation factor and the tolerance statistic (all values around 1), however, did not suggest that they are multicollinear. As no hypothesized predictor variables were found to be significantly associated with PCI-5 Visual Imagery, no regression analysis was conducted to check if mentalization affects imagery under hypnosis. For PCI-5 Attention to Internal Processes, it took 5 steps to build the final regression model. As you can see in **Table 58**, TAS-20 Pragmatic Thinking was a predictor with some explanative power, but it was excluded from the final model. After all, 12% of the variation of inward attention under hypnosis can be explained by difficulty in identifying feelings, alexithymia total scores, and age.

Table 49 | Multiple regression analysis: The influence of mentalization skills on HGSHS:A Observer-scores ($N= 237$)

Predictor Variables	Coefficients			Contributions			Comparison of Models				Durbin-Watson
	<i>B</i>	<i>SE(B)</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>adj. R²</i>	ΔR^2	ΔF	ΔF sig.	power	
Model 1: $F(1, 235) = 8.44, p = .004, f^2 = .032$											
Constant	7.23	0.52		13.72	< .001						
TAS Difficulty in Identifying Feelings	-0.12	0.04	-.19	-2.09	.004	.031	.031	8.44	.004	.78	
Model 2: $F(2, 234) = 7.99, p < .001, f^2 = .059$											
Constant	5.14	0.93		5.51	< .001						
TAS Difficulty in Identifying Feelings	-0.11	0.04	-.17	-2.72	.007						
ECS Total	1.08	0.40	.17	-2.70	.007	.056	.025	7.30	.007	.92	2.23

The table shows that TAS-20 Difficulty in Identifying Feelings and ECS Total scores explain 5.6% variance in HGSHS:A Observer-scores.

Table 50 | Multiple regression analysis: The influence of mentalization skills on HGSHS:A Self-scores ($N= 237$)

Predictor Variables	Coefficients			Contributions			Comparison of Models				Durbin-Watson
	<i>B</i>	<i>SE(B)</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>adj. R²</i>	ΔR^2	ΔF	ΔF sig.	power	
Model 1: $F(1, 235) = 8.76, p = .003, f^2 = .033$											
Constant	3.47	0.80		4.14	< .001						
TAS Difficulty in Identifying Feelings	1.26	0.43	-.19	2.96	.003	.032	.032	8.76	.003	.80	
Model 2: $F(2, 234) = 7.01, p = .001, f^2 = .051$											
Constant	4.80	0.99		4.85	< .001						
TAS Difficulty in Identifying Feelings	1.19	0.43	-.18	2.80	.006						
ECS Total	-0.99	0.04	.14	-2.26	.025	.049	.017	5.11	.025	.88	2.21

The table shows that TAS-20 Difficulty in Identifying Feelings and ECS Total scores explain 4.9% variance in HGSHS:A Self-scores.

Table 51 | Multiple regression analysis: The influence of mentalization skills on AIM Positive ($N= 237$)

Predictor Variables	Coefficients			Contributions			Comparison of Models				Durbin-Watson
	<i>B</i>	<i>SE(B)</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>adj. R²</i>	ΔR^2	ΔF	ΔF sig.	power	
Model 1: $F(1, 235) = 10.49, p = .001, f^2 = .041$											
Constant	36.91	6.35		5.81	< .001						
ECS Total	10.94	3.38	.21	3.24	.001	.039	.039	10.49	.043	.87	
Model 2: $F(2, 234) = 8.83, p < .001, f^2 = .066$											
Constant	44.71	6.94		6.44	< .001						
ECS Total	12.32	3.38	.23	3.65	< .001						
Age	-0.37	0.14	-.17	-2.63	.009	.062	.023	6.91	.009	.95	
Model 3: $F(3, 233) = 7.37, p < .001, f^2 = .081$											
Constant	36.57	7.95		4.60	< .001						
ECS Total	10.71	3.45	.20	3.11	.002						
Age	-0.32	0.14	-.14	-2.26	.025						
TAS Difficulty in Identifying Feelings	0.52	0.25	.13	2.05	.041	.075	.015	4.21	.041	.97	2.06

The table shows that ECS Total score, age and TAS-20 Difficulty in Identifying Feelings scores explain 7.5% variance in AIM Positive scores.

Table 52 | Multiple regression analysis: The influence of mentalization skills on AIM Negative ($N=237$)

Predictor Variables	Coefficients			Contributions			Comparison of Models				Durbin-Watson
	<i>B</i>	<i>SE(B)</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>adj. R²</i>	ΔR^2	ΔF	ΔF sig.	power	
Model 1: $F(1, 235) = 18.20, p < .001, f^2 = .073$											
Constant	2.91	2.91		4.00	< .001						
TAS Difficulty in Identifying Feelings	0.16	0.16	.27	4.27	< .001	.068	.068	18.20	< .001	.96	
Model 2: $F(2, 234) = 13.84, p < .001, f^2 = .110$											
Constant	4.93	4.93		5.00	< .001						
TAS Difficulty in Identifying Feelings	0.14	0.14	.24	3.90	< .001						
Age	-.06	-0.06	-.19	-2.98	.003	.098	.030	8.89	.003	> .99	
Model 3: $F(3, 233) = 10.71, p < .001, f^2 = .123$											
Constant	4.37	4.37		4.29	< .001						
TAS Difficulty in Identifying Feelings	0.13	0.13	.23	3.61	< .001						
Age	-.07	-0.7	-.22	-3.38	.001						
Psy or Non-Psy	1.20	1.19	.13	2.02	.044	.110	.012	4.09	.044	> .99	2.00

The table shows that TAS-20 Difficulty in Identifying Feelings, age and profession (being or not being psychologist) explain 11% variance of AIM Negative scores.

Table 53 | Simple regression analysis: The influence of mentalization skills on AIM Admiration and Bonding ($N=237$)

Predictor Variables	Coefficients			Contributions			Comparison of Models				Durbin-Watson
	<i>B</i>	<i>SE(B)</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>adj. R²</i>	ΔR^2	ΔF	ΔF sig.	power	
Model 1: $F(1, 235) = 10.79, p = .001, f^2 = .042$											
Constant	1.77	0.41		4.35	< .001						
ECS Total	0.71	0.22	.21	3.29	.001	.040	.040	10.79	.001	.87	1.97

The table shows that ECS Total scores explain 4% variance of AIM Admiration and Bonding scores.

Table 54 | Multiple regression analysis: The influence of mentalization skills on AIM Fear of Negative Appraisal ($N = 237$)

Predictor Variables	Coefficients			Contributions			Comparison of Models				Durbin-Watson
	<i>B</i>	<i>SE(B)</i>	<i>Beta</i>	<i>t</i>	sig.	<i>adj. R</i> ²	ΔR^2	ΔF	ΔF sig.	power	
Model 1: $F(1, 235) = 12.65, p < .001, f^2 = .049$											
Constant	3.39	0.26		13.20	< .001						
Age	-.03	0.01	-.23	-3.56	< .001	.047	.047	12.65	< .001	.93	
Model 2: $F(2, 234) = 10.85, p < .001, f^2 = .083$											
Constant	2.45	0.41		6.04	< .001						
Age	-.03	0.01	-.20	-3.19	.002						
TAS Difficulty in Identifying Feelings	.05	0.01	.19	2.94	.004	.077	.030	8.64	.004	> .99	2.10

The table shows that age and TAS-20 Difficulty in Identifying scores explain 7.7% variance of AIM Fear of Negative Appraisal scores.

Table 55 | Multiple regression analysis: The influence of mentalization skills on PCI-5 Dissociative Control ($N = 237$)

Predictor Variables	Coefficients			Contributions			Comparison of Models				Durbin-Watson
	<i>B</i>	<i>SE(B)</i>	<i>Beta</i>	<i>t</i>	sig.	<i>adj. R</i> ²	ΔR^2	ΔF	ΔF sig.	power	
Model 1: $F(1, 235) = 7.07, p = .008, f^2 = .025$											
Constant	-2.21	0.81		-2.73	.007						
Age	0.11	0.04	.17	2.66	.008	.025	.025	7.07	.008	.68	
Model 2: $F(2, 234) = 10.93, p < .001, f^2 = .084$											
Constant	0.47	1.06		0.44	.657						
Age	0.30	0.06	.47	4.67	< .001						
TAS Difficulty in Identifying Feelings	-0.14	0.04	-.38	-3.79	< .001	.078	.053	14.382	< .001	> .99	2.15

The table shows that age and TAS-20 Difficulty in Identifying scores explain 7.8% variance of PCI-5 Dissociative Control scores.

Table 56 | Simple regression analysis: The influence of mentalization skills on PCI-5 Positive Affect ($N = 237$)

Predictor Variables	Coefficients			Contributions			Comparison of Models				Durbin-Watson
	<i>B</i>	<i>SE(B)</i>	<i>Beta</i>	<i>t</i>	sig.	<i>adj. R</i> ²	ΔR^2	ΔF	ΔF sig.	power	
Model 1: $F(1, 235) = 11.31, p = .001, f^2 = .044$											
Constant	1.72	0.56		3.09	.002						
TAS Pragmatic Thinking	-0.13	0.04	-.21	-3.36	.001	.042	.042	11.31	.001	.84	2.10

The table shows that age and TAS-20 Pragmatic Thinking scores explain 4.2% variance of PCI-5 Positive Affect scores.

Table 57 | Multiple regression analysis: The influence of mentalization skills on PCI-5 Negative Affect ($N=237$)

Predictor Variables	Coefficients			Contributions			Comparison of Models				Durbin-Watson
	<i>B</i>	<i>SE(B)</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>adj. R²</i>	ΔR^2	ΔF	ΔF sig.	power	
Model 1: $F(1, 235) = 20.87, p < .001, f^2 = .085$											
Constant	-1.60	0.38		-4.19	< .001						
TAS Difficulty in Identifying Feelings	0.09	0.02	.29	4.57	< .001	.078	.078	20.87	< .001	> .99	
Model 2: $F(2, 234) = 18.59, p < .001, f^2 = .149$											
Constant	-0.75	0.43		-1.73	.085						
TAS Difficulty in Identifying Feelings	0.10	0.02	.31	5.09	< .001						
Psy or Non-Psy	-1.17	0.30	-.24	-3.88	< .001	.130	.052	15.06	< .001	> .99	
Model 3: $F(3, 233) = 14.53, p < .001, f^2 = .172$											
Constant	-1.34	0.49		-2.71	.007						
TAS Difficulty in Identifying Feelings	0.08	0.02	.27	4.29	< .001						
Psy or Non-Psy	-1.07	0.30	-.22	-3.58	< .001						
ECS Negative	0.49	0.20	.15	2.38	.018	.147	.017	5.66	.018	> .99	
Model 4: $F(4, 232) = 12.85, p < .001, f^2 = .200$											
Constant	-0.10	0.68		-0.14	.886						
TAS Difficulty in Identifying Feelings	0.10	0.02	.26	4.14	< .001						
Psy or Non-Psy	-1.11	0.30	-.23	-3.74	< .001						
ECS Negative	0.63	0.21	.19	2.99	.003						
ECS Positive	-0.61	0.23	-.16	-2.60	.010	.167	.020	6.73	.010	> .99	2.16

The table shows that TAS-20 Difficulty in Identifying Feelings scores, profession (being or not being psychologist), ECS Negative and ECS Positive scores explain 16.7% variance of PCI-5 Negative Affect scores.

Table 58 | Multiple regression analysis: The influence of mentalization skills on PCI-5 Attention to Internal Processes ($N=237$)

Predictor Variables	Coefficients			Contributions			Comparison of Models				Durbin-Watson
	<i>B</i>	<i>SE(B)</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>adj. R²</i>	ΔR^2	ΔF	ΔF sig.	power	
Model 1: $F(1, 235) = 11.08, p = .001, f^2 = .042$											
Constant	1.03	0.34		3.02	.003						
TAS Pragmatic Thinking	-0.08	0.02	-.21	-3.32	.001	.041	.041	11.08	.001	.87	
Model 2: $F(2, 234) = 9.80, p < .001, f^2 = .074$											
Constant	0.23	0.44		0.54	.590						
TAS Pragmatic Thinking	-0.08	0.02	-.22	-3.49	.001						
TAS Difficulty in Identifying Feelings	0.04	0.01	.18	2.86	.005	.069	.028	8.19	.005	.97	
Model 3: $F(3, 233) = 10.01, p < .001, f^2 = .114$											
Constant	0.24	0.43		0.56	.580						
TAS Pragmatic Thinking	0.04	0.04	.11	0.88	.382						
TAS Difficulty in Identifying Feelings	0.16	0.04	.64	4.00	< .001						
TAS Total Score	-0.08	0.03	-.61	-3.11	.002	.103	.034	9.70	.002	> .99	
Model 4: $F(4, 232) = 14.65, p < .001, f^2 = .116$											
Constant	0.37	0.40		0.94	.348						
TAS Difficulty in Identifying Feelings	0.13	0.02	.53	5.37	< .001						
TAS Total Score	-0.06	0.01	-.46	-4.64	< .001	.104	.001	0.77	.382	> .99	
Model 5: $F(4, 232) = 12.07, p < .001, f^2 = .140$											
Constant	1.07	0.48		2.22	.027						
TAS Difficulty in Identifying Feelings	0.12	0.02	.51	5.20	< .001						
TAS Total Score	-0.06	0.01	-.46	-4.70	< .001						
Age	-0.02	0.01	-.15	-2.50	.013	.123	.019	6.27	.013	> .99	2.08

The table shows that TAS-20 Difficulty in Identifying Feelings scores, TAS-20 total scores and age explain 12.3% variance of PCI-5 Attention to Internal Processes scores.

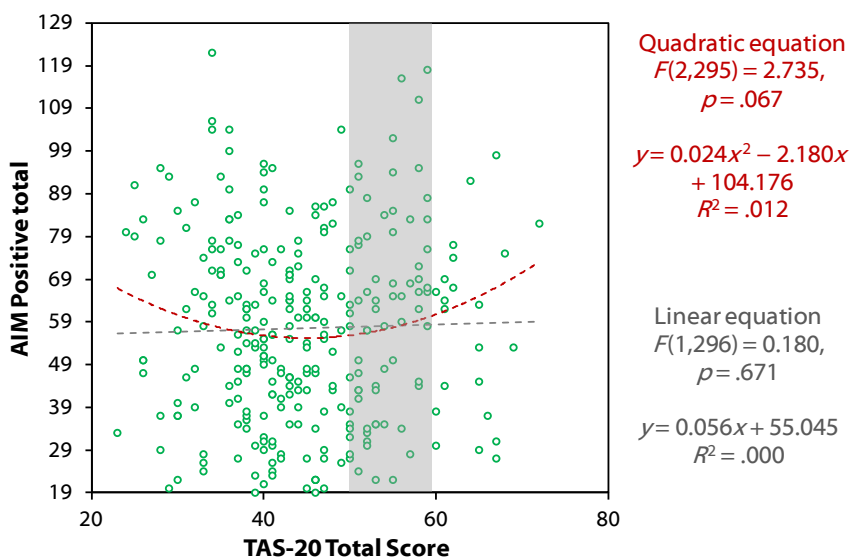
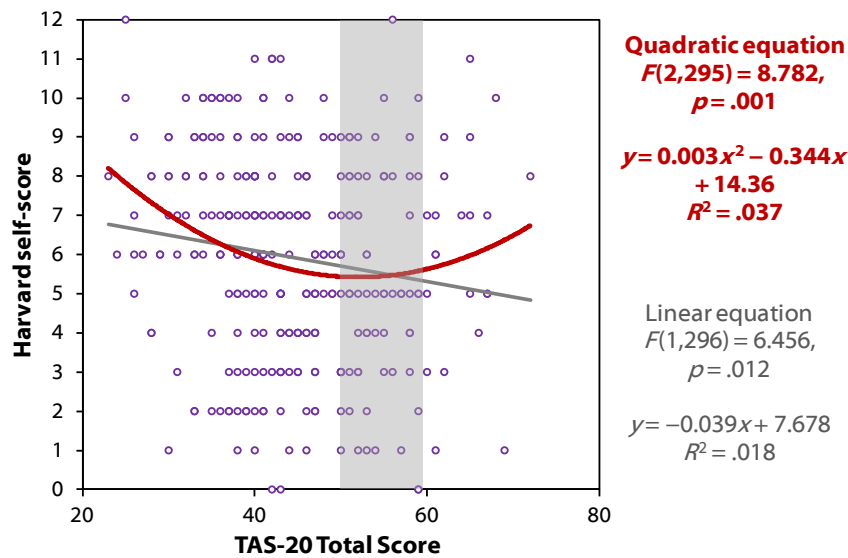
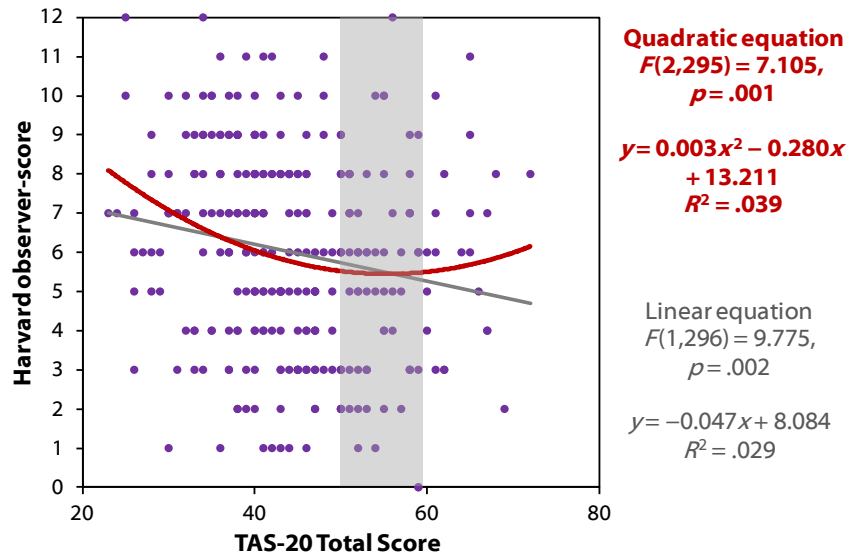
8.3. Nonlinear Regression: U-shaped Relationships between Alexithymia and Hypnotic Response

As mentioned in Section 4.1 on multiple and nonlinear regression in hypnosis research, we have good reasons to believe that alexithymia and hypnotic response not necessarily show a linear association, or a nonlinear (U-shaped) curve describes their association better than a line. This notion is the **Hypothesis 3b** of the present thesis. In other words, maybe it is not true that lower levels of alexithymia are associated with higher hypnotizability, but it is possible that sub-clinical alexithymics show the lowest hypnotizability, while alexithymics and non-alexithymics demonstrate higher hypnotic susceptibility. Note that it does not mean that such a quadratic regression and linear regression are mutually exclusive. If non-alexithymics show higher hypnotizability than non-alexithymics (but both groups perform better than sub-alexithymics), the linear model will also show significant association. It is the explained part of variance which will show a difference: the quadratic regression, in that case, will show higher R^2 values than that of the linear equation.

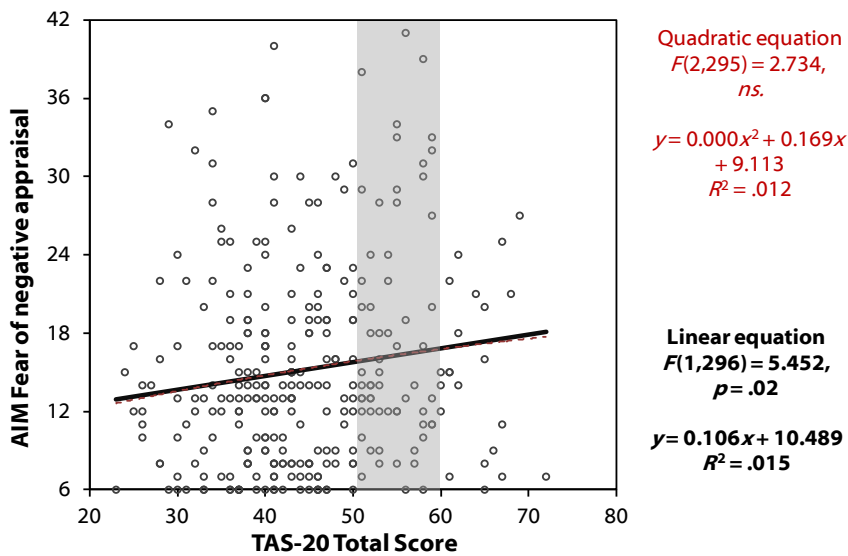
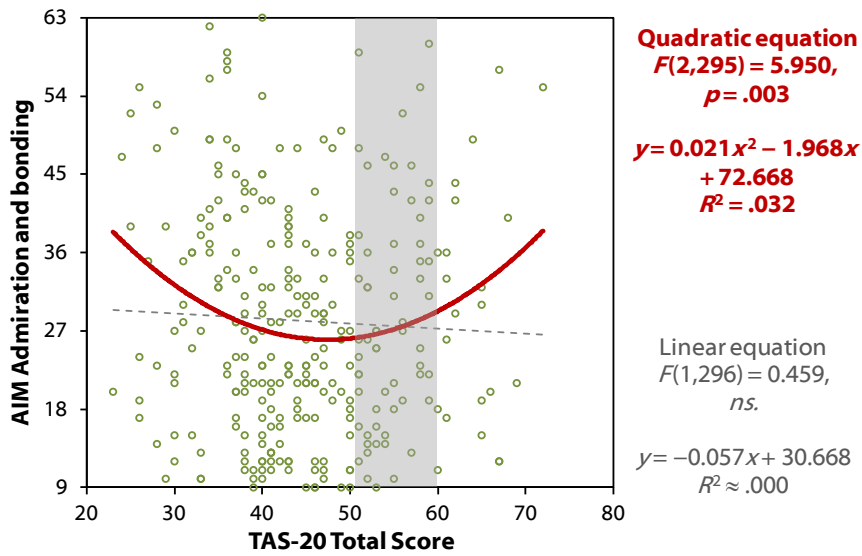
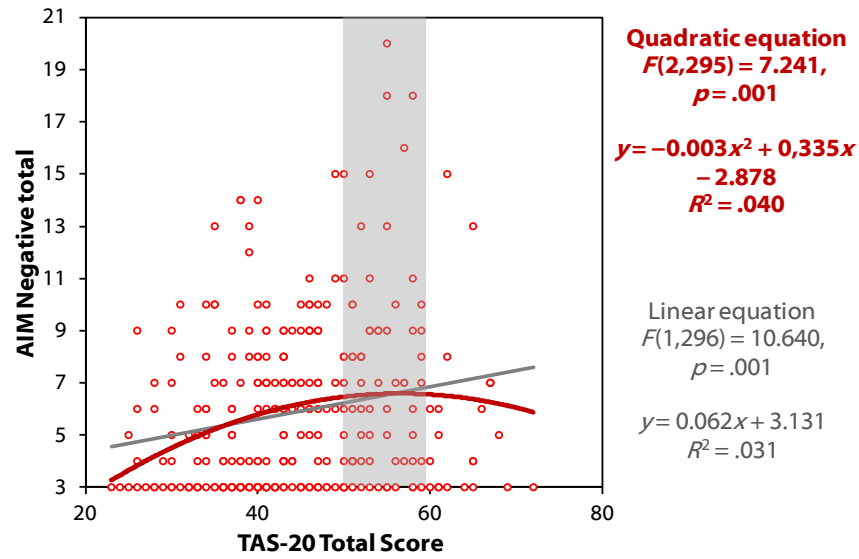
Therefore, we compared whether linear or nonlinear regression with TAS-20 total scores as predictor and measures of hypnotic response as outcome variables show a better fit (Költő, Varga, & Bányai, 2014; Költő & Bányai, 2015). The results can be seen in **Figures 25a–l**. As you can read from the diagram, applying quadratic regression (red curves) instead of linear equations (gray lines), in some cases, increased the shared variability of the predictor and the outcomes. Still, the increase in the R^2 rarely exceeded 2%. There were two exceptions in AIM Admiration and Bonding, where the quadratic regression improved 3.2% in the explained variability, suggesting that people in the range of sub-clinical alexithymia (marked with a vertical gray bar in the background) show significantly less admiration and emotional bond towards the hypnotist than either alexithymics or non-alexithymics; the same pattern emerged for PCI-5 Positive scores, suggesting that sub-clinical alexithymics experienced significantly less positive affect during hypnosis than the other two groups. In this case, the improvement was 5%; alexithymia, on its own, explained 7.5% of the variance from positive affects during hypnosis. In one case, linear regression gave a better explanation than quadratic one: the higher someone scored on TAS-20, the more s/he feared that the hypnotist will negatively evaluate her or him, although the shared variability was very small (1.5%). This finding should be treated with caution, because (as we have seen in **Table 21** on the proportion of Ss in each alexithymia groups) alexithymics are rather underrepresented in the present sample. Of the 298 Ss, only 15 females and 4 males crossed the TAS-20 cutoff score of 59 which indicates alexithymia. This also made gender comparisons impossible.

If alexithymia shows such a nonlinear association with hypnotic response, is it possible that reading the mind in the eyes and emotional contagion also have such an effect? I compared simple linear and quadratic regressions where ECS Total and RMET scores acted as predictors, and measures of hypnotic response as outcomes. The results were in line with those about multiple linear regressions I presented in the previous section. RMET scores had almost no traceable effect on hypnotic susceptibility, either linear ($R^2 > .01$ for all cases, $.16 \leq p \leq .92$) or nonlinear ($R^2 > .01$, $.11 \leq p \leq .78$). One exception was found: RMET scores had a nonlinear effect on PCI-5 Dissociated Control ($R^2 = .012$, $p = .04$), but this small effect can also be due to the inflated familywise Type I error. As we saw in the previous section, ECS Total scores played some part in the multiple regression analyses, which was supported by their individual effect on some dimensions on hypnotic response, both in linear ($.001 \leq R^2 \leq .072$, $.001 \leq p \leq .97$) and in nonlinear fashion ($.001 \leq R^2 \leq .070$, $.001 \leq p \leq .56$). The differences between the linear and quadratic regressions, however, did not reach even 1%, suggesting that between the propensity of emotional contagion and hypnotic response, nonlinear association gives no better explanation than the linear one does.

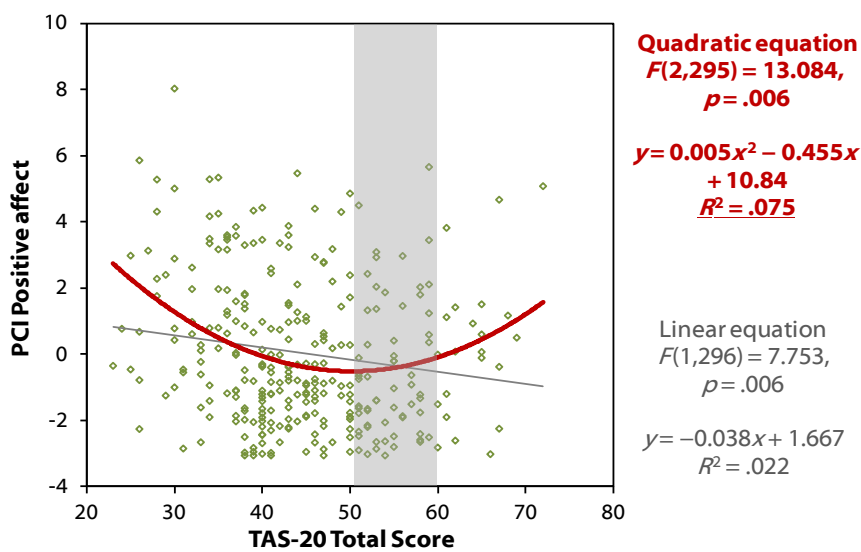
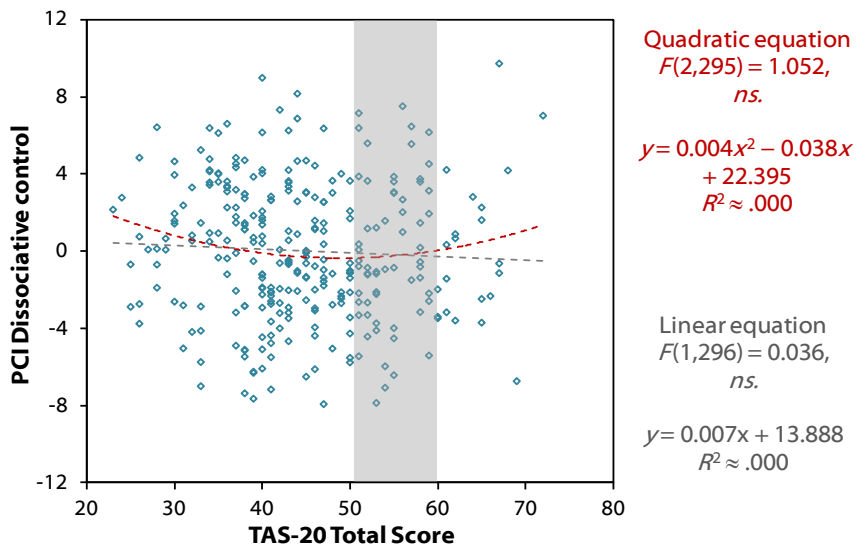
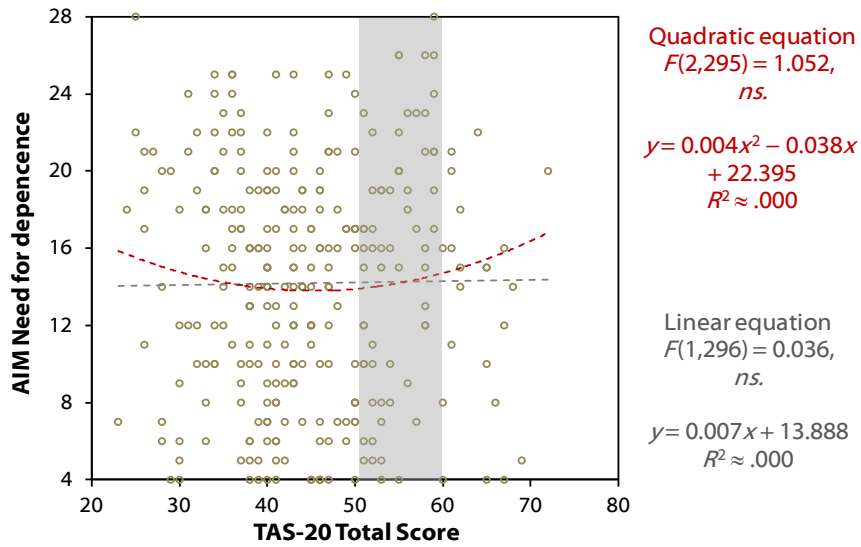
The integration of this non-linear association of alexithymia and hypnotizability into further analyses on mentalization skills and parental rearing is beyond the scope of the present thesis. Multiple nonlinear regression, which would have made it possible to uncover the effects of background variables and parental rearing style, requires special statistical skills and apparatus (i.e., it cannot be performed in SPSS). I found it important, nevertheless, to mention that alexithymia seems to have *both* a linear and a non-linear association with hypnotic response.



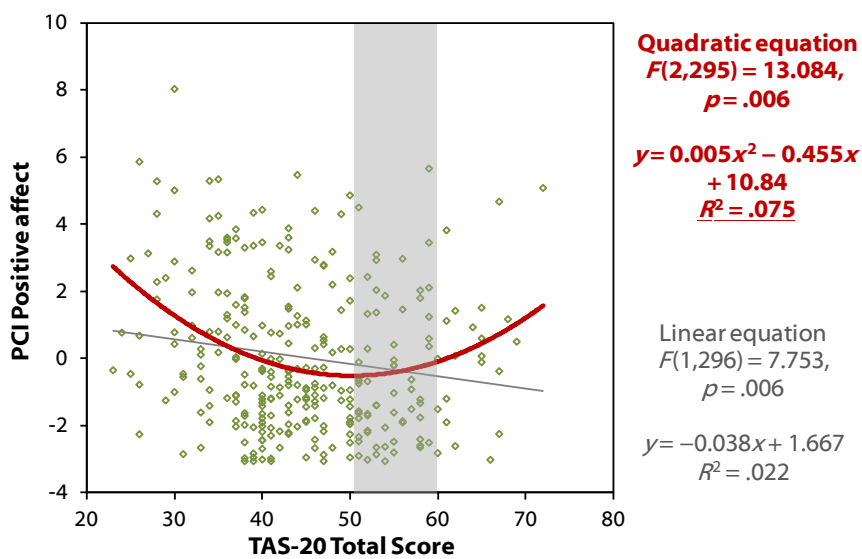
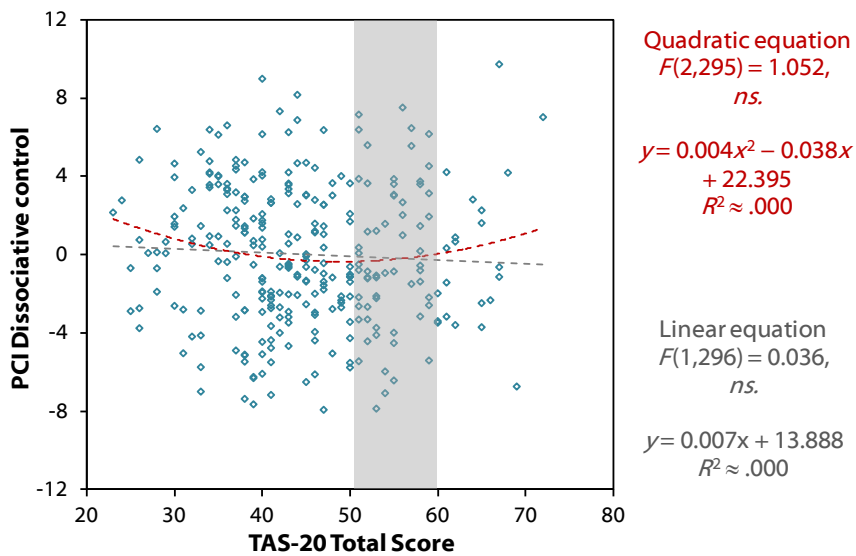
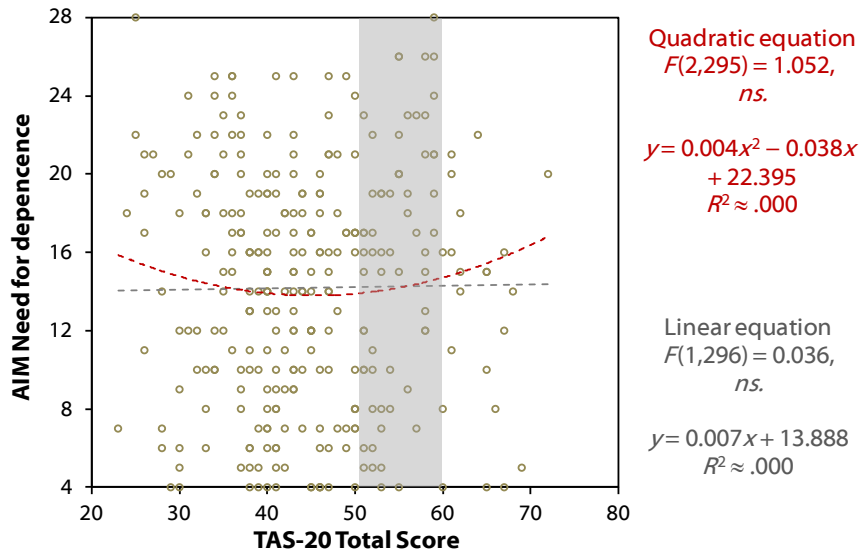
Figures 25a, b, c | Linear and quadratic regression: The effect of TAS-20 Total scores (predictor) on HGSHS:A Observer-scores, HGSHS:A Self-scores, and AIM Positive scores ($N = 298$)



Figures 25d, e, f | Linear and quadratic regression: The effect of TAS-20 Total scores (predictor) on AIM Negative scores, AIM Admiration and Bonding, And AIM Fear of Negative Appraisal ($N = 298$)



Figures 25g, h, i | Linear and quadratic regression: The effect of TAS-20 Total scores (predictor) on AIM Need for Dependence, PCI-5 Dissociative Control, and PCI-5 Positive Affect ($N = 298$)



Figures 25j, k, l | Linear and quadratic regression: The effect of TAS-20 Total scores (predictor) on PCI-5 Negative Affect, Visual Imagery and Attention to Internal Processes ($N = 298$)

8.4. Summary

A small but stable relationship was found between some mentalization skills and hypnotic responses. Contrary to our expectations, the ability to read the mind in the eyes entirely lacked an association with either the behavioral, emotional, or phenomenological dimension of hypnotic capacity.

Multiple linear and simple nonlinear regression analyses revealed a complex relationship between propensity for emotional contagion, alexithymic affective processing style, background variables including age and gender, and hypnotic response.

To mention the largest effects detected, TAS-20 Difficulty in Identifying Feelings, being (or not) a psychologist, and propensity for negative and positive aspect of emotional contagion shared 17% variance with the PCI-5 Negative Affect main scale. Those for whom it was hard to access their emotions, who were not psychologists, who were more susceptible to mimicking negative emotions, but refractory to positive emotions, felt more negative about the hypnotic state of consciousness. TAS-20 Difficulty in Identifying Feelings, TAS-20 Total Score (these two were checked for multicollinearity), and the subject's age accounted for 12% of the variability of PCI-5 Attention to Internal Processes. The standardized beta values, interestingly, showed that alexithymia total score and hardship in identifying feelings contributed to inward attention to hypnosis with similar strength, but in an opposite fashion. Those for whom it was more difficult to access their emotions, paid *more* attention to what was happening in them ($\beta = .51$), and at the same time, those who demonstrated higher alexithymia scores in general, paid *less* attention ($\beta = -.46$). This paradoxical pattern, in my opinion, shed some light on both the contradictory nature on alexithymia and on the hypnotherapeutic strategies we can use to ease alexithymia. This will be deliberated in the Discussion. The negative transference towards the hypnotist is also influenced by these factors: 11% of its variability was explained by (more) difficulty in identifying feelings, (younger) age and (not) being a psychologist. Difficulty in Identifying Feelings explained 8% of the variability of the fear that the hypnotist would negatively appraise the subject. The same factors also explained 8% of the variation in PCI Dissociative Control. To a smaller, but still significant extent, these factors also influenced HGSHS:A self- and observer-scores (5–6%) and admiration and bonding to the hypnotist (4%). TAS-20's Pragmatic Thinking subscale accounted for 4% variance in the general positive affects under hypnosis; those with more externally oriented affective processing style expressed less positive feelings about hypnotic state.

These values, although definitely lower than those observed by [Lichtenberg et al. \(2004\)](#) for personality, attentional, and psychogenetic variables, are equal to or higher than the effect of gender and intelligence, demonstrated by [Geiger et al. \(2014\)](#). These results suggest that alexithymia and emotional contagion contribute little but remarkable slices in the “hypnotic pie”; they also demonstrate that this pie has more layers, including emotional bond to the hypnotist and a phenomenological dimension of altered consciousness. Although it is also a matter of discussion, it should be mentioned here that the emotional valence of the hypnotic situation is most probably much more intense in individual hypnosis sessions, carried out in a psychotherapeutic context. Still, the above outlined observations underpin that even in laboratory hypnosis the affective processing style of the subjects may have a bearing on their hypnotic responses.

The main scales of RMET and ECS did not exert a stronger nonlinear influence on the hypnotic response than their linear effect. TAS-20 scores, however, showed a better fit if nonlinear (quadratic) regression was applied.

We will see it in the next chapter whether or not recalled parental rearing style has an influence on measures of mentalizing skills and hypnotic responses. Besides correlational and regression analyses, a new technique, cluster analysis will be introduced to see if parents can be categorized based on their behavior with their children. The mediating effect of mentalizing skills on the parental rearing style → hypnotic response link will also be investigated.

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9. PARENTAL BEHAVIOR, MENTALIZATION SKILLS AND HYPNOTIC RESPONSE

LET US NOW TURN OUR ATTENTION to how memories about the parents' behavior towards the child affect the grown-up adult's ability to mentalize and to respond to hypnosis. Similarly to the last chapter, first I will present data on correlation, and then multiple linear regression analyses will be performed to check if the variables of parental rearing have any predictive power on mentalizing and hypnotic responsiveness. I have to spoil the joke and tell in advance that although these correlations were in the same range as those between mentalization and hypnotic response, they were not significant and powerful enough to prove an association, in general. It has to be noted that EMBU, the measure of parental rearing style, has been just administered to a part of the sample which also have responses for the mentalization tests, therefore sample sizes were smaller than in the investigations we saw in the previous chapter. Given that the opposite-gender parent seems to exert a greater influence on the child's hypnotic response than the same-gender parent ([J. R. Hilgard, 1970](#)), correlation analyses were performed in a gender breakdown, for both parents. There were, nevertheless, some remarkable exceptions, demonstrating a robust association between the variables, with adequate statistical power. This meticulous pedantry may seem to be redundant, but a careful mapping of the robust correlations is a pre-requisite for mediation analyses which will be presented in the last section.

The small and insignificant correlations suggested that maybe it is not the single features of elements of parental behavior that make a difference in affective processing, but rather the *pattern* of parenting. As we saw it in Section 1.4 on parental behavior, developmental psychologists have made much effort to set up adequate theories of parental rearing style ([Baumrind, 1967](#); [Maccoby & Martin, 1983](#)). Large-sample quantitative research also supported the presence of the warm *versus* cold and the permissive *versus* controlling dimensions in the parent's behavior toward the child ([Pereira et al., 2009](#)). Following this line of thought, I performed cluster analysis on the EMBU subscales. The results supported that the theoretical classification can be used to categorize mothers and fathers into warm-controlling, warm-permissive, cold-controlling and cold-permissive groups. In the last section of this chapter, we will see if there are any differences between the mentalizing and the hypnotic capacities of the children in whose recall their parents belonged to different categories.

9.1. The Effects of Different Parental Rearing Style Variables

9.1.1. Correlations

Research **Question 1** of the present thesis was whether the memories on the parents' behavior are related to mentalizing skills. In **Hypothesis 1a**, I expected parental warmth to be associated with better, while cold-rejective parenting behavior with worse mentalizing abilities. Many correlations between parental rearing style and mentalization skills / hypnotic response were found to be in a similar range as we observed in the associations between mentalization and hypnotic susceptibility. However, the sample sizes for the former analyses were over 300 for the entire sample, in the latter, sample size was just around 250. Therefore the same ranges of correlations proved to be non-significant. The Holm-Bonferroni correction also suppressed many significant values, but the question emerges whether it is not due to the unreasonably strict correction. It has to be noted that some correlations suppressed by the Holm-Bonferroni procedure had high (over .80) statistical power. Therefore these results will also be reported below, separated for those correlations effected by the Type I error inflation reduction, but representing powerful associations.

Scores on EMBU subscales and RMET did not yield any significant correlations, or any with power > .80. Ability to read someone's mental state in the eyes and parental rearing (as assessed with EMBU seems to be entirely independent of each other.

The same can be said of the association between Emotional Contagion Scale and EMBU ($-.10 \leq r \leq .24$, *ns.*). Even the correlation between Father Emotional Warmth and ECS Positive, among boys ($r = .24$, $p = 0.01$ unadjusted) had insufficient power (.72). The other correlations, even being significant without the Holm-Bonferroni adjustment, showed lesser statistical power.

In EMBU subscales and TAS-20, significant and powerful association was found between the parent's overprotective and punishing behavior and the child's perceived difficulty in identifying her or his feelings. This can be seen in the four upper rows of **Table 59**.

Table 59 | Correlations between EMBU and TAS-20 subscales that were either significant or reaching a power higher than .80

	<i>r</i>	<i>p</i> ^a	power
Father Overprotection – Difficulty in Identifying Feelings in the entire sample (N= 193)	.24	.001	.92
Father Punishment – Difficulty in Identifying Feelings in the entire sample (N= 193)	.22	.002	.93
Mother Punishment – Difficulty in Identifying Feelings in the entire sample (N = 208)	.22	.001	.94
Mother Overprotection – Difficulty in Identifying Feelings in the entire sample (N= 208)	.22	.002	.93
Father Overprotection – Difficulty in Identifying Feelings in females ($n = 111$)	.28	ns. (.003)	.91
Mother Overprotection – Difficulty in Identifying Feelings in females ($n = 111$)	.27	ns. (.003)	.85
Mother Punishment – Difficulty in Identifying Feelings in females ($n = 111$)	.24	ns. (.009)	.84
Father Overprotection – TAS-20 Total Score in the entire sample (N= 193)	.21	ns. (.004)	.89
Father Rejection – Difficulty in Identifying Feelings in the entire sample (N= 193)	.19	ns. (.009)	.83

^aCorrelations are adjusted for Holm-Bonferroni criteria. Beside the values suppressed by the Holm-Bonferroni procedure, you can see the unadjusted significances in parentheses.

As you can see in **Table 59**, correlations in the bottom 5 rows “lost” their significance in the Holm-Bonferroni procedure, although they were significant before the adjustment.²⁸ They also represent adequate ($> .80$) statistical power, and—by the measure of *r*—also show low-medium effect. Hadn't we controlled the associations for familywise Type I error *taking all parental variables together* but treating them separately, the last four correlations would have been significant. It is again an example for the “tricky” nature of significances, and a reason for not to be overreliant on them. As we can see even these associations are also quite robust, and suggest that there is an effect of the parents' controlling behavior on the child's adult difficulty in accessing her or his feelings.

Hypothesis 2a was that both warm-supportive and cold-rejective parental behavior will be associated to higher hypnotic susceptibility. Correlations between EMBU subscales and HGSHS:A scores (following Holm-Bonferroni adjustment) did not prove to be either significant or powerful enough, with three exceptions. In females ($n = 124$), Father Emotional Warmth was negatively correlated with HGSHS:A Observer score ($r = -.26$, $p = .004$, power = .84), while Father Rejection and observer-score showed a positive association ($r = .24$, unadjusted $p = .008$, power = .85), and fathers' punitive behavior was also associated with observer-scores: ($r = .23$, unadjusted $p = .012$, power = .81).

In **Hypothesis 2b** I expected that recalling warm (emotionally responsive) parents will be associated with more positive, while memories on cold and rejective parents with more negative feelings towards the hypnotist. In the associations of EMBU and AIM, an interesting pattern was identified, so it seemed reasonable to depict the whole correlation matrix, which you can find in **Table**

²⁸There is no clear agreement in the literature on the optimal “coverage” of Holm-Bonferroni adjustment, i.e. how many consecutive comparisons should be corrected within one block. This problem will be discussed in Section 10.4 (A subjective note on statistics).

60. We can notice that in the entire sample, punishing-overcontrolling behavior and rejection of the parents was associated with a fear that the hypnotist would be dissatisfied with the subject. This pattern (rejective and restrictive at the same time) can be interpreted as the “cold-controlling” category in Baumrind’s model. Among males, the cold-controlling parental behavior was even more strongly associated with fear of displeasing the hypnotist than in the entire sample. To a smaller extent, the parents’ punishing behavior was related to negative feelings towards the hypnotist, which justifies that—for operational reasons—we can reiterate EMBU factors into such a subscale. Interestingly, fathers’ rejective and punitive behavior was also associated with positive feelings towards the hypnotist. These results show that 1) parents’ behavior influences the one-time child’s transference to the hypnotist; 2) transference can be ambivalent, loaded with positive and negative feelings (as a function of the parents’ negative behavior toward the child).

It was expected (**Hypothesis 2c**) that memories of parental behavior will influence experiences under hypnosis: Parental warmth and caring will be associated with more positive, while cold-rejective parental behavior with more negative feelings related to ASC. Phenomenological experiences were not remarkably associated with parental rearing style either, with two exceptions: PCI-5 Negative Affect was significantly related to Maternal Punishment ($r = .21, p = .001, \text{power} = .92$) and Paternal Punishment ($r = .20, p = .002, \text{power} = .87$) in the entire sample. In gender breakdown, no robust correlations were found.

These results suggest that mentalization skills, except for alexithymia and hypnotic response, except for archaic involvement are not related to parental rearing style. We should not forget, however, that our sample consisted mainly of “well-adapted” adults who participated in the hypnosis investigations voluntarily, and all of them declared they felt healthy in every sense at the time of the research. Possibly, if a clinical sample (for instance, patients with PTSD, borderline personality disorder, or those abused or neglected in childhood) had been examined, stronger associations would have been detected.

Table 60 | Correlations between EMBU and AIM subscales that were either significant or reaching a power higher than .80, in the entire sample (**printed in black**) or in men (**printed in blue**). In the female subsample, no significant associations were observed.

	Maternal EMBU Subscales (<i>N</i> = 246, <i>n</i> = 111)				Paternal EMBU Subscales (<i>N</i> = 230, <i>n</i> = 106)			
	Mother rejection	Mother emotional warmth	Mother over-protection	Mother punishment	Father rejection	Father emotional warmth	Father over-protection	Father punishment
AIM+					.20 (<i>ns.</i> , power = .91) .28 (<i>ns.</i> , power = .82)			.29 (<i>ns.</i> , power = .85)
AIM-	.39 (<i>p</i> < .001, power = .99)			.20 (<i>ns.</i> , power = .93) .42 (<i>p</i> < .001, power > .99)				.29 (<i>ns.</i> , power = .85)
Admiration and bonding to the hypnotist								
Fear of negative appraisal	.36 (<i>p</i> < .001, power = .97)		.21 (<i>p</i> = .001, power = .94) .31 (<i>p</i> = .001, power = .90)	.24 (<i>p</i> < .001, power = .98)	.19 (<i>ns.</i> , power = .89) .34 (<i>p</i> < .001, power = .95)		.22 (<i>p</i> = .001, power = .95) .30 (<i>ns.</i> , power = .89)	.24 (<i>p</i> < .001, power = .98) .42 (<i>p</i> < .001, power > .99)
Need for dependence					.20 (<i>ns.</i> , power = .90)		.22 (<i>p</i> = .001, power = .95)	

Note. Significance levels were adjusted for Holm-Bonferroni procedure. For a better overview, the matrix does not contain correlations that are not significant or do not reach a statistical power of .80. **The table show that there were small to medium-sized correlations between parental behavior and archaic involvement in the entire sample and in the male sample, but not in females. The rejective, overprotective and punitive behavior of both parents has a medium-sized correlations with the male Ss' fear that the hypnotist will evaluate them negatively.**

9.1.2. Multiple Linear Regression Analyses

As we saw in the case of “mentalization skills → hypnotic response” regression analyses, variables of mentalization and the Ss’ age, gender, and profession (being or not being a psychologist) built a meaningful set of predictors, which explained a not too high, but remarkable part in the variability of hypnotic susceptibility. In this section, we will check whether such analyses can also be conducted to unfold the hypothesized “parental rearing style → mentalization” and “parental rearing style → hypnotic response” causal links. These analyses give a more detailed answer to **Research Question 2** (whether memories parental behavior is related to hypnotic responses) than correlational analyses.

From the generally low correlations, you may infer that regression will not show much stronger associations, even if the age, gender, and belonging to the psychologist profession are controlled. Indeed, parental rearing style and the background variables did not predict any variability in RMET scores, ECS Total, TAS-20 Difficulty in Describing Feelings, PCI-5 Dissociative Control, Positive Affect, or Visual Imagery. Paternal Rejection explained 2.4% of the variance of HGSHS:A Observer-scores and 1.5% that of Self-scores; Maternal Emotional Warmth accounted for 3.5% variance in ECS Positive (while Paternal Emotional Warmth contributed to it in 2.2%). Still, these small slices all had significant contributions to the variations in the outcome variables.

In the variability of ECS Negative, TAS-20 Total, TAS-20 Difficulty in Identifying Feelings, TAS-20 Pragmatic Thinking, AIM+, AIM–, AIM Fear of Negative Appraisal, PCI-5 Negative Affect and Attention to Internal Processes, the combination of the subject variables and parental rearing style subscales explained more than 5% of variability, therefore, these analyses will be presented in detail below.

The combination of gender, Paternal Punishment and age explained 23.5% variability of ECS Negative (**Table 61**). However, as the initial model shows, gender had a much stronger explanative power than the other two variables, which suggests that the father’s punitive behavior has just a small—albeit significant—impact on adult emotional contagion. Fathers’ overprotective behavior, age, and being or not being a psychologist shared 8.6% variance in the TAS-20 total scores. As opposed to ECS Negative, here in the initial model, paternal overprotection accounted for 4% of the variation (**Table 62**). Beta values in the final model suggest that the three variables contribute to alexithymia at around the same level. A similar pattern was found for TAS-20 Difficulty in Identifying Feelings subscale: As **Table 63** shows, its variability is explained by paternal overprotection, age, and maternal punishment to 11%. Beta values indicate that parents’ behavior and age has similar strength.

From the variability of positive transference towards the hypnotist (assessed with AIM+ scores), 6% can be explained by paternal punishment and age. To a less extent, the more punished and the younger Ss felt more positive toward their hypnotists (**Table 64**). More paternal punishment was associated with more positive feelings, while more maternal punishment was linked with less negative feelings towards the hypnotist: Age and mothers’ punitive behavior explained 9% of variance of AIM– scores (**Table 65**). Beta coefficients suggest that both variables contributed to the effect with the same strength. The two parents’ punishing behavior and age together accounted for 13.5% variance in AIM Fear of Negative Appraisal: Younger and more frequently punished Ss expressed more fear that the hypnotist will be displeased with them (**Table 66**). Maternal punishment, profession and age explained the variance of PCI-5 Negative Affect scores to 9.5% (**Table 67**); age and maternal overprotection accounted for 5.6% variance in PCI-5 Attention to Internal Processes scores (**Table 68**).

Table 61 | Multiple regression analysis: The influence of parental rearing style on ECS Negative ($N = 229$)

Predictor Variables	Coefficients			Contributions			Comparison of Models				Durbin-Watson
	<i>B</i>	<i>SE(B)</i>	<i>Beta</i>	<i>t</i>	sig.	<i>adj. R</i> ²	ΔR^2	ΔF	ΔF sig.	power	
Model 1: $F(1, 223) = 53.69, p < .001, f^2 = .234$											
Constant	0.83	0.10		7.95	< .001						
Gender	0.47	0.07	.44	7.33	< .001	.190	.190	53.69	< .001	> .99	
Model 2: $F(2, 222) = 31.46, p < .001, f^2 = .272$											
Constant	0.54	0.15		3.63	< .001						
Gender	0.48	0.06	.45	7.56	< .001						
Father Punishment	0.02	0.01	.16	2.76	.006	.214	.024	7.63	.006	> .99	
Model 3: $F(3, 221) = 23.89, p < .001, f^2 = .307$											
Constant	0.27	0.18		1.54	.125						
Gender	0.48	0.06	.45	7.68	< .001						
Father Punishment	0.02	0.01	.17	2.93	.004						
Age	0.01	0.003	.15	2.65	.009	.235	.021	7.04	.009	> .99	2.01

The table shows that gender, Paternal Punishment and age explain 23.5% variance of ECS Negative scores.

Table 62 | Multiple regression analysis: The influence of parental rearing style on TAS-20 Total Scores ($N= 193$)

Predictor Variables	Coefficients			Contributions			Comparison of Models				Durbin-Watson
	<i>B</i>	<i>SE(B)</i>	<i>Beta</i>	<i>t</i>	sig.	<i>adj. R</i> ²	ΔR^2	ΔF	ΔF sig.	power	
Model 1: $F(1, 188) = 8.98, p = .003, f^2 = .042$											
Constant	38.54	2.49		15.50	< .001						
Father Overprotection	0.42	0.14	.21	2.99	.003	.040	.040	8.98	.003	.86	
Model 2: $F(2, 187) = 8.00, p = .001, f^2 = .064$											
Constant	43.50	3.31		13.14	< .001						
Father Overprotection	0.39	0.14	.20	2.77	.006						
Age	-0.15	0.07	-.16	-2.24	.026	.061	.021	5.03	.026	.94	
Model 3: $F(3, 186) = 6.91, p < .001, f^2 = .094$											
Constant	38.52	3.84		10.04	< .001						
Father Overprotection	0.42	0.14	.21	2.98	.003						
Age	-0.17	0.07	-.18	-2.55	.012						
Psy or Non-Psy	5.66	2.29	.17	2.48	.014	.086	.025	6.13	.014	.96	2.32

The table shows that Paternal Overprotection, age and profession (being or not being a psychologist) explain 8.6% variance of TAS-20 Total scores.

Table 63 | Multiple regression analysis: The influence of parental rearing style on TAS-20 Difficulty in Identifying Feelings ($N=193$)

Predictor Variables	Coefficients			Contributions			Comparison of Models				Durbin-Watson
	<i>B</i>	<i>SE(B)</i>	<i>Beta</i>	<i>t</i>	sig.	<i>adj. R</i> ²	ΔR^2	ΔF	ΔF sig.	power	
Model 1: $F(1, 188) = 11.29, p = .001, f^2 = .055$											
Constant	14.68	1.35		10.85	< .001						
Father Overprotection	0.26	0.08	.24	3.36	.001	.052	.052	11.29	.001	.89	
Model 2: $F(2, 187) = 10.55, p < .001, f^2 = .101$											
Constant	18.32	1.78		10.28	< .001						
Father Overprotection	0.23	0.08	.22	3.08	.002						
Age	-0.11	0.04	-.21	-3.05	.003	.092	.040	9.30	.003	.98	
Model 3: $F(3, 186) = 8.68, p < .001, f^2 = .122$											
Constant	16.76	1.91		8.77	< .001						
Father Overprotection	0.18	0.08	.17	2.35	.020						
Age	-0.11	0.04	-.21	-3.06	.003						
Mother Punishment	0.19	0.09	.15	2.13	.034	.109	.017	4.54	.034	.99	2.28

The table shows that Paternal Overprotection, age and Maternal Punishment explain 10.9% variance in TAS-20 Difficulty in Identifying Feelings scores.

Table 64 | Multiple regression analysis: The influence of parental rearing style on AIM Positive ($N=230$)

Predictor Variables	Coefficients			Contributions			Comparison of Models				Durbin-Watson
	<i>B</i>	<i>SE(B)</i>	<i>Beta</i>	<i>t</i>	sig.	<i>adj. R</i> ²	ΔR^2	ΔF	ΔF sig.	power	
Model 1: $F(1, 224) = 10.41, p = .001, f^2 = .040$											
Constant	43.28	4.57		9.47	< .001						
Father Punishment	1.20	0.37	.21	3.23	.001	.040	.040	10.41	.001	.86	
Model 2: $F(2, 223) = 7.71, p = .001, f^2 = .059$											
Constant	53.12	6.37		8.34	< .001						
Father Punishment	1.15	0.37	.20	3.12	.002						
Age	-0.33	0.15	-.14	-2.20	.029	.056	.056	4.83	.029	.91	2.14

The table shows that Paternal Punishment and age explain 5.6% variance in AIM Positive scores.

Table 65 | Multiple regression analysis: The influence of parental rearing style on AIM Negative ($N=230$)

Predictor Variables	Coefficients			Contributions			Comparison of Models				Durbin-Watson
	<i>B</i>	<i>SE(B)</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>adj. R²</i>	ΔR^2	ΔF	ΔF sig.	power	
Model 1: $F(1, 224) = 11.83, p = .001, f^2 = .048$											
Constant	8.40	0.71		11.82	< .001						
Age	-0.08	0.02	-.22	-3.44	.001	.046	.046	11.83	.001	.91	
Model 2: $F(2, 223) = 11.65, p < .001, f^2 = .094$											
Constant	6.12	0.98		6.24	< .001						
Age	-0.08	0.02	-.22	-3.44	.001						
Mother Punishment	0.18	0.05	-.22	3.31	.001	.086	.040	10.95	.001	.98	1.98

The table shows that age and Maternal Punishment explain 8.6% variance in AIM Negative scores.

Table 66 | Multiple regression analysis: The influence of parental rearing style on AIM Fear of Negative Appraisal ($N=230$)

Predictor Variables	Coefficients			Contributions			Comparison of Models				Durbin-Watson
	<i>B</i>	<i>SE(B)</i>	<i>Beta</i>	<i>t</i>	<i>sig.</i>	<i>adj. R²</i>	ΔR^2	ΔF	ΔF sig.	power	
Model 1: $F(1, 224) = 16.11, p < .001, f^2 = .067$											
Constant	3.60	0.27		13.12	< .001						
Age	-0.04	0.01	-.26	-4.01	< .001	.063	.063	16.11	< .001	.97	
Model 2: $F(2, 223) = 16.81, p < .001, f^2 = .140$											
Constant	2.53	0.37		6.78	< .001						
Age	-0.04	0.01	-.25	-4.05	< .001						
Mother Punishment	0.08	0.02	.25	4.05	< .001	.123	.060	16.41	< .001	> .99	
Model 3: $F(3, 233) = 12.75, p < .001, f^2 = .156$											
Constant	2.01	0.45		4.47	< .001						
Age	-0.04	0.01	-.24	-3.86	< .001						
Mother Punishment	0.07	0.02	.21	3.21	.002						
Father Punishment	0.04	0.02	.13	2.04	0.043	.135	.012	4.15	.043	> .99	2.13

The table shows that age, and Paternal and Maternal Punishment explain 13.5% variance in AIM Fear of Negative Appraisal scores.

Table 67 | Multiple regression analysis: The influence of parental rearing style on PCI-5 Negative Affect ($N=230$)

Predictor Variables	Coefficients			Contributions			Comparison of Models				Durbin-Watson
	<i>B</i>	<i>SE(B)</i>	<i>Beta</i>	<i>t</i>	sig.	<i>adj. R²</i>	ΔR^2	ΔF	ΔF sig.	power	
Model 1: $F(1, 224) = 10.90, p = .001, f^2 = .044$											
Constant	-1.07	0.34		-3.15	.002						
Mother Punishment	0.09	0.03	.21	3.30	.001	.042	.042	10.90	.001	.88	
Model 2: $F(2, 223) = 11.06, p < .001, f^2 = .089$											
Constant	-0.01	0.46		-0.02	.998						
Mother Punishment	0.09	0.02	.22	3.41	.001						
Psy or Non-Psy	-1.18	0.36	-.21	-3.28	.001	.082	.040	10.75	.001	.96	
Model 3: $F(3, 233) = 8.85, p < .001, f^2 = .104$											
Constant	0.56	0.54		1.04	.298						
Mother Punishment	0.09	0.02	.21	3.38	.001						
Psy or Non-Psy	-1.09	0.36	-.19	-3.03	.003						
Age	0.02	0.01	-.13	-2.03	.043	.095	.013	4.13	.043	.99	2.15

The table shows that Maternal Punishment, profession (being or not being a psychologist) and age explain 9.5% variance of PCI-5 Negative Affect scores.

Table 68 | Multiple regression analysis: The influence of parental rearing style on PCI-5 Attention to Internal Processes ($N=230$)

Predictor Variables	Coefficients			Contributions			Comparison of Models				Durbin-Watson
	<i>B</i>	<i>SE(B)</i>	<i>Beta</i>	<i>t</i>	sig.	<i>adj. R²</i>	ΔR^2	ΔF	ΔF sig.	power	
Model 1: $F(1, 224) = 10.49, p = .001, f^2 = .041$											
Constant	0.71	0.28		2.59	.01						
Age	-0.03	0.01	-.21	-3.24	.001	.040	.040	10.49	.001	.86	
Model 2: $F(2, 223) = 7.67, p < .001, f^2 = .059$											
Constant	0.01	0.43		0.06	.995						
Age	-0.03	0.01	-.20	-3.09	.002						
Mother Overprotection	0.03	0.01	.14	2.16	.031	.056	.016	4.69	.031	.91	2.04

The table shows that age and Maternal Overprotection explain 5.6% variance of PCI-5 Attention to Internal Processes scores.

The parental variables also explained some variance in the phenomenological experiences of altered consciousness under hypnosis. Maternal Punishment, being or not being a psychologist, and age accounted for 9.5% variance in PCI-5 Negative Feelings. As beta coefficients show, both the mother's punitive behavior and profession contributed with a similar (absolute value around .20) strength; age counted somewhat less. To a small-medium extent, Ss who recalled more punishment from their mother, were not psychologists, and were younger, perceived the hypnotic state more negatively. Finally, PCI-5 Attention to Internal Processes was explained to 5.6% by age and Maternal Overprotection.

Since in stepwise regression, variables showing excessive correlation were excluded from the model (to prevent multicollinearity), maternal and paternal variables necessarily "compete" with each other: the SPSS does not let all variables enter which would have predicted the outcome variable, if they are associated, just the one which is a stronger predictor. As we saw in Section 6.1 on the psychometric properties of EMBU, recalled maternal and paternal behavior are strongly correlated (around $r = .60$ to $.70$). Therefore, we can assume that some variables which would have acted as predictors of mentalization skills or that of hypnotic response were deleted from the regression models. To check this, I conducted all regression analyses, entering variables of the mothers' and the fathers' rearing styles separately.

While maternal emotional warmth accounted for 3.5% of the variance in ECS Positive, paternal warmth explained another 2.2% of its variation. As we saw for the overall explanation of TAS-20 Difficulty in Identifying Feelings in **Table 63**, Paternal Overprotection, Maternal Punishment, and age accounted for 13.5% of its variability. Separate analysis of the parental behavior's effect revealed that age, Maternal Punishment, Maternal Rejection, and gender were responsible for an even larger part of its variability, 14.1% ($f^2 = .15$ indicating medium-size effect). This result suggests that both parents' controlling behavior has a small-to-medium unfavorable effect on the child's adult alexithymic emotion processing, but the mothers' cold-controlling style may have an even stronger effect. A similar pattern was found for ECS Negative. When the effects of the two parents were analyzed separately, it turned out that gender, Maternal Punishment, and age explains a similar part in the variability of negative emotional contagion (23.8%) as gender, Paternal Punishment, and age did. (In both models, punitive parental behavior had a relatively small, but significant predictive power.)

In AIM+, Maternal Punishment and age explained the same level of variation (5.6%) as Paternal Punishment and age did, if all parental variables were involved in the analyses. This means that the more frequent punishment (from either of the two parents) the child recalls, the slightly more positively s/he will feel towards the hypnotist.

In sum, these results suggest that those adults who recall more punishment from their childhood will show a higher propensity to automatically take and mimic others' negative emotions. High level of recalled overprotective behavior of the father was associated with an increase in overall alexithymia scores. The parents' cold-controlling (frequently punishing and overprotective) style seems to lead to higher perceived difficulty in identifying feelings. Recalled cold-controlling pattern of parental behavior was also reflected in hypnotic response. A small but significant association was detected between fathers' rejective behavior and HGSHS:A scores. Increased frequency in the punishment from both parents predicted more positive and less negative transference feelings towards the hypnotist. Punishment also acted as a predictor for AIM Fear of Negative Appraisal scores. Those Ss who recalled getting more punishment from either parent expressed more concern that the hypnotist would be dissatisfied with their hypnotic performance. Maternal punishment predicted more negative feelings under hypnosis. Maternal overprotection was associated with the S's attention to the internal processes under hypnosis. The associations usually had small to medium effect sizes, and age also contributed to many of these effects. In general, it seems that the mentalization skills and hypnotic response of the older Ss are less influenced by the recalled parental behavior.

9.2. Patterns of Parental Behavior: A Cluster Analytic Approach

The above mentioned results suggest that it may not be the *single* elements or variables of parental behavior that influence mentalizing and hypnotic response, but rather a *pattern* of specific rearing styles. To check whether subjects can be classified based on how they recall their parent’s style, cluster analyses were performed separately for the mother’s and father’s variables. Such an analysis was carried out by [Pereira et al. \(2009\)](#), who investigated whether clusters of parental behavior make a difference in school children’s externalizing and internalizing problem behavior. They used a longer, 32-item version of EMBU. They used hierarchical cluster analysis and validated a four-cluster solution with the two-step method (first an agglomerative hierarchical procedure was applied, than the four initial cluster centroids were subjected to a K-means iterative analysis). They identified that both mothers and fathers can be classified into “Low Support”, “Supportive-controller”, “Rejecting-controller” and “Supportive” types. Based on the differences, these groups largely correspond with “Cold-Permissive” (Neglectful), “Warm-Controlling” (Authoritative), “Cold-Controlling” (Authoritarian), and “Warm-Permissive” types in the theories of [Baumrind \(1967\)](#) and [Maccoby and Martin \(1983\)](#). As you can see in **Figures 26a–c** (for fathers) and in **Figures 26d–f** (for mothers), my analysis carried out with K-means method, a pre-set number of four clusters for both parents, led to a very similar cluster solution as those observed by Pereira and her colleagues. In these figures, you can see the mean scores of parental behavior across the clusters (error bars indicate 95% confidence interval). Across the hypothetic four clusters of paternal behavior, there were significant effects of Rejection [$F(3, 226) = 1114.11, p < .001, \omega = .75, \text{power} > .99$], Emotional Warmth [$F(3, 226) = 228.33, p < .001, \omega = .86, \text{power} > .99$], and Overprotection [$F(3, 226) = 78.37, p < .001, \omega = .72, \text{power} > .99$]. Across the clusters of maternal styles, the same three dimensions discriminated: Rejection [$F(3, 242) = 37.65, p < .001, \omega = .84, \text{power} > .99$], Emotional Warmth [$F(3, 242) = 121.03, p > .001, \omega = .77, \text{power} > .99$], and Overprotection [$F(3, 242) = 193.20, p < .001, \omega = .84, \text{power} > .99$].

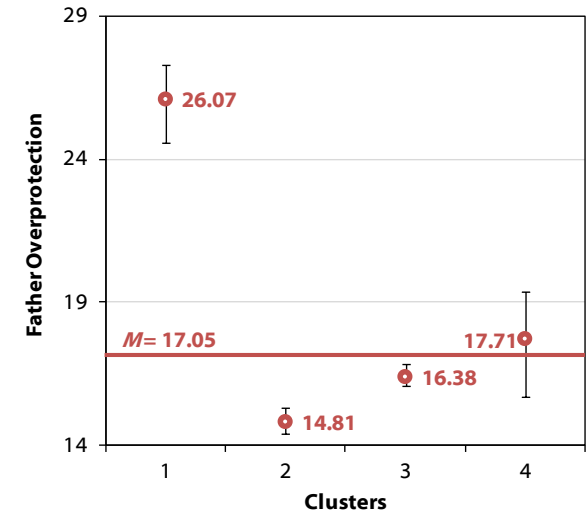
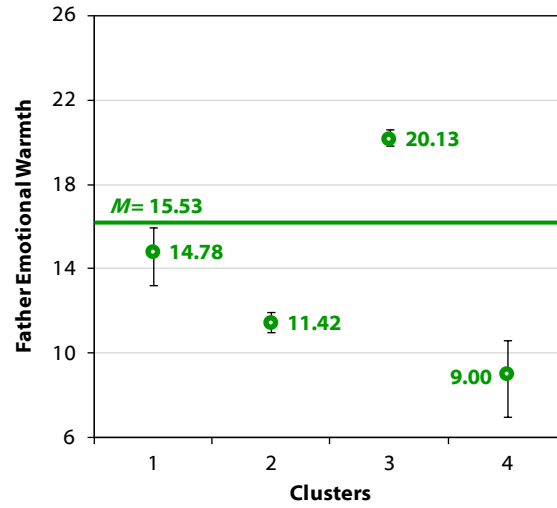
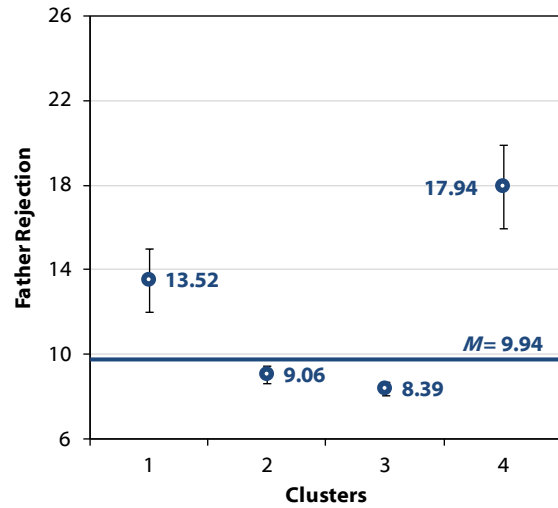
Table 69 | Proportion of parents belonging to different clusters

Fathers	n	%	Mothers	n	%
Warm-Supportive	103	44.8	Warm-Supportive	118	48.0
Cold-Permissive	83	36.1	Cold-Permissive	58	23.6
Average-Controlling	27	11.7	Average-Controlling	37	15.0
Cold-Distant	17	7.4	Cold-Controlling	33	13.4
Total	230	100	Total	246	100

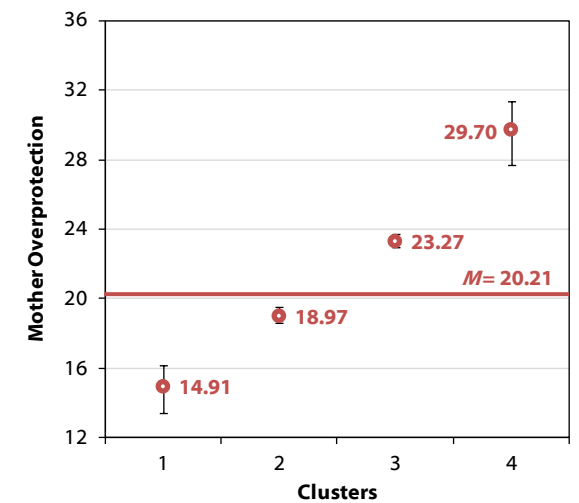
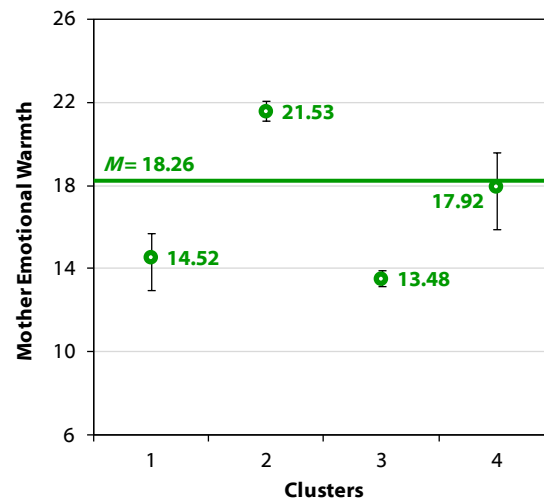
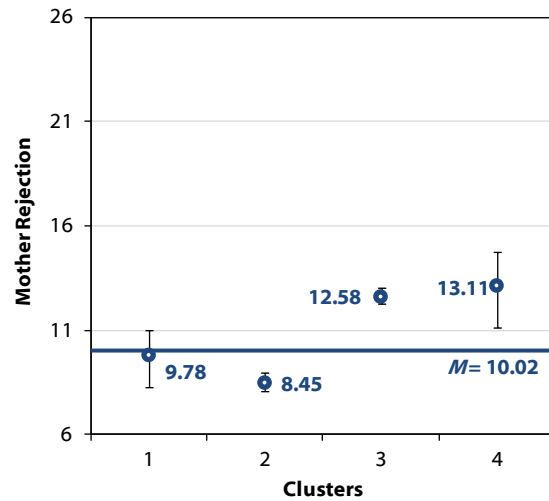
If you compare means of single behaviors across clusters, you can notice that in both parents, there are some who, according to the child’s evaluation, showed low levels of rejection, high emotional warmth, and around average overprotection. They seem to correspond with the theoretical “**Warm-Supportive**” category. Another group of parents are remembered as showing average levels of rejection, low overprotection and low emotional warmth. They belong to the “**Cold-Permissive**” category. A third group of parents show rejection somewhat over the average, but average level of emotional warmth, and high levels of overprotection. This made obvious that they cannot be labeled as “Warm-Controlling”, since we don’t know if this “average” level of emotional warmth represents well the population of the Ss’ peers. That was my reason for coining this group of parents “**Average-Controlling**”. Both parents in the fourth group showed higher than average rejection (the fathers much higher) and low emotional warmth, but they differed in overprotection. Mothers in this cluster also exhibited somewhat higher than average overprotection, while fathers scored well below than their average. It seems that such mothers can be labeled as “**Cold-Controlling**”, while fathers in this group rather seem to be rejective and inattentive to their children; therefore I labeled them “**Cold-Distant**”. You can see how many parents fell into each cluster in **Table 69**.

Almost half of the parents belonged to the Warm-Supportive category, and another larger part of them (around one third of the fathers and a quarter of the mothers) to the Cold-Permissive cluster. These categories and proportions cannot be directly compared to those in the study of Pereira et al., because they used a somewhat different classification, and their Ss were 8–11-year-old children. Nevertheless, 36.4% of the kids in their study reported to have supportive (and 29.4% of them supportive-controlling) parents, which supports the impression that the majority of the subjects in the general population recall responsive and caring parents. As we saw in Section 1.5, this kind of parental behavior is believed to be associated with adequate mentalization skills.

Making comparisons across Ss who recall parents belonging to different clusters can justify **Hypothesis 1b** and **Hypotheses 2a, b, c**, predicting that cluster membership of the parents may make differences in the mentalizing ability and hypnotic responses of the Ss.

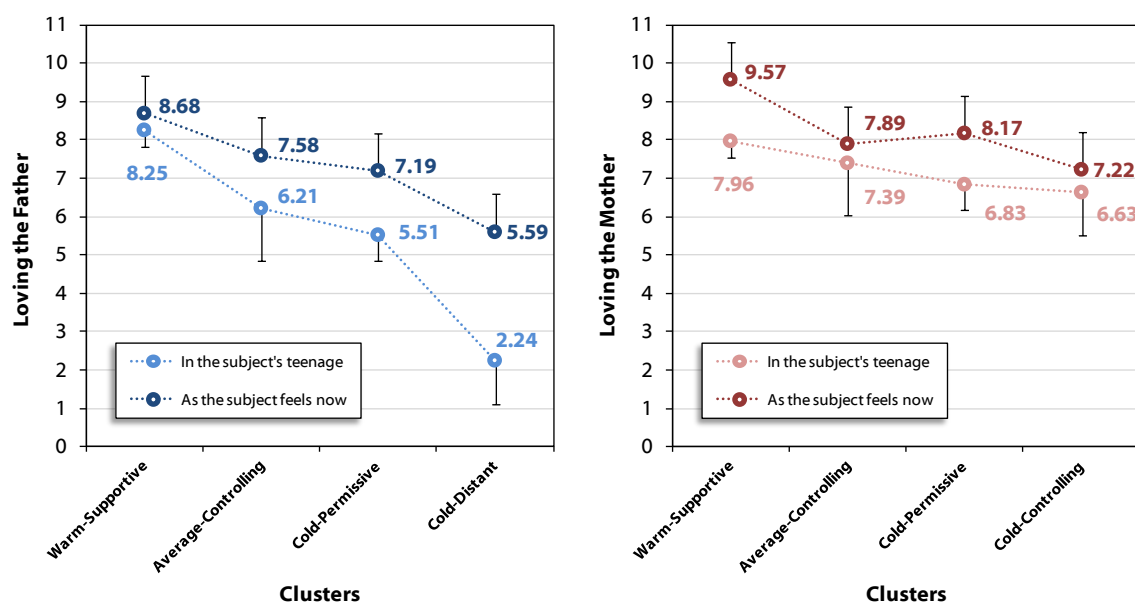


Figures 26a, b, c | Differences in Paternal Rejection, Emotional Warmth and Overprotection across the clusters ($N=230$). The pattern of the difference suggests that fathers can be classified into “Average-Controlling” (Cluster 1), “Cold-Permissive” (Cluster 2), “Warm-Supportive” (Cluster 3), and “Cold-Distant” (Cluster 4).



Figures 26d, e, f | Differences in Maternal Rejection, Emotional Warmth and Overprotection across the clusters ($N=246$). The pattern of the difference suggests that mothers can be classified into “Cold-Permissive” (Cluster 1), “Warm-Supportive” (Cluster 2), “Cold-Controlling” (Cluster 3), and “Average-Controlling” (Cluster 4).

Since the cluster analysis was based on Rejection, Emotional Warmth, and Overprotection, it seems quite obvious that these dimensions will show great differences across clusters. To validate the detected cluster solutions, the four items assessing love towards the parents (as the S felt as a teenager, and as s/he feels about the parent at the time of assessment) were used. If the detected cluster structure is valid, we can expect that the Ss will also express different levels of love towards the parents who belong to different clusters. It may be logical to expect children of warm-supportive parents to report the highest level of love, while those of cold-distant fathers and cold-controlling mothers to show the least love to their parents, both when the Ss were teenagers and at the time of assessment. Since the judgments of the Ss seem to become more favorable with respect to love from adolescence to adulthood (cf. **Figures 8a–b**), we can also expect that they will express more love to even cold-controlling or cold-controlling parents now as they felt when they were teenagers. You can see how parents across clusters are loved by their children as teenagers and as adults in **Figures 27a** and **27b**. (Given that the clusters are separate entities, the mean scores are connected with the dotted line just to make it easier to compare the tendencies of adult and adolescent judgments).



Figures 27a, b | Love for fathers ($N = 222$) and for mothers ($N = 223$) belonging to different clusters in the Ss' teenage (light dots) and as s/he felt in the time of testing (dark dots). *Note.* Error bars indicate 95% confidence interval. **The figures show that parents belonging to Warm-Supportive clusters are the most loved ones, while Cold-Distant fathers and Cold-Controlling fathers evoked the least love. In judgments of fathers, evaluations are more polarized than those of mothers. Adult judgments in general are more favorable than how the Ss thought they loved the given parent when they were adolescents.**

In line with the above outlined expectations, robust differences can be found in the love towards parents belonging to different clusters. This effect was detected in the Ss' feelings towards their fathers in their adolescence [Kruskal-Wallis $\chi^2(3) = 69.30, p < .001, \omega = .57^{29}$, power < .99] and when they completed EMBU [K-W $\chi^2(3) = 33.74, p < .001, \omega = .42$, power < .99]; the same effect emerged for mothers, regarding the Ss' teenage years, although its size was smaller [K-W $\chi^2(3) = 11.74, p = .008, \omega = .18$, power < .99]. At the time of testing, different levels of love was reported for mothers across different clusters, too, with medium effect size [K-W $\chi^2(3) = 52.27, p < .001, \omega = .48$, power > .99]. These differences suggest that the observed cluster structure is valid. Another way to prove the validity is the visual analysis of the 3-dimensional scatter plots showing each case with its cluster membership. These scatter plots can be seen in **Figure 28** (for fathers) and **Figure 29** (for mothers).

²⁹Omega effect size values are derived from the respective parametric ANOVAs, adjusted for .955 asymptotic relative efficiency (see Section 5.6.4 on effect sizes).

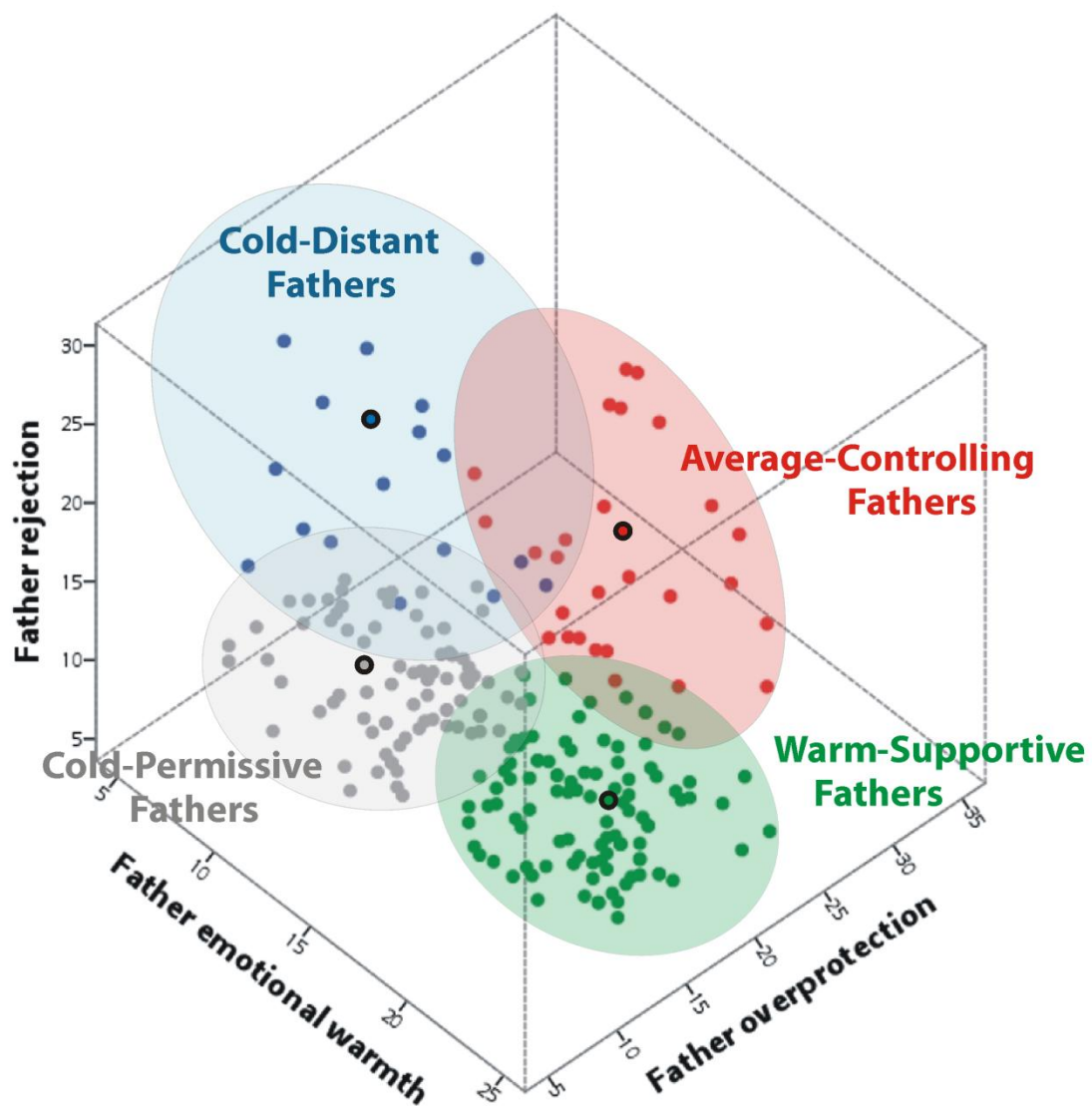


Figure 28 | K-means cluster analysis, based on the three dimensions of paternal behavior.

Note. The bubbles with different color are the observed clusters, consisting of those cases (in uniform color) that belong to the given cluster. Dots with black edge are the cluster centroids.

As you can see in Figures 28 and 29, the clusters are relatively well-separated. Each cluster is indicated by a large bubble; cases with the same color indicate those subjects who—based on their EMBU scores—belong to the given cluster. The middle points of the bubbles, marked with black edge, are the cluster centroids.

Differences in dimensions of parental rearing, the discrimination analysis of love towards the parents across clusters and the visual analysis of the scatter plots all suggest that the observed cluster structure makes a meaningful and valid classification of parental rearing styles.

A last method of testing the cluster structure was to repeat the analysis with the two-step clustering method in SPSS. As mentioned above, this technique first creates “pseudo-clusters”, based on an agglomerative hierarchical procedure; then these preliminary clusters are iterated further with the K-means method until an adequate structure is obtained. The advantage of the two-step method is that we don’t have to pre-set the number of the factors, but the analysis itself will result in an optimal cluster number (Norušis, 2012). Its drawback is that it is not as reliable as other methods (Bacher, Wenzig, & Vogler, 2004). Nevertheless, it resulted in a very similar cluster solution as the one emerging in the present K-means analysis. This result gives further support to the validity of this classification.

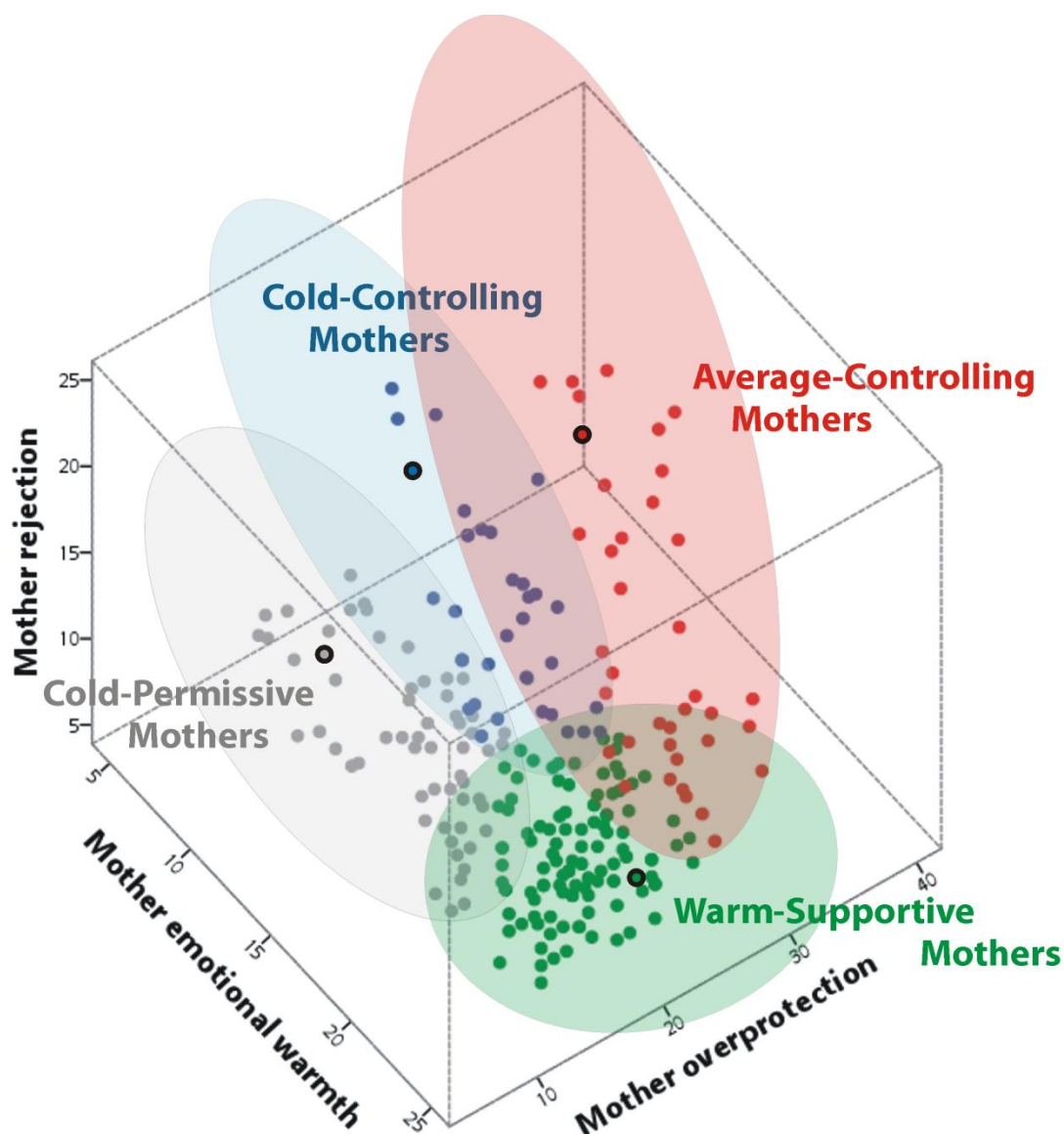


Figure 29 | K-means cluster analysis, based on the three dimensions of maternal behavior.
Note. The bubbles with different color are the observed clusters, consisting of those cases (in uniform color) that belong to the given cluster. Dots with black edge are the cluster centroids.

9.3. Mentalizing Skills and Hypnotic Response Across Parental Rearing Style Clusters

As we saw in the previous chapters, the relationship between parental rearing style and mentalization/hypnotizability show gender differences. Therefore in analyzing how parental clusters affect these variables, the effect of gender should also be taken in consideration. Therefore in the following, two-way ANOVAs were performed, with clusters of parental style and gender as grouping variables, while mentalization skills and hypnotic response as outcome variables. The interaction of parental cluster \times gender was also included in the analyses of variance. The analyses were performed separately for both parents.

Let us see first if the fathers' clusters and gender had any effect. For significant results, power and effect sizes of the given part of the effect (as indicated by partial eta squared, η_p^2) will also be displayed. These variables made no difference (either on their own or their interaction) on positive emotional contagion [$F(7, 221) = 1.20, p = .31$]. In negative emotional contagion, a significant overall effect was found: $F(7, 221) = 8.57, p < .001, \eta_p^2 = .21, \text{power} > .99$). Although the effect cannot be attributed to the difference across clusters [$F(3, 221) = 1.62, p = .19$] or to cluster \times gen-

der interaction [$F(3, 221) = 1.08, p = .36$], gender itself had a significant effect, indicating that women recalling all types of fathers showed higher propensity for negative emotional contagion than men [$F(1, 221) = 35.38, p < .001, \eta^2_p = .14, \text{power} > .99$]. The same pattern was observed for ECS total scores: for the overall effect, $F(7, 211) = 6.79, p < .001, \eta^2_p = .18, \text{power} > .99$. Neither the effect of cluster membership ($p = .107$), nor the cluster \times gender interaction ($p = .28$) counted, but females in general were more prone to emotional contagion than male Ss: $F(1, 221) = 26.60, p < .001, \eta^2_p = .11, \text{power} > .99$.

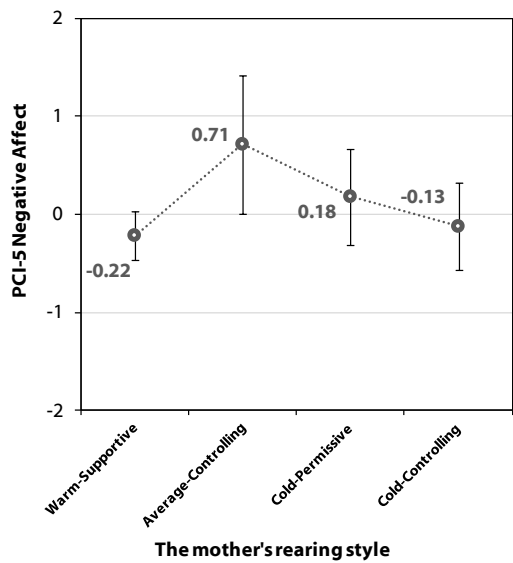
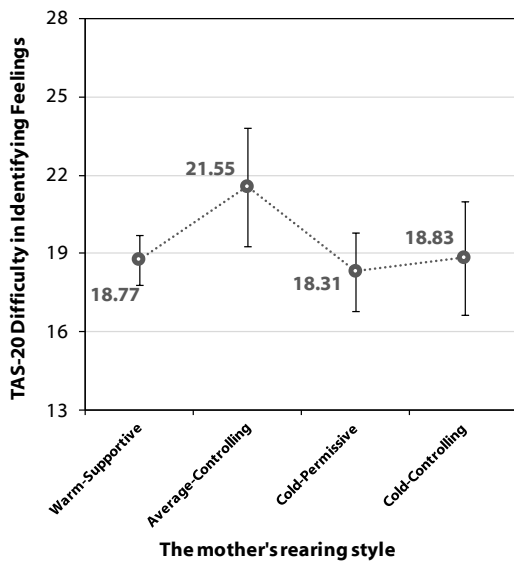
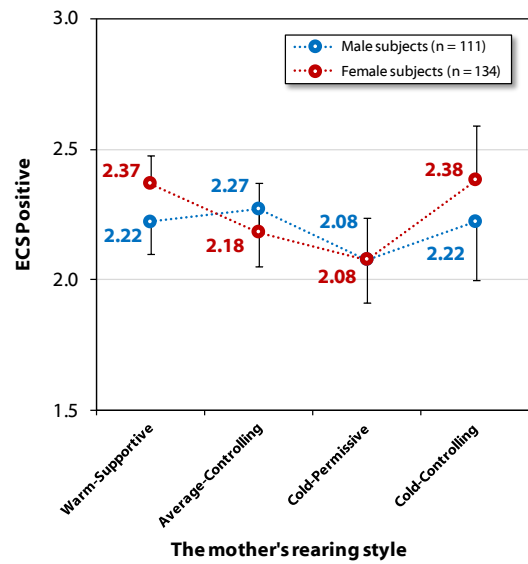
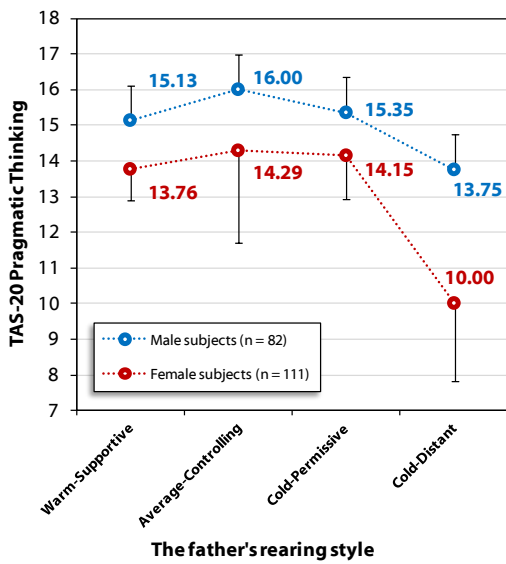
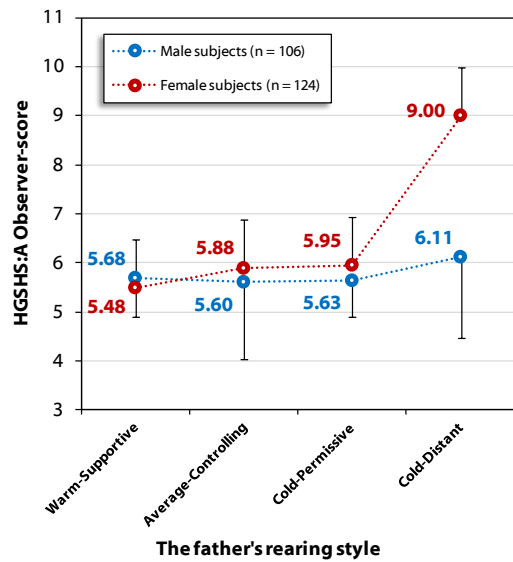
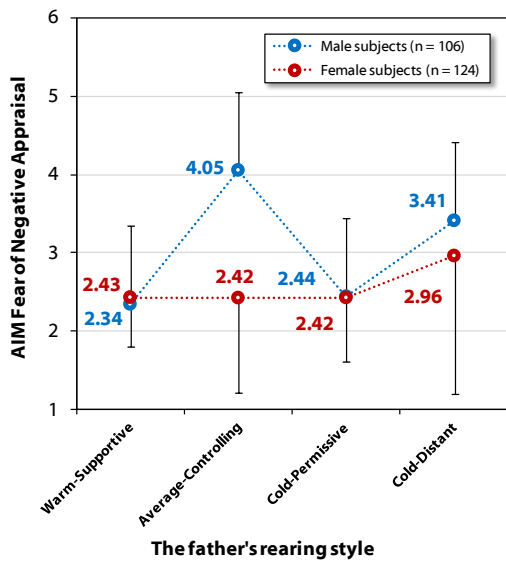
In RMET scores, a significant overall effect was observed: $F(7, 220) = 2.67, p = .011$, although with a rather small effect: $\eta^2_p = .08, \text{power} = .89$. Neither the cluster membership ($p = .56$) nor gender ($p = .14$) was responsible for this effect, but there was an interaction: $F(3, 220) = 4.25, p = .006, \eta^2_p = .06, \text{power} = .86$. In all paternal clusters, females performed slightly better for RMET, except the children of cold-permissive fathers, whose sons scored around 2 points higher than the daughters.

Fathers' rearing style and gender did not make a difference in TAS-20 Difficulty in Identifying Feeling scores [$F(7, 185) = 1.40, p = .208$]. TAS Difficulty in Describing Feelings also seemed not to be influenced by gender or father's rearing style [$F(7, 185) = 1.09, p = .37$]. In TAS Pragmatic Thinking, an overall effect was observed: $F(7, 185) = 1620.11, p > .001, \eta^2_p = .09, \text{power} = .87$. The effect was partly caused by difference across clusters: $F(3, 221) = 2.96, p = .034, \eta^2_p = .05$, although the power is low (.70). Gender's effect was more robust: $F(1, 185) = 8.28, p = .009, \eta^2_p = .04, \text{power} = .82$. The interaction did not contribute ($p = .65$). As you can see in **Figure 30**, males showed higher Pragmatic Thinking than females, and in both genders the children of cold-distant fathers had lower scores than those of the other three types of fathers. Clusters of paternal behaviors and gender did not discriminate in Ss' TAS-20 total score [$F(7, 185) = 1.07, p = .38$].

In HGSHS:A Observer-scores, a main effect was detected: $F(7, 222) = 2.08, p = .04, \eta^2_p = .06, \text{power} = .79$. Neither gender ($p = .06$), nor cluster \times gender interaction ($p = .14$), but the difference across paternal types was significant: $F(1, 222) = 2.98, p = .03$, although with a rather small effect: $\eta^2_p = .04$, and not in a reliable way: $\text{power} = .70$. It seems that children of cold-distant fathers are more susceptible to hypnosis than those who recalled a warm-supportive father, to a small but significant extent (Hochberg's GT2 $p = .025$): You can see this pattern in **Figure 31**. In HGSHS:A self-scores, however, no effect was found: $F(7, 222) = 1.26, p = .27$.

Fathers' rearing style and gender did not exert a remarkable influence on AIM+ scores: $F(7, 222) = 1.33, p = .24$. Analysis of the effect of these on AIM- scores was problematic. Although the main effect was not significant: $F(7, 222) = 2.03, p = .052$, neither powerful enough: $\eta^2_p = .06, \text{power} = .78$, the interaction parameter itself proved to be significant: $F(3, 222) = 4.49, p = .004, \eta^2_p = .06, \text{power} = .88$. Conducting separate Kruskal-Wallis analyses for the genders did not reveal any difference in AIM- scores across paternal styles. The effect may be attributed to the difference between male and female Ss who reported about average-controlling fathers: Among them, men felt much more negatively about the hypnotist ($M = 9.2, SD = 1.08$) than the females ($M = 4.88, SD = 0.83$). No difference was found in AIM Admiration and Bonding scores: $F(7, 222) = 0.45, p = .87$. AIM Fear of Negative Appraisal scores, on the other hand, were remarkably different across genders and clusters, and even an interaction effect was found. The overall effect was $F(7, 222) = 2.92, p = .006, \eta^2_p = .084, \text{power} = .93$; the effect of paternal rearing style was $F(3, 222) = 4.43, p = .005, \eta^2_p = .06, \text{power} = .87$. The contribution of gender was less robust, $F(1, 222) = 4.92, p = .028, \eta^2_p = .02, \text{power} = .60$, just like that of the interaction: $F(3, 222) = 3.12, p = .03, \eta^2_p = .04, \text{power} = .72$. As you can see in **Figure 32**, maybe again those Ss "make" the difference who recalled average-controlling fathers: Among them, men showed greater fear that thy hypnotist would be dissatisfied with their hypnotic performance than women. In AIM Need for Dependence, no gender + paternal cluster effect was found: $F(7, 222) = 1.50, p = .17$.

Paternal clusters and gender did not make any difference in PCI Dissociative Control scores: $F(7, 222) = .077, p = .61$. No effect was found for either Positive Affects, $F(7, 222) = 1.18, p = .32$, or Negative Affects, $F(7, 222) = 1.34, p = .23$, associated with altered consciousness. PCI Visual Imagery scores [$F(7, 222) = 1.04, p = .41$] and Attention to Internal Processes [$F(7, 222) = 0.60, p = .75$] were also uninfluenced by the Ss' gender and by their father's recalled behavior.



Figures 30, 31 (upper row), 32, 33 (middle row), 34, 35 (lower row) | Effect of gender and parental rearing style clusters on mentalization skills and hypnotic response. *Note.* Error bars indicate 95% confidence intervals.

Summing the above results, we can say that paternal styles have a mediocre effect (i.e., they don't make much difference) 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.

Let us turn now to how clusters of maternal styles and gender influenced the outcome variables. The entire model [$F(7, 237) = 2.26, p = .03, \eta^2_p = .06, \text{power} = .83$], and to a lesser extent, clusters of maternal behavior [$F(3, 237) = 3.43, p = .02, \eta^2_p = .04, \text{power} = .77$] made a difference in ECS Positive scores, although—as you can see in **Figure 33**—the effect is very small. In ECS Negative, there was a general effect [$F(7, 237) = 9.33, p > .001, \eta^2_p = .22, \text{power} > .99$], but it was conveyed mainly by gender [$F(1, 237) = 53.78, p < .001, \eta^2_p = .19, \text{power} > .99$]. The same pattern was found for ECS Total scores: within the general effect [$F(7, 237) = 7.26, p < .001, \eta^2_p = .18, \text{power} > .99$], just gender acted as a discriminator [$F(1, 237) = 36.80, p < .001, \eta^2_p = .13, \text{power} > .99$].

In RMET, maternal styles and gender together had a significant effect: $F(7, 235) = 2.85, p = .007, \eta^2_p = .08, \text{power} = .92$; this effect could not have been attributed to clusters ($p = .10$) or to gender ($p = .44$), but to the cluster \times gender interaction: $F(3, 235) = 3.49, p = .02, \eta^2_p = .04, \text{power} = .76$, although this effect is not robust. It seems that daughters of average-controlling mothers performed somewhat better than sons; while sons of cold-controlling mothers obtained higher scores than the daughters of such mothers.

Although the overall effect for TAS-20 Difficulty in Identifying Feelings was not significant [$F(7, 200) = 2.03, p = .053, \eta^2_p = .07, \text{power} = .78$], there was a difference across maternal clusters: $F(3, 200) = 3.12, p = .04, \eta^2_p = .04, \text{power} = .42$. Therefore I repeated the analysis without separating the genders, using one-way ANOVA. When the gender was not included in the analysis of variance, it yielded a significant result, $F(3, 204) = 2.66, p = .04$, indicating a small, but robust effect: $\omega = .15, \text{power} > .99$ (**Figure 34**). *Post hoc* Hochberg's GT2 tests suggested that children of the average-controlling mothers were more alexithymic than those of warm-supportive ($p = .007$) or cold-permissive ($p = .047$) mothers. Gender and mothers' rearing style did not make a difference in TAS-20 Difficulty in Describing Feelings [$F(7, 200) = 1.16, p = .33$] scores. In Pragmatic Thinking, the overall effect missed to reach adequate significance or power: $F(7, 200) = 2.04, p = .052, \eta^2_p = .07, \text{power} = .78$, but gender made a difference: $F(1, 200) = 9.29, p = .003, \eta^2_p = .044, \text{power} = .86$. The sons of all types of mothers showed more pragmatic thinking than the daughters. TAS-20 Total scores showed no divergence across genders or mother clusters [$F(7, 200) = 1.20, p = .30$].

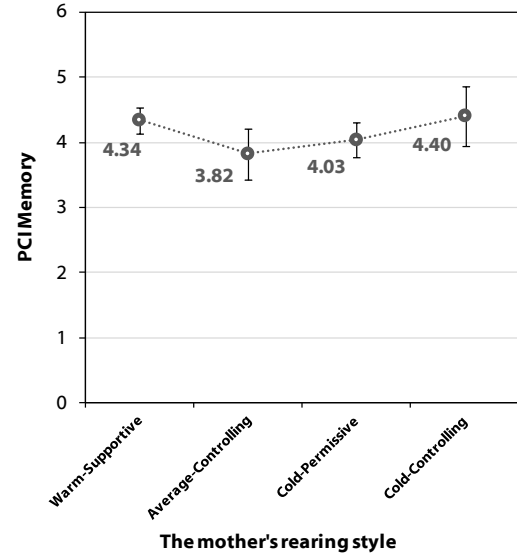
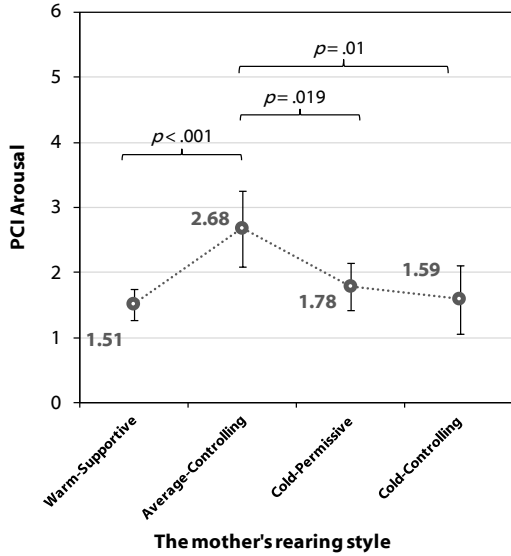
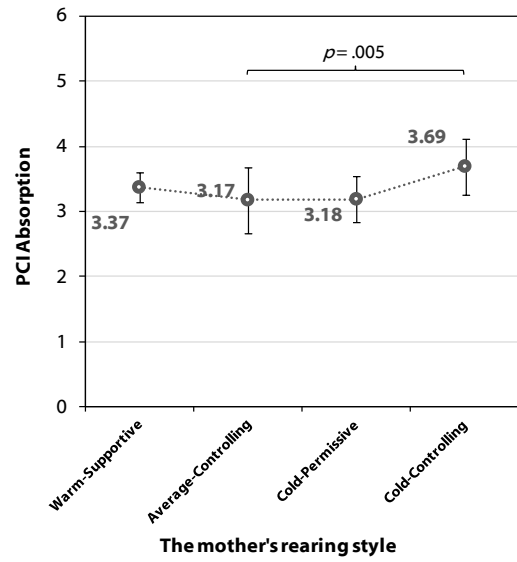
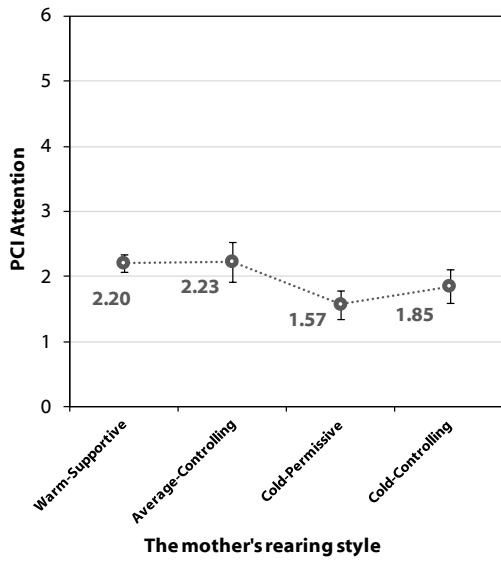
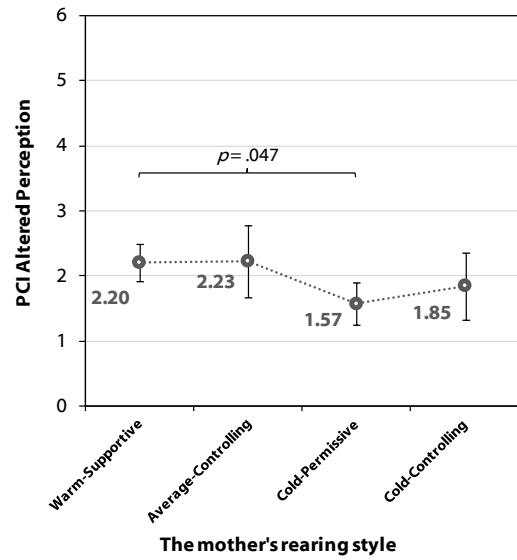
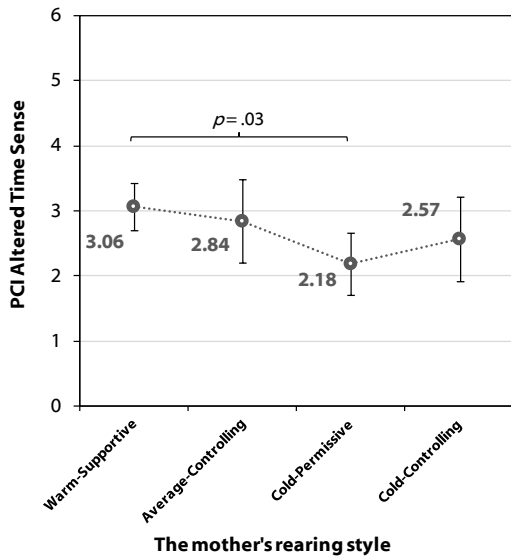
Female and male children of mothers with different parenting styles did not exhibit deviations in their hypnotizability, assessed by either HGSHS:A Observer-scores [$F(7, 238) = .051, p = .82$] or by Self-scores [$F(7, 238) = 0.47, p = .86$]. No difference was detected in their AIM scores. For AIM+: $F(7, 238) = 0.45, p = .87$; for AIM-: $F(7, 238) = 1.00, p = .43$; for AIM Admiration and Bonding: $F(7, 238) = 0.42, p = .89$; for AIM Fear of Negative Appraisal: $F(7, 238) = 1.69, p = .11$; for AIM Need for Dependence: $F(7, 238) = 0.95, p = .47$. It seems that mothers' groups of different parenting styles make absolutely no difference in the way their children respond to hypnosis in terms of behavior or transference towards the hypnotist.

A similar pattern was observed in the children's PCI, Dissociative Control subscale: $F(7, 238) = 0.29, p = .96$, and Positive Affects associated with altered consciousness: $F(7, 238) = 0.79, p = .60$. A full effect was found, however, for Negative Affects. The overall effect was significant, robust and medium sized: $F(7, 238) = 3.96, p < .001, \eta^2_p = .11, \text{power} = .98$. The partial effect of gender was also quite robust: $F(1, 238) = 12.05, p = .001, \eta^2_p = .05, \text{power} = .93$. Part of the effect conveyed by the differences among the maternal clusters seemed to be less powerful: $F(1, 238) = 2.92, p = .035, \eta^2_p = .035, \text{power} = .69$. The interaction parameter, albeit significant, was also mediocre: $F(3, 238) = 3.00, p = .03, \eta^2_p = .04, \text{power} = .70$. Female Ss, apart from their mother's behavior patterns, seem to feel more negative about hypnosis (compare this observation with **Figure 22**, which shows such data for the entire sample). Nevertheless, maternal behavior (and its interaction with the Ss' gender) may still count to some extent. While children of Warm-Supportive mothers showed almost exactly same levels of Negative Affect, the daughters of Average-Controlling mothers felt somewhat more negative about hypnosis than the sons. When the difference was ana-

lyzed without splitting the data for gender, a robust effect was found: $F(3, 245) = 3.37, p = .02, \omega = .16$, power $> .99$. This effect is presented in **Figure 35**. Post hoc Hochberg's GT2 tests suggested that the children of the Average-Controlling mothers experienced more negative feelings under hypnosis than those of Warm-Supporting mothers ($p = .015$). Gender and mother cluster had a significant influence on PCI-5 Visual Imagery: $F(7, 238) = 2.15, p = .04, \eta^2_p = .06$, power = .81. The effect was mostly caused by the cluster \times gender interaction: $F(3, 238) = 3.65, p = .013, \eta^2_p = .04$, power = .80. Gender ($p = .46$) and clusters ($p = .87$) did not play a role in the effect. While daughters of cold-controlling mothers experienced more visual images than the sons, for the other three maternal styles, men reported higher levels of imagery. PCI-5 Attention to Internal Processes was not influenced by maternal style and gender: $F(7, 238) = 1.63, p = .13$.

The difference in PCI-5 Negative Affect raised the possibility that Ss may also differ across their mother's recalled parenting style in other phenomenological dimensions of hypnosis. To check these effects, I conducted one-way ANOVA on the PCI 14+12 factors. Six aspects of hypnotic phenomenology seemed to be influenced by the recalled maternal rearing style. A difference was detected in Altered Time Sense: $F(3, 242) = 2.90, p = .04, \omega = .15$, power $> .99$. As you can see in **Figure 36**, those with warm-supportive mothers reported significantly higher alteration in their time perception than those who recalled cold-permissive mothers. In Altered Perception, an effect of $F(3, 242) = 2.78, p = .04, \omega = .15$, power $> .99$ was detected: Again, those who had warm-supportive mothers, had significantly higher alteration in perception under hypnosis than those who evaluated mothers as cold-permissive (**Figure 37**). In Attention, the magnitude of effect was similar: $F(3, 242) = 3.44, p = .02, \omega = .17$, power $> .99$. No significant difference was observed across maternal styles (**Figure 38**). Subjects recalling different maternal styles also experienced different levels of Absorption: $F(3, 242) = 4.08, p = .01, \omega = .19$, power $> .99$. Children of Cold-Controlling mothers felt significantly higher absorption than those of Average-Controlling mothers (**Figure 39**). Subjects also differed in the level of Arousal they experienced: $F(3, 242) = 6.44, p < .001, \omega = .25$, power $> .99$. As you can see in **Figure 40**, Ss who recalled Average-Controlling mothers felt more aroused under hypnosis than those whose mothers belonged to the other rearing style clusters. Finally, there was a general effect of maternal rearing style on Memory: $F(3, 242) = 2.82, p = .04, \omega = .15$, power $> .99$. Although no differences were detected among specific groups, it seems that the children of Average-Controlling mothers felt the lowest, while those of Cold-Controlling mothers the highest changes in how their memory worked under hypnosis (**Figure 41**). Although these effects, based on omega values, have small-medium magnitude, they generally suggest that the children of the controlling but not especially emotional mothers felt the least favorable under hypnosis (experiencing more negative feelings and being more aroused than the others, and also retaining their attention), while the children of controlling and emotionally unresponsive mothers were the most absorbed in hypnosis.

In general, some differences were observed around parental clusters, which show 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. In the Discussion we will get back to this topic; for now, let me just note that although the Ss expressed different levels of love toward their parents in different clusters, the love ratings—especially for mothers—were not as much *polarized* as we would expect if subjects with severe neglect or parental abuse had been involved in the study. If you compare **Figures 28** and **29**, you will notice that clusters of maternal behavior show greater overlap and less discrimination between cases falling into different clusters than the evaluations of the father's parenting style. Certainly, we cannot know what kind of experiences these Ss actually had in their childhood, nevertheless, it must be remembered that it was a recruitment criterion for the Ss to be mentally and physically healthy, and that they participated in the research voluntarily. They and their parents most probably belong to the "normal" range of child-parent relationship. Therefore, the parents of these Ss, even if they can be categorized into clusters, *may not be*, and may not be *perceived* to be *as different* from each other, as if we had asked schoolchildren or subjects from a clinical sample to evaluate their own parents with the questions of EMBU.



Figures 36, 37 (upper row), 38, 39 (middle row), 40, 41 (lower row) | Effect of gender and parental rearing style clusters on mentalization skills and hypnotic response. *Note.* Error bars indicate 95% confidence intervals.

9.4. Any Chance for Mediation?

Data presented in the previous sections show that there are some low-to-medium effect relationship between recalled parenting styles, mentalizing capacity, and dimensions of hypnotic susceptibility. Although I had expected that clusters of parental style will better predict these 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 the following variables:

- Father Punishment → Negative Emotional Contagion
- Father Punishment → Difficulty in Identifying Feelings
- Mother Punishment → Difficulty in Identifying Feelings
- Mother Overprotection → Difficulty in Identifying Feelings
- Father Overprotection → Overall Alexithymia

- Father Punishment → Positive Archaic Involvement towards the hypnotist
- Father Punishment → Negative Archaic Involvement towards the hypnotist
- Mother Punishment → Negative Archaic Involvement towards the hypnotist
- Father Punishment → Fear of Negative Appraisal from the hypnotist
- Mother Punishment → Fear of Negative Appraisal from the hypnotist
- Father Punishment → Negative Affect in hypnotic state
- Mother Punishment → Negative Affect in hypnotic state

- Difficulty in Identifying Feelings → Hypnotizability (Observer- and Self-scores)
- Overall Emotional Contagion → Hypnotizability (Observer- and Self-scores)
- Overall Emotional Contagion → Positive Archaic Involvement towards the hypnotist
- Difficulty in Identifying Feelings → Positive Archaic Involvement towards the hypnotist
- Difficulty in Identifying Feelings → Negative Archaic Involvement towards the hypnotist
- Difficulty in Identifying Feelings → Fear of Negative Appraisal from the hypnotist
- Difficulty in Identifying Feelings → Dissociation in hypnotic state
- Pragmatic Thinking → Positive Affect in hypnotic state
- Difficulty in Identifying Feelings → Negative Affect in hypnotic state
- Negative Emotional Contagion → Negative Affect in hypnotic state
- Positive Emotional Contagion → Negative Affect in hypnotic state
- Difficulty in Identifying Feelings → Increased Inward Attention in hypnotic state

If you study the pattern of these causal associations you can notice that in general, they suggest that punishing-controlling parental behavior predicts alexithymic affective processing: the more control and punishment the S recalled (from either parents), the more difficulty s/he reported in identifying her or his emotions. This kind of parental behavior also had an effect on the Ss' emotions to the hypnotist and her/his affective experiences under hypnosis. For more punished Ss, hypnosis had meant a more negative situation, maybe because they felt more fear about the hypnotist. It seems a rational explanation that, if the hypnotic situation resembles to early object relationship, the hypnotist may appear as an authority figure. Those subjects who were frequently punished and highly controlled in their childhood may be more concerned about pleasing the hypnotist and not to make her or him angry, dissatisfied with their hypnotic performance.

Some elements of mentalization, especially emotional contagion and difficulty in identifying feelings, seem to be associated with both punishing parental behavior and negative/fearful reactions to hypnosis. It also seems a reasonable explanation that frequently punished children develop alexithymia, especially a hardship in recognizing and adequately labeling her or his emotions. Emotions—both love and hate towards the strict-controlling parent—may be “dangerous”; this may be one of the reasons for alexithymic people to fear and avoid social situations. Somewhat in contrast

to the above explanation, severely punished children may develop a high level of vigilance to their interaction partners' emotions, as it may had helped them to recognize if the strict parent was in "bad mood" or angry. That can be the reason for their proneness to automatically take and mimic the negative emotions of other people. Children of frequently punishing and controlling parents may become adults who feel worse in hypnosis and have more fear of the hypnotist *not just* because the hypnotist is like the bad parent (indeed, s/he can act many cases as good parent, so s/he also evokes positive emotions in these Ss!), but also because they may tend to be confused by the transference emotions towards the hypnotist and/or because of their hypervigilance to negative feelings. They will also have to monitor themselves to follow the internal processes, which may help them in understanding and handling the interpersonal (hypnotic) situations and in regulating their emotions. Strict-punitive parental behavior, therefore, may also lead to higher self-monitoring in hypnosis directly and via the mentalization processes identified above. In other words, these aspects of mentalization may *mediate* between parental rearing style and hypnotic response. This seems to be congruent with the hypothesis I outlined in Section 3.4 on the relationship of parental rearing style, mentalization and hypnotic response. In the light of the above findings, **Figure 1** can be reformulated in the following way:

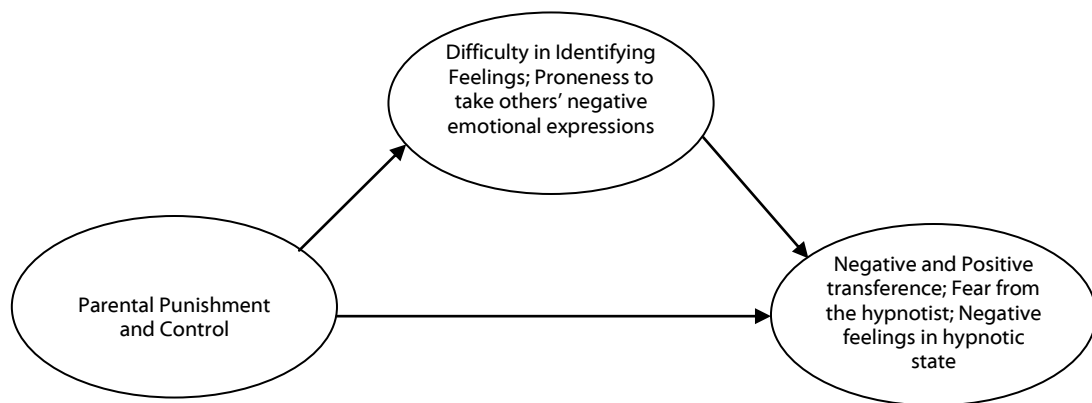


Figure 42 | Alexithymic affective processing and negative emotional contagion may mediate between parental punishment / control and transference feelings to the hypnotist / negative experiences in hypnosis

To check whether the mentalization skills mediate between parenting style and hypnotic responses, mediation analyses were conducted, involving all causal links that are listed on the previous page. The general scheme for mediation (in the statistical sense) is depicted in **Figure 43**.

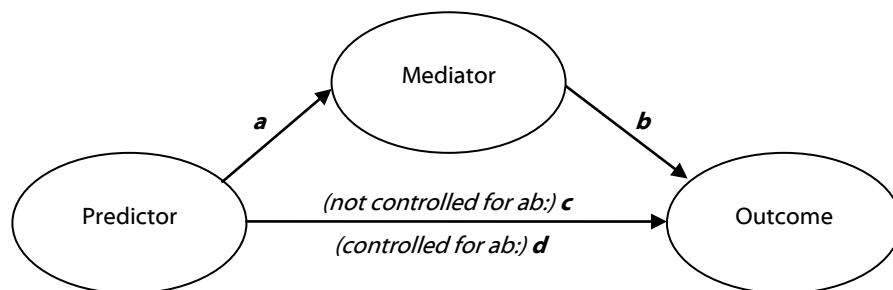


Figure 43 | Statistical mediation. Letters *a*, *b*, *c* and *d* refer to unstandardized (raw) regression coefficients (*B*).

According to [Baron and Kenny \(1986\)](#), mediation effect occurs if

- The predictor variable explains some part of the variance in the hypothesized mediator (i.e., the path marked with a is significant);
- The mediator accounts for a significant part of variability in the outcome variable (path b); and
- The predictor's effect on the outcome (marked with c) is significant; but
- if we control it to the hypothesized indirect effect ($a \cdot b$) (this controlled path is marked with d), it will loosen its significance (full mediation), or at least its effect will be lower than the uncontrolled one.

Full mediation indicates a very strong effect. Baron and Kenny emphasizes that in psychology, due to the multiple determination of almost all phenomena, we are more realistic if we are just expecting a partial mediation (i.e., in terms of standardized regression coefficients, $\beta_d < \beta_c$). The statistical measure of mediation effect is the Sobel- z statistics ([Sobel, 1982](#)):

$$z = \frac{a \cdot b}{\sqrt{(a \cdot SE_a)^2 + (b \cdot SE_b)^2}} \quad (4)$$

Where a and b are unstandardized regression coefficients, while SE_a and SE_b are their standard errors. We can tell that a mediation effect was found if z is significantly higher than 1.96. Based on their standardized beta values, we can also calculate the indirect effect: $\beta_a \cdot \beta_b$. Finally, we can also simply compute the proportion of the predictor \rightarrow outcome effect which is caused by the mediation ([Beckstead, 2009](#)):

$$\text{Mediation}\% = \frac{c-d}{c} \quad (5)$$

Where c and d represent the predictor \rightarrow outcome path, uncontrolled and controlled for the mediation.

Although the standardized indirect effect tells about how “big” or “small” is the mediation, it is not informative about the magnitude of the effect. Unfortunately, traditional effect size calculations and estimation methods for statistical power cannot be applied to mediation analysis ([Preacher & Kelley, 2011](#)).³⁰

Mediation effects were calculated in the following way. First, I computed all regression analyses on the above presented list of possible casuistic links between predictor (parental style), mediator (mentalizing skills) and outcome (hypnotic response variables). The so obtained unstandardized regression coefficients, their standard errors, and the standardized beta values were analyzed with the method of [Beckstead \(2009\)](#).

As you can see in the next two pages, after checking for all assumed causal links, six robust mediation effects were found. Both fathers' and mothers' punishing behavior seemed to influence negative emotions towards the hypnotist, fear of that the hypnotist will 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 \rightarrow negative archaic involvement pathway, involving that of paternal (**Figure 44**) and maternal (**Figure 47**) punitive behavior. Those Ss who were 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.

³⁰ [Preacher and Kelley \(2011\)](#) and others as [Fritz and MacKinnon \(2007\)](#) and [Hayes \(2009\)](#) warn to the drawbacks of the [Baron and Kenny \(1986\)](#) approach. We will return to some of their concerns and suggestions in the Discussion.

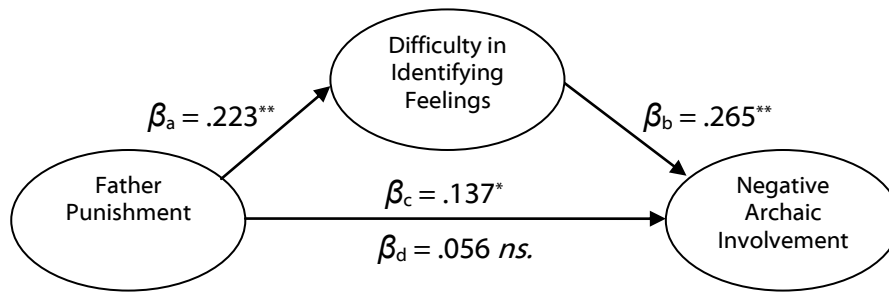


Figure 44 | TAS-20 Difficulty in Identifying Feelings fully mediates the Paternal Punishment → AIM Negative link. Sobel's $z = 2.632, p = .008$, standardized indirect effect = .059, mediation = 61.6%.
Note. * $p < .05$. ** $p < .005$.

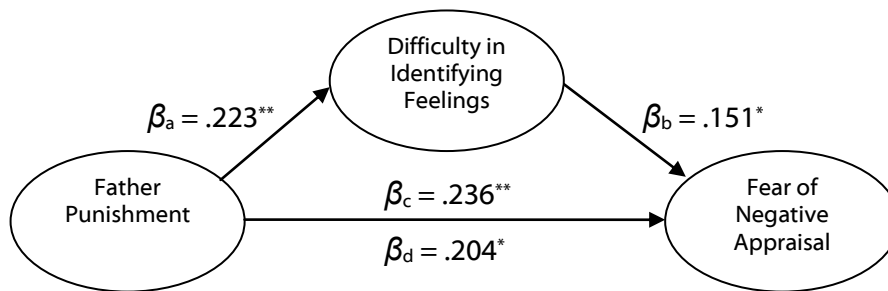


Figure 45 | TAS-20 Difficulty in Identifying Feelings partially mediates the Paternal Punishment → AIM Fear of Negative Appraisal link. Sobel's $z = 2.049, p = .04$, standardized indirect effect = .034, mediation = 16.9%.
Note. * $p < .05$. ** $p < .005$.

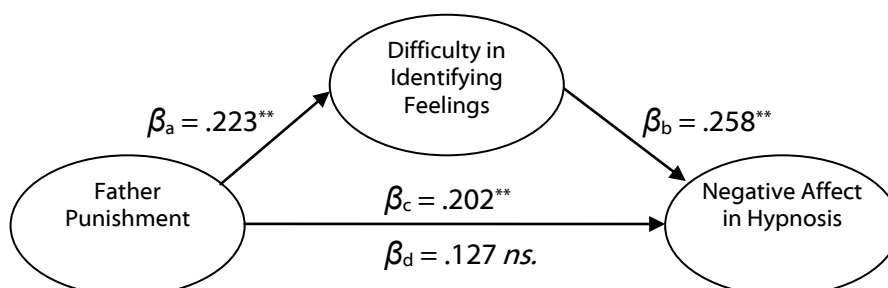


Figure 46 | TAS-20 Difficulty in Identifying Feelings fully mediates the Paternal Punishment → PCI-5 Negative Affect link. Sobel's $z = 2.613, p = .009$, standardized indirect effect = .058, mediation = 37.6%.
Note. * $p < .05$. ** $p < .005$.

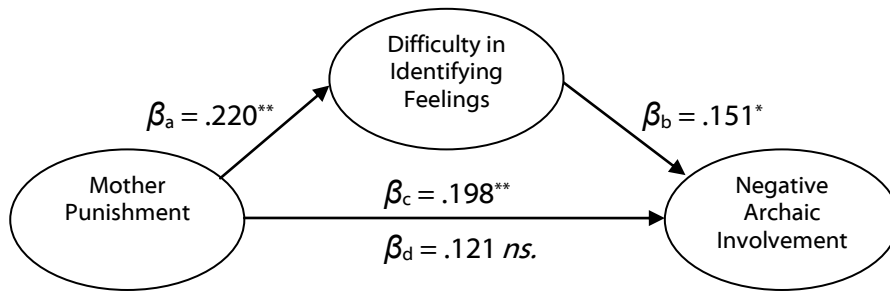


Figure 47 | TAS-20 Difficulty in Identifying Feelings fully mediates the Maternal Punishment → AIM Negative link. Sobel's $z = 2.679$, $p = .008$, standardized indirect effect = .058, mediation = 42.9%.
Note. $^{**}p < .005$.

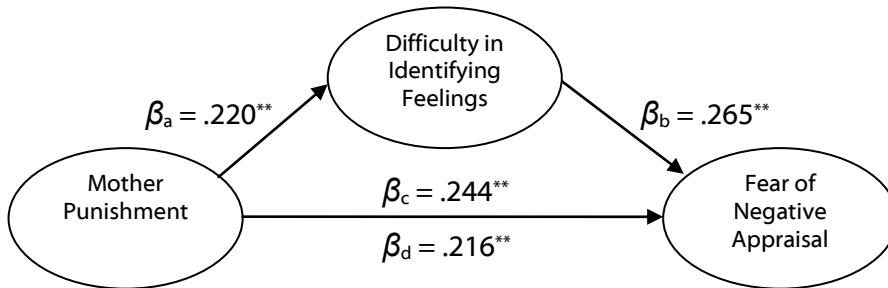


Figure 48 | TAS-20 Difficulty in Identifying Feelings partially mediates the Maternal Punishment → AIM Fear of Negative Appraisal link. Sobel's $z = 2.071$, $p = .038$, standardized indirect effect = .033, mediation = 16.9%.
Note. $^*p < .05$. $^{**}p < .005$.

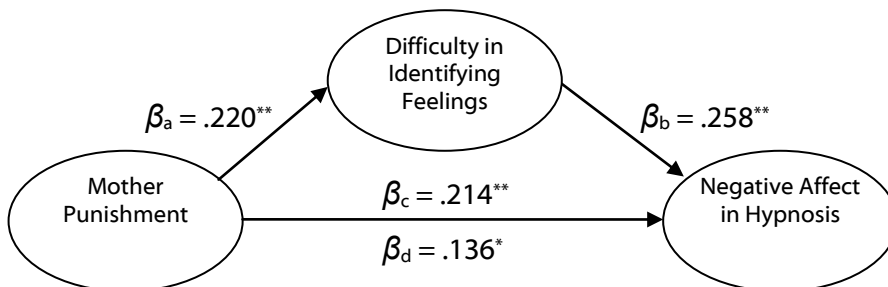


Figure 49 | TAS-20 Difficulty in Identifying Feelings partially mediates the Maternal Punishment → PCI-5 Negative Affect link. Sobel's $z = 2.659$, $p = .008$, standardized indirect effect = .057, mediation = 37.1%.
Note. $^*p < .05$. $^{**}p < .005$.

Children recalling more punishment (from their fathers and mothers) reported about 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 45**, mothers: **Figure 48**).

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 46**); difficulty in emotional processing was a partial mediator between maternal punishment and negative experiences in hypnosis (**Figure 49**).

These results, in general, show that alexithymia (at least its sub-dimension of decreased ability for affective processing) influences the relationship between punishment the Ss recalled and the negative feelings they had in hypnosis. While parental overprotection also affects alexithymia and alexithymia modifies behavioral hypnotizability, dissociation and inward attention under hypnosis, in these cases, alexithymic processing did not show any mediating effect; nor did propensity for negative emotional contagion. It sounds, however, a reasonable explanation that Ss who recall that they were punished in their childhood may develop alexithymia; alexithymic processing of emotions, on the other hand, may lead to fear from and negative feelings about both the hypnotist and the hypnotic situation. Therefore parental punishment may not just directly affect negative experiences in hypnosis, but also through the mediating effect of alexithymia.

9.5. Mentalization and hypnotic response in the function of family structure, primary caretakers, and having siblings

In Section 2.4 on parental behavior and hypnotic response I mentioned that some (rather initial) observations support that alexithymia is associated with family issues and disruption in family structure ([Lumley et al., 1996](#); [Joukamaa et al., 2007](#)). Some of our Ss, in an earlier phase of the investigation ([Költő, 2008](#)), made remarks of these issues making them difficult to understand and respond to the EMBU questionnaire. For instance, they did not know if they shall respond to items in regard to a step-parent, or a life-partner of their mothers or fathers. [Heller \(2011\)](#) observed that only children had higher hypnotizability than those who had siblings. These results inspired me to examine how mentalization skills and hypnotic response are influenced by the following issues:

- The intactness of family structure: whether the subject was brought up by the same caretaker(s) during her or his entire (or largest part of) childhood or did it change who raised her or him. As **Table 12** shows, the large majority of the subjects (around 85%) were raised in an intact family; nevertheless, 8% experienced some change, and for another 8%, it changed in the course of the childhood who raised them.
- Who was or were the primary caretaker(s) of the subject: was s/he raised by biological parents, one biological parent alone, a biological parent and her or his life partners, or other person(s). **Table 13** demonstrates that most of the children (around 87%) were brought up by their biological parents together; another 8% by the mother alone, and the remaining 5% by others. Due to these imbalanced proportions, I will compare those who were raised up by both biological parents to all other Ss.
- If the subject had any siblings or was an only child.³¹ In the present sample, 37.3% of the Ss reported about having siblings.

Raised by the same caretakers during the childhood or not made no difference in measures of mentalization ($0.19 \leq F \leq 2.19$, $.11 \leq p \leq .83$). Family structure did not make a difference in HGSHS:A Observer-scores: $F(2, 244) = 0.89$, $p = .41$, but discriminated between Self-scores: $F(2, 244) = 3.36$, $p = .04$, although the effect size was small: $\omega = .14$, power = .95. **Figure 50** shows that those who experienced a break in the family structure in their childhood exhibit lower hypnotizability than those who lived in stable (Hochberg's GT2 $p = .03$) or relatively stable family ($p = .01$).

³¹ This information was derived from the Ss' responses on Item 15 of EMBU ["I felt that my parents liked my brother(s) and/or sister(s) more than they liked me"]. The S had just to answer these questions if s/he had any siblings, which made it possible to assign all Ss into categories of a binary variable whether s/he had siblings or not.

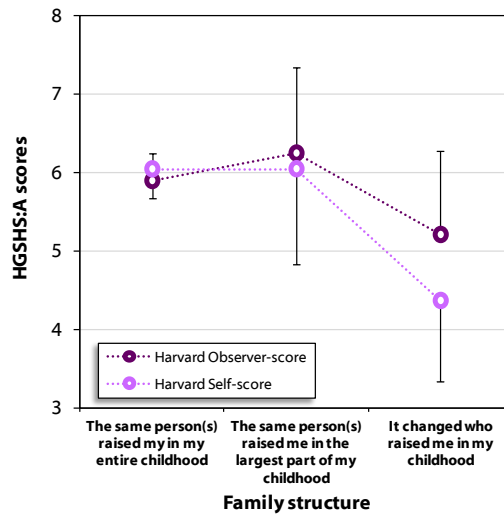


Figure 50 | Hypnotizability across family structures ($N=565$)

Differences were also found in archaic involvement: for AIM+, $F(2, 244) = 4.43, p = .01, \omega = .16$, power > .99. Those Ss who were raised up in the largest part of their childhood by the same caretaker(s) but then the situation changed, expressed the highest, while those who experienced family instability the lowest positive transference towards the hypnotist. For AIM Negative, no difference was detected: Kruskal-Wallis $\chi^2(2) = 4.86, p = .09$. In AIM Admiration and Bonding scores, K-W $\chi^2(2) = 8.09, p = .02$, although the low value of power³² (0.16) show that the difference is not robust. In AIM Fear of Negative Appraisal, no difference was observed: $F(2, 244) = 2.69, p = .07$. In AIM Need for Dependence, $F(2, 244) = 5.21, p = .006, \omega = .18$; but power = .23 shows that the result is unreliable. It seems that in general, children from unstable families experience somewhat more polarized feelings towards the hypnotist. In phenomenological experiences, no deviations emerged across family stability.

Having a sibling ($n = 211$) or not ($n = 35$) made no difference either in ECS, RMET or TAS-20 scores ($-0.53 \leq t \leq 1.25, .21 \leq p \leq .97$), or in measures of hypnotic response ($-0.53 \leq t \leq 1.25, .21 \leq p \leq .97$).

9.6. Summary

In the above chapter, three techniques were applied to investigate whether parental rearing style affect mentalizing skills and hypnotic response, and a fourth one to check if the three constructs are interrelated (i.e., if mentalization skills mediate between variables of parental rearing and hypnotic susceptibility). It was checked if family stability, the primary caretakers and having or not having any sibling made any difference.

First, correlations and multiple linear regression analyses were conducted. These revealed that the children of cold-controlling and distant parenting styles (those who were recalled to show high rejection, high overprotection and punishment but low emotional warmth toward the child) were associated with the child's higher propensity to negative emotional contagion and higher risk of being alexithymic (especially showing difficulties in identifying emotions). Correlations analyzed in gender breakdown and multiple regression equations showed that gender and the parent-child gender interaction play a role in many of these associations: for instance, daughter of cold-

³² Values of statistical power were calculated for the respective ANOVAs, then corrected for .955 asymptotic relative efficiency of the Kruskal-Wallis test (see Section 5.6.4 on calculating power and effect sizes).

rejective, overprotective and punitive fathers showed higher behavioral hypnotizability. On the contrary, sons of cold-controlling fathers demonstrated higher positive and negative archaic involvement towards the hypnotist, suggesting that the emotional relationship with the hypnotist may even bear some levels of ambivalence (at least for those men who were treated coldly and strictly).

These associations suggested that it is not single variables but rather patterns of parental behavior that determine mentalizing and hypnotic response. Therefore I conducted a cluster analysis on parental variables. Both fathers and mothers could have been meaningfully categorized on the cold–warm and the controlling–supporting dimensions, although there were types of both parents who showed “average” level of emotional warmth and high control; and instead of “cold-controlling”, fathers could rather have been typologized of “cold-distant” (showing low emotional warmth and low overprotection). These types, somewhat against the expectations, made not very high differences in Ss’ mentalizing and hypnotic performance. Still, daughters of cold-distant fathers showed the highest hypnotizability; children average-controlling mothers were the most alexithymic and felt the most negatively under hypnosis; maternal rearing style had lead to different phenomenological experiences under hypnosis (in general, children of cold mothers showed more negative feelings but higher absorption, and maintained higher attention than those of other kinds of mothers).

Finally, it was checked if mentalizing skills mediate between parental rearing style and hypnotic response: a stable mediation effect was found, irrespective of the gender of the parent. High levels of parental punishment was associated with more negative feelings under hypnosis, both in the phenomenological and the emotional fields; children of punitive parents expressed more fear that the hypnotist will be displeased with them. These links were partially or fully mediated by alexithymic affective processing, i.e. difficulty in identifying someone’s own emotions. These results suggest that for frequently punished subjects, it is not the parental punishment which causes that they feel bad under hypnosis (and feel negative about the hypnotist) but that they are confused about what are they actually feeling. This mediation effect may have deep impact on the course and the efficacy of hypnotherapy, which—along with the other findings—will be discussed in the next, closing chapter.

Those who experienced disruption in family structure during their childhood, were more hypnotizable and showed more polarized transference feelings towards the hypnotist than those who were raised up in a stable family. Who was their primary caretakers or had they have any siblings did not made a difference in their mentalization skills or in their hypnotic response. The question of family background, however, needs further and more detailed investigation.

10. DISCUSSION

WHAT CONCLUSIONS CAN WE DRAW from the many findings presented in the previous chapters? Let us first check if the empirical data presented in the above chapters confirm or disprove my hypotheses. In the present Discussion, first I will summarize the findings supporting and/or contradicting the validity and reliability of the applied measures. Then I will recall the research questions and hypotheses formulated in Chapter 4 about the aims and scope of the thesis, and we will review my findings that can answer the respective questions and falsify or support the assumptions.

As I mentioned in the first chapters, parental rearing style and mentalization can be issues basically in all mental and psychosomatic health problems. Hypnotherapy, on the other hand, may (at least partly) work through by putting these problematic aspects into focus. The clinical relevance of the findings will be discussed in a separate section. Gender differences, from the perspective of social constructivism and evolutionary psychology, will also be reviewed.

After discussing these issues, some limitations of my investigation will be described. These include the recruitment of a non-clinical sample (and many psychology students), availability sampling instead of stratification techniques, and the question if adequate measures and statistical methods had been applied (with a subjective note on significance, power, and effect sizes). Finally, some possible ways of future research will be presented.

10.1. Reliability and Validity of the Applied Measures

In general, the tests showed good internal consistency. Confirmatory factor analysis of the EMBU supported the presence of the original 3 factors, Rejection, Emotional Warmth, and Overprotection. The analyses I conducted also justified the use of a fourth, operational subscale: Punishment.

In My Memories of Upbringing (EMBU) questionnaire, the only remarkable difference from an earlier investigation I conducted 7 years ago ([Költő, 2008](#)) was that here the subjects recalled mothers as less rejective, overprotective, and punishing. It has to be considered, however, that in the earlier study, Ss were much younger. If you check Figures 8a and b and Figures 27a and b you can notice that the love the subjects felt toward their parents at the time of filling in EMBU was greater than what they recalled from their teenage. This difference could be observed in all groups of parental styles. It seems that the Ss felt “more” love toward their parents as time passed. Maybe as we grow older, we compare ourselves to others about how they recall their parents, and having our own children, we become more “forgiving” towards our parents. Adolescents may be too critical with their parents, simply because they search for ways of differentiating their identity from the parental example ([Erikson, 1950](#)). This may also be reflected in EMBU scores: Older Ss may evaluate their parents more favorably than younger respondents. In the 2008 study, participants were about 24 years old, while in the current sample, they were around 28. It may not seem to be a great age-difference, but consider that while the great majority of former age group have not graduated from the university yet, many of the latter had already started their “adult” lives, maybe even had their own children, which may make a difference in how they think about their parents. Although reminiscence of the young and the elderly seem to be rather similar than different ([Romaniuk & Romaniuk, 1982](#)), older Ss recalled more memories of their families. In my study, the only medium-sized difference between the 24- and the 28-year old Ss were that the latter group rated their mothers as being less overprotective; for other parental variables, the differences were small-scaled.

Supplementing the EMBU with questions on family structure and primary caretakers seemed to be a useful addition. However, it seems that these questions are not detailed enough. For instance, changes in who raised the subject may be caused by divorce of the parents, or the death of a parent, but these may predict very different outcomes for the psychological development of the subject. Children of divorced parents have less positive memories of them compared to children of intact families ([Webster & Herzog, 1995](#)). In the future, more detailed questions should be used on

the family structure and the caretakers; a good example is the one used in the Health Behaviour in School-aged Children (HBSC) study ([Currie et al., 2012](#); [Németh & Költő, 2011](#)). Birth order ([Buunk, 1997](#)) and the relationship with the siblings may also be relevant in the study of mentalization and hypnosis.

The Emotional Contagion Scale (ECS) was adapted to Hungarian for the present PhD research project. In retrospect, it is a pity that I kept the original, 4 point Likert scale for the responses. Using the reformulated 5 point scoring would have made the results comparable with other studies ([Lundqvist, 2006](#); [Cardeña et al., 2009](#)). Confirmatory investigation of the factorial structure justified the existence of the original 2-factor and 5-factor solutions; however, a Heywood case in the 5-factor solution (Happiness, Love, Fear, Anger, and Sadness) warned that such a structure may be too detailed. Therefore, ECS total scores, and propensity to mimic negative and positive emotional expressions of the interactional partners were used for the analyses. A critique of this questionnaire can be that self-reported emotional contagion may not be as exact as, for instance, measuring physiological reactions like intensity of the electromyographic signal ([Berger & Hadley, 1975](#); [Lundqvist, 1995](#)) while the S observes others in highly emotional states. However, ECS subscales being negatively associated with TAS-20 Pragmatic Thinking suggests that “pragmatism” is less influenced by other people’s emotions. ECS scores, on the other hand, show positive correlation with hypnotizability, archaic involvement, and dissociated experience, suggesting that people who tend to automatically take and mimic others’ emotions show higher involvement in hypnosis. These results show that the scale measures the construct of emotional contagion in a valid way.

The Reading the Mind in the Eyes Test (RMET) yielded very similar mean scores to those observed in the original English and Hungarian versions. The distribution of the scores was also similar to the original, although my data had sharper “shoulders” (were more concentrated around the mean) than in the English version. Somewhat contrary to the study of [Iványi et al. \(2007\)](#), who observed differences in RMET scores across professions, in the present sample, no deviations were detected. The data, however, should be treated with caution. In the live administration of the RMET, the exposure time of the stimuli and the time for selecting the target emotion for the respective eye strip is limited (e.g., ten seconds for observation of each picture, and twenty seconds for deciding which word describes the emotion in the given eye the best). In the Internet administration, Ss had an unlimited time to observe the eyes and to select which response to give. We do not know if this technique makes any difference. Further investigation is needed to check if unlimited time of exposure *versus* a pre-set time frame makes a difference in the RMET responses.

Of the measures covering dimensions of mentalization, the 20-item Toronto Alexithymia Scale has the most empirical evidence supporting its favorable psychometric properties. CFA supported that TAS-20 items constitute three subscales (Difficulty in Identifying Feelings, Difficulty in Describing Feelings and Pragmatic Thinking). Twice as many men (30%) fell within the subclinical range of alexithymia score range as women (16%), which is in line with the masculine ideology that presses males to hide their emotions, to prevent themselves from being feminine or like “sissies” (effeminate gay men). The result of this ideology-driven pressure, according to social constructivist theory, is the normative male alexithymia, which seems to be independent from culture ([Levant et al., 2003](#)). To the best of my knowledge, no large-sample study has been conducted on the alexithymia of the Hungarian population so far. Among Hungarian students, no gender difference was found ([Cserjési et al., 2007](#)); in epidemiological studies, however, similar prevalence can be observed. For instance, in a Finnish study, 10% of the females and 17% of the males obtained a TAS-20 score over the cutoff value indicating alexithymia ([Salminen, Saarijärvi, Ärelä, Toikka, & Kauhanen, 1999](#)).

Convergent validity of the measures I intended to apply for testing mentalization was rather low, in terms of correlations. Especially the Reading the Mind from the Eyes test lacked an association with the other measures. This raises doubts whether this test battery tapped into mentalization sub-skills. Given that RMET was developed to detect autism spectrum disorders, maybe it is not sensitive enough to differentiate in the mentalization of healthy subjects. Other ways of investigation, like interview methods and a more detailed examination of emotional-social skills ([Albu, Gergev, Kárpáti, & Tárnok, 2012](#)) are needed.

Measures of hypnotic responding, in general, showed very favorable psychometric properties and corresponded with earlier normative and large-sample studies. The only apparent exception

was that the Harvard Group Scale of Hypnotic Susceptibility subscales showed low reliability, albeit this result was also in line with earlier findings (Költő et al., 2013). It has to be emphasized, however, that the HGSHS:A total scores, according to the Ss' self-scores and observer-scoring, demonstrated good internal consistence. Actually, one of the main criticisms against HGSHS:A is that it contains an imbalanced combination of suggestions: Those that tap into psychomotor phenomena prevail, while the cognitive perceptual dimensions of hypnosis are underrepresented (Woody & Barnier, 2008). We have good reasons to believe that mentalization—which is more “cognitive” and “perceptual” in nature than “motor”—would show greater associations with hypnotizability measures that tap more into such phenomena. Such methods are the Stanford Hypnotic Susceptibility Scale, Form C (Weitzenhoffer & Hilgard, 1962), the Waterloo-Stanford Group Scale of Hypnotic Susceptibility (Bowers, 1998), and most recently, the Elkins Hypnotizability Scale (Elkins, 2013). It is important to notice that Ss of different hypnotists exhibited different levels of hypnotizability. This effect may interact with professional differences, i.e., psychologists are more hypnotizable than non-psychologists (Költő et al., 2015). The interaction was most probably due to the fact that many undergraduate psychology students were hypnotized by E.E., a well-known researcher and hypnotherapist, who taught them an introductory course in hypnosis (in addition to other courses). In the core sample (with much less psychology students and much less of those Ss hypnotized by E.E.), neither professional difference, nor experimenter effect could be detected. These latter findings correspond with the earlier findings of our laboratory (e.g., Józsa, 2012). Teachers evoke archaic involvement similar in the nature and magnitude to the transference feelings towards the hypnotist (Bányai et al., 2001). This effect, combined with the observations of other hypnosis laboratories that there seems to be a general decrease in hypnotizability over age (Figure 14), can result in biases. This warns us that the very frequent context in hypnosis research projects—namely, that university or college teachers hypnotize their students participating in hypnosis courses—is not an adequate research setting.

The Archaic Involvement Measure (AIM) demonstrated excellent psychometric properties. A mixed factorial structure with 2 first-order factors (Positive and Negative total scores) and three second-order subscales under Positive main scale (Admiration and Bonding; Fear of Negative Appraisal; Need for Dependence) was correctly separated by confirmatory factor analysis. Similarly to HGSHS:A, both professional effect (Psy versus Non-Psy) and experimenter effect occurred in AIM. In accordance with earlier observations and the present findings on HGSHS:A, those psychology student Ss expressed the highest positive transference who were hypnotized by their teacher. We can conclude that their behavioral hypnotizability scores were higher than those of non-psychologists at least partly because they wanted their teacher to “be pleased” by their hypnotic performance. Certainly, other factors may also contribute to this effect; for instance, the cognitive style of psychologists is more holistic than analytic, which is associated with higher hypnotizability (Morgan, 1972); psychologists have more (and more accurate) prior knowledge about hypnosis than non-psychologists; they are more eager to try altered states of consciousness; and the observers may also be less stringent with them than with non-psychologists, resulting in higher observer-scores (Költő et al., 2015). The latter explanation is supported by the fact that the difference in HGSHS:A self-scores had a smaller effect size ($r_{ES} = .09$) than in observer-scores ($r_{ES} = .15$).

Both the original 26-factor (14 second-order and 12 first-order factors) and the reformulated 5-factor solutions of the Phenomenology of Consciousness Inventory proved to be reliable. Although both models seemed to be adequate for further analysis, the five main scales were developed with the very purpose of substituting the ponderous data set with 26 variables (Kumar et al., 1996). There is an important difference between the way Pekala & Kumar and we administered the PCI after standard laboratory hypnosis sessions. Pekala & Kumar usually insert a relatively short period in the standard hypnosis sessions (before dehypnosis) when the Ss just have to sit silently for a couple of minutes, and the Ss have to fill in the PCI with respect to this time interval. In our laboratory, the Ss respond to the PCI with respect to the entire hypnosis session, without any additional period of sitting silently. This may explain why our Ss reported less Attention, more Self-Awareness, and more intensive Internal Dialogue (with medium effect size) than the subjects in the study of Pekala and Kumar (1987). Józsa (2012), however, warns that almost 25 years had gone between the two investigations, and cultural differences between USA and Hungary also has to be taken in consideration.

The tools intended to measure a coherent, multi-faceted construction “mentalization”, showed small or no correlations. There were some sparse correlations between ECS and TAS-20, but RMET seemed to be independent from them. In my opinion, it does not mean that reading the mind from the eye is not a part of mentalization; if not caused by measurement error, it may suggest that inferring emotional information from the eyes is not relevant in taking others’ emotions (which may be conveyed by gestures, actions, and even by voice, as we have seen). It may also play lesser role in relaxational hypnosis, where people usually shut their eyes. The lack of interrelation, however, warns that assessment of mentalization is a harder nut than cracking it with three short paper-and-pencil tools based on self-report, or with the recognition of emotions from photographs. Adequate assessment of mentalization skills should include qualitative techniques ([Luyten et al., 2012](#)) and a more complex set of performance tests ([Albu et al., 2012](#)).

The measures of behavioral, emotional, and phenomenological aspects of hypnotic response showed high levels of correlation. This confirms that hypnotic susceptibility is not a uniform construct and besides its biological determination, psychological, social, and (as we have seen in professions, or the experimenter effect), contextual factors also contribute to it. Therefore, integrative bio-psycho-social models ([Bányai, 1991, 2008b](#); [Spiegel & Spiegel, 2004](#); [Jensen et al., 2015](#)) seem to give the most exact description on the nature of hypnosis.

10.2. Testing Hypotheses (and Answering Research Questions)

The titles of the above sub-sections are the research questions I formulated in Chapter 4; numbers of the respective hypotheses are highlighted in **bold** letters.

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

In **Hypothesis 1a**, I expected 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 over controlling behavior, irrespective of the subject’s gender or that of the parent. I hypothesized (**1b**) that those children 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.

These expectations were, to a certain extent, supported by the findings, but the “problematic” aspect of attachment ([Peter et al., 2011](#)) seemed to be in stronger 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. Maternal and Paternal Emotional Warmth accounted for around 5% variance in ECS Positive scores. Gender, age and Parental Punishment explained 23.5% variation in ECS Negative scores. Parental clusters made a negligible difference in RMET scores and none on ECS scores on their own. In gender breakdown, a small difference was seen: Daughters of warm-supportive mothers performed somewhat better on ECS Positive than those who recalled cold-permissive mothers. It seems that parental warmth and caring has a small effect on taking others’ positive emotions.

For alexithymic emotional processing, more robust associations emerged. Separate analyses for the two parents supported that independently from each other (and therefore not being suppressed by the analysis algorithm due to multicollinearity), 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 the combination of 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 showed less Pragmatic Thinking as adults, 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. Difficulty in Describing Feelings (i.e., sharing them with others) did not seem to be related to parental rearing style. The above mentioned results were all significant and had adequate statistical power, but did not exceed medium effects.

In general, these results show that higher recalled emotional warmth of the parents does not lead to better skills in understanding and recognizing (others' or one's own) emotions. On the other hand, to a small-medium extent, Ss who recalled more punishment and cold-controlling behavior from their parents, had a somewhat higher propensity to take and mimic others' negative emotions, and they were at a higher risk of having problems in recognizing their own emotions. If we think about the nature of parental punishment, both of these findings seem to be reasonable. If a child frequently experiences that his/her parents are cold and strict with him/her and that s/he gets punishment, s/he will be more vigilant to the parents' negative emotions, which may help him/her recognize if they are in a "bad mood" that can mean s/he would be beaten or disciplined in other ways if s/he does anything that makes the parents angry. Such a quick detection mechanism may help the child regulate her/his behavior in order to prevent, or at least, to lower the risk of parental rejection or punishment. (This may also have consequences for the emotional bond to the hypnotist, as we will see in the next section.) Maybe this "problematic" mechanism works in the Ss' childhood, and in her/his later relationships ([Peter et al., 2011](#)), while the effect of warmth and acceptance of the caretakers is rooted in the preverbal age, therefore, it is not a subject of memory recall. Another way for the child to cope with the cold-controlling or cold-distant parental behavior is to suppress her/his feelings, without articulating such "dangerous" thoughts like "I am angry with my parents," or letting her/himself to be absorbed in positive experiences. That will make her/him hard to understand and to recognize what emotions s/he is feeling at the very moment. This may be one way of alexithymia mediating the relationship between parental behavior and adult personality disorders ([De Panfilis et al., 2008](#)).

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

Earlier findings (obtained mainly with qualitative techniques) suggested that both warm-loving parental rearing style and cold-controlling behavior may lead to the child's high adult hypnotizability. Therefore I expected (**Hypothesis 2a**) 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 over controlling, will be more hypnotizable than those Ss who evaluate their parents to be closer to average scores in emotional warmth and/or control.

As presented in Chapter 9, EMBU subscales and HGSHS:A scores, following Holm-Bonferroni adjustment, did not show considerable correlations, with the following exceptions: Female Ss' HGSHS:A observer-scores were negatively associated with Paternal warmth, and, to around the same extent, positively with Paternal rejection and punishment. The cluster analysis supported this pattern. Daughters of cold-distant fathers showed much higher hypnotizability (scoring around 9) than children of parents other styles (scoring around 6). A feasible explanation can be found in [J. R. Hilgard \(1970\)](#), [Rhue and Lynn \(1987\)](#); ([Rhue, 2004](#)); namely, these daughters have a higher dissociative capacity because they "escape from reality" (i.e., from their cold and strict or neglecting fathers) this way. It seems like daughters of cold-distant and strict fathers do not express more fear in the hypnotic situation; dissociation, as measured by PCI-5, was also unrelated to parental behavior. We can conclude that the well-documented causal link between parental abuse and the daughters' dissociation ([Gold, Hill, Swingle, & Elfant, 1999](#)) did not play a role in these results. Maybe the daughter of a strict or distant father will want to please her/him (without expressing any fear that otherwise, the hypnotist would be dissatisfied; we cannot forget, however, that in the entire sample, there was an association between paternal rejection and fear of negative appraisal), or she is more obedient to the hypnotist than a daughter of a warm-supportive father or one with average emotional warmth.

Based on theories and clinical observations, I hypothesized (**2b**) that those children 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 will be their emotional bond towards the hypnotist.

In the entire sample, both paternal and maternal punishment were associated with a fear that the hypnotist would negatively evaluate the S in hypnosis. Both parents' overprotective behavior

had the same effect. Paternal Rejection, however, was also associated with the positive aspects of archaic involvement: AIM+ and AIM Need for Dependence scores. Interestingly, the father's punitive behavior had the same ($r = .30$) effect for both AIM+ and AIM- on the males' emotional involvement in hypnosis. In the female subsample, the same levels of correlations, following Holm-Bonferroni correction, were not significant. Multiple regression analyses supported that parents' punishment (in combination with age) explained 6 to 9% in AIM+ and AIM- scores, and 14% of the AIM Fear of Negative Appraisal scores. In cluster analysis, sons of average-controlling fathers felt the most negatively about the hypnotist, while those of average-controlling mothers feared the most from displeasing of the hypnotist. In sum, an "ambivalent" pattern is emerging from these data (although with small effect size). Children, especially sons of punishing and overprotective but not especially warm or loving parents felt somewhat more negatively and at the same time positively about the hypnotist, than children of parents of other types. Daughters' feelings towards the hypnotist were not essentially determined by recalled parental behavior. Like for HGSHS:A scores, I think the keyword here is the boys' *performance*. Apparently, those boys who are treated strictly and not in a very supportive manner, become more anxious about their performance even as adults. It sounds logical that such parents are more perfectionists, wanting their sons to over perform the others, which will increase the boys' anxiety in situations they evaluate as performance tests (Besharat, 2003). The child, on the other hand, may evaluate such a parental attitude as a sign of caring and loving, which may also explain why these boys also feel more positively about the hypnotist in the "hypnotic performance test". Let us note here that one element of the masculine ideology lying under normative male alexithymia is that a boy should always be the best (Levant, 2003), which also influences the relationship between men and their psychotherapists (Fischer and Good, 1997). Being the psychologist of the young man I cited in the Introduction, I can tell you that I was also faced with his ambivalent feelings toward his father, as reflected in his transference feelings. It may also be mentioned that he showed severe alexithymia when he started seeing me.

Previous 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 hypothesized (2c) that such differences will be reflected in their archaic involvement and phenomenological experiences: The former group will have more positive experiences under hypnosis, while the latter will have more negative feelings.

Linear correlations did not support that parental rearing style may influence phenomenological experiences of hypnotic ASC. Nevertheless, both maternal and paternal punishment was 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 various effects on the phenomenology of consciousness under hypnosis. Children of average-controlling mothers felt the most negative affect and arousal, and retained their everyday memory the most from all groups. Those who reported about cold-permissive mothers experienced the least alteration in time sense and altered perception under hypnosis; significantly less than children of warm-supportive mothers. Finally, sons and daughters of cold-controlling mothers were the most absorbed in hypnosis. It seems that those children whose mothers gave frequent orders and behaved with them in a directive (but not too warm) way will feel the most negatively under hypnosis as adults, maybe because they have to keep up a sustained attention to do everything "well". The accepting and tolerant attitude of the therapist may help these kinds of patients feel more relaxed and more connected to their emotions. The non-directive way of communication crafted by Rogers (1961) and the techniques of Ericksonian hypnotherapy (Erickson, Rossi, & Rossi, 1976) can be applied in the treatment of these patients.

10.2.3. Is hypnotic susceptibility, as assessed by the Ss' performance on standardized test suggestions, related to mentalization skills?

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 expected (**Hypothesis**

3a) hypnotic behavior to be associated with facets of mentalization. I hypothesized (**3b**) that the behavioral dimension of hypnotic susceptibility would show a linear association with emotional contagion, and a quadratic relationship with alexithymia.

As outlined in Chapter 8, hypnotic susceptibility was not related to RMET scores. As I mentioned before, HGSHS:A, as opposed to other measures of the behavioral aspect of hypnotic responsiveness, mainly consists of motor suggestions. It does not cover hypnotic phenomena that would require the S to mobilize their mentalizing skills (e.g., age regression, dreaming, person perception, etc.). It can be seen in **Table 47** that HGSHS:A scores had a significant but rather small correlation with ECS scores. These were somewhat smaller than those found by [Cardeña et al. \(2009\)](#). The difference between their study and mine is that while Cardeña and his colleagues administered ECS to the subjects right after the HGSHS:A testing, our Ss filled in the questionnaire 2-3 weeks prior to hypnotizability assessment, which means that these correlations are free from context effect ([Council, 1993](#)). Still, hypnotizability and emotional contagion show a small but robust association. In males, TAS-20 scores were negatively associated with HGSHS: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 correlated positively with AIM-, indicating that higher alexithymia scores were accompanied by more negative emotions towards the hypnotist; and to PCI-5 Negative Affect, showing that alexithymia is also related to feeling more negatively about the hypnotic situation, among females. Multiple regression analysis suggested that both ECS Total and TAS-20 Difficulty in Identifying Feelings contribute to the explanation of HGSHS:A scores, to 5–6%.

Alexithymia, on its own, explained HGSHS:A scores to a somewhat higher extent if, instead of linear regression, their relationship was fitted on a quadratic curve. This indicated that both alexithymics and non-alexithymics show higher hypnotizability than subclinical alexithymics. As we discussed elsewhere ([Költő & Bányai, 2015](#)), this can be explained by many reasons, including that non-alexithymics can mobilize their imaginative involvement under hypnosis, while alexithymics just “do what the hypnotist says”, while subclinical alexithymics may not be able to utilize either of these strategies. This result, however, may be distorted by the uneven balance of Ss across alexithymia groups. In future studies, an alexithymia-stratified sample should be used.

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

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 expected (Hypotheses 4 and 5) mentalizing skills to be associated with feeling more positively about the hypnotist and the hypnosis itself than those who perform worse on mentalization tests.

As to the RMET scores, the hypothesis was not justified, for it entirely lacked an association with the AIM scores. Emotional contagion, on the other hand, seems to be related to them: Both its negative and positive subscales showed small-medium correlations ($r = .23-.28$) with AIM+, AIM Admiration and Bonding, and AIM Need for Dependence. In other words, those who are more prone to catch and mimic others’ emotional expressions will be more involved in hypnosis emotionally, and showing more positive transference to the hypnotist. Alexithymia was also related to both transference feelings towards the hypnotist and phenomenological experience of hypnosis.

AIM- scores were predicted by TAS-20 Difficulty in Identifying Feelings, age, and profession to 11%. In other words, the greater hardship someone experienced in accessing her/his emotions (in combination with her/his age and being or not being a psychologist), the more negative transference feelings s/he had towards the hypnotist. ECS Total explained 4% variance in AIM Admiration and Bonding. Age and difficulty in identifying feelings accounted for 7% variation in AIM Fear of Negative Appraisal. Alexithymia scores were not associated with AIM+ scores, either in a linear or a nonlinear fashion; but sub-alexithymics were the ones who felt the less admiration and bonding toward the hypnotist. Alexithymia and Fear of negative appraisal was in a linear but not in a quadratic relationship: To a small extent, the more alexithymic (and to a higher extent, the

more hindered in access to her/his feelings) someone was, the more s/he feared about displeasing the hypnotist. Alexithymia had no association with the need of depending on the hypnotist.

Those who feel it hard to identify their feelings seem to be more confused about such intricate social situations as hypnosis; and they (at least, men) seem to feel ambivalently about the hypnotist. This alexithymic feature also seemed to predict the fear that the hypnotist will be dissatisfied with the Ss' performance in the hypnotist, or that s/he will be angry with the S.

10.2.5. Is mentalizing ability associated with specific patterns in the phenomenology of ASC under hypnosis?

Apparently, both secure and insecure attachment types can lead to higher involvement in ASCs (and the findings discussed now, to a small-medium extent, supported this notion). Therefore, I hypothesized (5) that Ss with better mentalization skills will have more positive experiences under hypnosis, and they will report more alterations in their consciousness.

The propensity to take negative emotions seemed to be associated with the 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.

TAS-20 Pragmatic Thinking was negatively associated with PCI-5 Positive Affect and Attention to Internal Processes. Difficulty in Identifying Feelings showed a direct correlation with PCI-5 Negative Affect. Externally oriented thinking, logically, is “negatively” related to feeling “positively” about a situation (hypnosis), where you are directed to take attention to your inner processes. Difficulty in Identifying Feelings and age accounted for 8% variance in PCI-5 Dissociative Control; while Pragmatic Thinking explained 4% of the variance in PCI-5 Positive Affect (with a negative regression coefficient). Difficulty in Identifying Feelings, Negative and Positive Emotional Contagion, and being or not being a psychologist together accounted for 17% (!) of the variance in PCI-5 Negative Affect, suggesting that being alexithymic, being a non-psychologist, having a propensity to imitate others' negative emotions while not having a tendency to take the positive ones, lead to more negative feelings under the hypnotic state. PCI-5 Attention to the internal processes, in 12%, was explained by TAS-20 Difficulty in Identifying Feelings, TAS-20 Total score, and age, showing that the less someone could identify her/his emotions, the less s/he was able to concentrate on his/her inward feelings in hypnosis. Quadratic regression was significant only for PCI-5 Positive and Negative Affect. A U-shaped curve for the former indicated that sub-alexithymics felt the less positively about hypnosis, while a bell-shaped curve for the latter suggested that they felt the most negatively under hypnosis. What I said above in Section 10.2.2 on the relationship between cold-(average-)controlling parental style and alexithymia may also influence the Ss' (and especially, the boys') transference to the hypnotist. Given that they may have to perform “well”, they will feel more uncomfortable under hypnosis, and will be more anxious about pleasing the hypnotist than a S who was raised up by warm-supportive fathers. Even after controlling for social desirability, men report higher levels of gender conflict in situations where they have to reveal their emotions, and tend to restrict their emotional experiencing which results in (or caused by) alexithymia (Fischer & Good, 1997). This kind of self-restricted affective processing may be one of the reasons for alexithymic men to be at a much higher risk of alcohol abuse than their non-alexithymic males. It is, however, important to note, that they seem not to use alcohol to reduce their stress. Therefore we can assume they rather use it as a maladaptive coping with otherwise not elaborated emotions, or because of the social norms which prescribe men to suppress emotions *and* to drink (Kauhanen, Julkunen, & Salonen, 1992).

10.2.6. Do mentalization skills mediate the relationship between parental behavior and hypnotic responding?

I hypothesized (6) that while parental rearing style directly influences hypnotic response, this effect will partially or fully be mediated by mentalizing skills. While both positive and negative parental behaviors can lead to stronger hypnotic responses, I expected that parental warmth partly results in increased hypnotic susceptibility through the mediation of good mentalization ability (e.g., alexithymia, which is reflected in negative regression coefficients in the parental rearing →

alexithymia and alexithymia → 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.

As we saw in Section 9.4, 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 behavior 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 subscale, 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 from 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).

How can we explain that alexithymia seems to totally suppress the effect of parental punishment on negative feelings towards the hypnotist? A possible reason is that while we know that the hypnotist in some cases may evoke transference feelings as parents did, Ss may not “link” these situations, i.e., how they feel about their hypnotists has not that much to do with how they felt about their parents. The frequent punishment, on the other hand, may drive these children to be constantly confused about what they are actually feeling, or lacking the words for their feelings. This can lead to experience the hypnotist (and the hypnotic situation, which may “stir up” emotions) as more negative and threatening.

10.2.7. 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?

Based on empirical findings and methodological papers, I expected (7) 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. The EMBU factorial structure, according to the confirmative factor analysis, showed acceptable fit.

Questionnaires EMBU, RMET, ECS, and TAS-20 were administered via the Internet, through the <http://www.kerdoivem.hu> online surveying system. Apart from TAS-20, for which we have evidence for the validity of online testing, to the best of my knowledge, these tests are usually administered in paper-and-pencil form. The great similarity of the current findings to earlier observations, where paper-and-pencil testing was applied, suggests that their online administration is valid (with the above mentioned doubts for RMET).

EMBU showed similar results here as in a paper-and-pencil study I conducted seven years ago. In the present study, Ss reported about significantly less overprotective mothers, but it may seem nothing to do with online administration, rather with the difference in the Ss' age. In TAS-20, much greater differences were observed compared to the Hungarian normative sample. My Ss reported much higher general scores, but much less Pragmatic Thinking than those in the reference sample, who, contrary to those investigated by me, were all students, from the university of another town, and also much younger than those in the present study. On the other hand, the scale showed

excellent factorial validity. The intercorrelation between the factors was comparable to another large-sample, online administered American study ([Bagby et al., 2014](#)).

Since ECS was adapted to Hungarian for the present study (and, adhering to the original instructions, a 4 point scoring system was used), the data cannot be compared to other reference samples. Otherwise, the scale showed favorable psychometric properties and seems to be applicable to online administration.

Scores on the online version of RMET were comparable to the original and to the Hungarian reference values; further studies should be conducted to confirm that unlimited time exposition (the subjects had to move to the next eye photo if they selected the target word for the previous one does not distort the results).

In general, the online administration of these scales seemed to be acceptable. With adherence to the cautionary notes and methodological constraints ([Reips, 2002](#)), Internet-based testing of the psychological constructs hypothesized to be related to hypnotizability, seems to be a useful tool in hypnosis research.

10.2.8. Do the experimenter variables have an effect on the subjects' hypnotic response?

I expected (**Hypothesis 8**) that the experimenter effect would influence the emotional bond to the hypnotist, but would barely influence the behavioral and phenomenological aspects of the hypnotic response, if at all.

The first part of the hypothesis—that the person of the hypnotist has an effect on emotional involvement—seems to be justified by my observations. There was a senior hypnotist and teacher, E.E., who hypnotized many psychology students in the frames of her hypnosis courses. Her Ss showed significantly greater positive transference towards her than did the subjects of C.C., B.B., D.D., and F.F. towards them. C.C. and B.B. also worked in the academic field and taught psychology students, but in the subsamples hypnotized by them, non-psychologists were overrepresented. D.D. and F.F. were two hypnotists coming from the clinical field, having no connection with the university, and also hypnotizing fewer psychologists than E.E. did. E.E. also evoked the most admiration and bonding, and her Ss expressed the most fear that she would not be satisfied with their hypnotic performance. Hypnotists did not evoke statistically different levels of negative transference. Here, I think, two effects are combined, what I label “teacher effect” and “psychologist effect”. Teachers can evoke archaic involvement in a similar fashion and intensity as hypnotists do ([Bányai et al., 2001](#)). Psychologists, as I argued in Section 10.1 above, may be more engaged in hypnosis for many reasons; one of these, not explicated here now, is simply that they may be more eager about it than non-psychologists. Lay Ss who are not keen in the intricate scientific and clinical aspects, may be simply curious about hypnosis, or be skeptical about it; but they may not be as much committed to have profound hypnotic experiences as psychology students may be. An expert of hypnosis, especially if she is a seasoned and charismatic teacher, apparently evokes greater positive transference in her students and colleagues than in lay(wo)men who might know less about her scientific and clinical contributions.

For the above discussed reasons, data may not have met my other expectation that behavioral hypnotizability would be less affected by the person of the hypnotist. In the total sample, in line with the pattern in AIM scores, the Ss of E.E. had the highest HGSHS:A scores, way higher than those of B.B. and C.C. It is worthy of noting that the Ss of A.A., a young clinician, also proved to be more hypnotizable than Ss of the other experimenters. She, however, hypnotized only 20 Ss (3.5% of the total sample) in two HGSHS:A sessions, so this result may be a random product. Certainly, contextual effects like her personality may also have played a role.

Hypnotic responses are influenced by social processes, but these may affect the behavior and the emotional bond with the hypnotist more than the phenomenological experiences. It is supported by the finding that in PCI scores, the experimenter effect was almost negligible. Who hypnotized the Ss had no role in dissociation, negative affect, and visual imagery. A small-sized difference was found in positive affect and attention to internal processes, but *post hoc* analyses did not reveal any individual pattern.

10.3. Gender differences

In the investigation of our aggregated HGSHS:A data (collected since 1975) and SHSS:A and B data (collected since 1973), we detected a discrepant gender pattern across the two datasets. In group hypnosis testing, females were significantly more hypnotizable than males (with medium effect size), but no difference was observed in individual testing. This led us to the conclusion that it is the group situation which “makes” women show more cooperation with the hypnotist. This explanation seems to correspond with social psychological evidence like that, men, are less cooperative and women are more cooperative when observed than when they are not exposed to public attention ([Charness & Rustichini, 2011](#)). Higher cooperation may be reflected in females’ higher HGSHS:A scores, while in individual testing they may not feel “pressed” to act more cooperatively than men, which results in sex-independent SHSS:A and B scores ([Költő, Gösi-Greguss, et al., 2014](#)). The social psychological mechanism between these patterns can be that in public, members of both genders may have a tendency to act in accordance with their perceived sex roles ([Bem & Lenney, 1976](#)). Without this social pressure, the two sexes may demonstrate the same level of hypnotizability, which may indicate that their—genetically determined—ability to experience hypnosis is not different, it is just their expectation about how one should cooperate with the hypnotist is divergent. This explanation fits to the social constructivist approach of gender differences ([Gergen, 1985](#)).

In the present thesis, some observations were made which can also fit the social constructivist view of gender differences. Females were more prone to negative emotional contagion, while showing less overall alexithymia than males. The proportion of women falling into the sub-alexithymic category was almost half of that of men, indicating that they are not (or less) affected by the normative masculine alexithymia. Women also demonstrated higher behavioral hypnotizability and somewhat higher emotional involvement than men. They, on the other hand, as compared to men, did not show greater fear that they would displease the hypnotist (which would indicate that they feel much pressure to behave in a certain way than men); and they also experienced greater alteration in their consciousness than males. Women reported higher level of dissociation, more negative affect and—somewhat contradicting our expectation—stronger attention to their internal processes. The reason the latter result is against our expectation is that hypnotic ASC in females were believed to be associated with external stimuli (e.g., the hypnotist, the hypnotic situation, the physical environment of the laboratory), while that of males were thought to be related to internal stimuli (like their bodily processes) ([Ås, 1962](#)). In laboratory testing, males give better approximations of their bodily mechanisms than females ([Roberts & Penebaker, 1995](#)). Bodily attention, however, predicts female hypnotizability better than that of males ([Költő, Rózsa, & Bányai, 2010](#)), and it seems that the present PCI-5 results also contradict the hypothetic gender difference in the external vs. internal orientation of attention.

An interesting gender pattern was observed in the relationship of alexithymic affective processing and hypnotic responses. Alexithymia was negatively associated with the hypnotizability of males, but not with that of females. It was, on the other hand, related to the negative emotions towards the hypnotist, but just in females. In the phenomenological field, it seemed like the more alexithymic a man is, the less positively he will feel about hypnosis; the less alexithymic a woman is, the more negative feelings she will have.

Maternal and parental rejection and control were associated with the negative feelings towards the hypnotists in the overall sample and (more strongly) in men, but not in women. In men, the recalled cold-controlling and punishing behavior showed medium ($r = .30$ to $.42$) correlation with the fear that the hypnotist would be dissatisfied with them. The daughters of cold-controlling fathers, on the contrary, showed much higher hypnotizability than sons of such fathers. The sons of cold-controlling and cold-distant parents seem to be more anxious about their hypnotic performance (not to make the hypnotist angry), while the daughters of such fathers strived to be good candidates for hypnosis. In general, all the above discussed gender differences were significant and showed adequate power, but did not exceed medium effect size. They seem to be by-products of social constructs like sex roles and expectations ([Marecek, Crawford, & Popp, 2003](#)).

We should not miss, however, the role of some evolutionary processes which may also contribute to gender differences. [Joseph \(2000\)](#) emphasized that labor division, over the course of human evolution, resulted in a somewhat divergent development of male and female brains. The du-

ties like child rearing, gathering, developing and using domestic tools led to functional evolution of the Broca area and the angular gyrus. These are in charge for speech and insertion of temporal sequences and complex concepts into conscious processing. More masculine work as hunting did not require such a refined skill in speech, but demanded excellent visual-spatial processing. These, although not directly related to altered states of consciousness, surely have an effect on how people of different sexes process and experience hypnosis.

10.4. A Subjective Note on Statistics

I have mentioned many times in the chapters where data were presented that psychologists are over-reliant on the levels of statistical significance (**Figure 51**). Just reporting p -values can result in misleading interpretations, as from significant results we cannot make inferences on the statistical sensitivity (power) and the size of the effect. The traditional $p < .05$ is a too weak criterion for saying that there is a statistical effect present, that was the reason for the journal *Basic and Applied Psychology* banning its authors from reporting it, and for some scholars suggesting to search new ways and develop new approaches for statistical analysis ([Ioannidis, 2005](#)).

P-VALUE	INTERPRETATION
0.001	HIGHLY SIGNIFICANT
0.01	
0.02	
0.03	
0.04	SIGNIFICANT
0.049	
0.050	OH CRAP. REDO CALCULATIONS.
0.051	ON THE EDGE OF SIGNIFICANCE
0.06	
0.07	HIGHLY SUGGESTIVE, SIGNIFICANT AT THE $P < 0.10$ LEVEL
0.08	
0.09	
0.099	HEY, LOOK AT THIS INTERESTING SUBGROUP ANALYSIS
≥ 0.1	

Figure 51 | A “usual” way to interpret significance levels.
(Source: <http://xkcd.com/1478/>)

The problem seems to be not exactly with significance level, but rather with the strategy of statistical analysis based on null hypothesis testing, introduced by Fisher in the 20th century, and established by Neyman and Pearson. Their strategy included controlling Type I error (rejecting a true null hypothesis) and Type II error (accepting a false null hypothesis). Both would have been important in evaluating the results of statistical tests, but most researchers rely just on significance levels that control Type I error and they do not calculate statistical power, the probability of *not* making Type II error ([Dienes, 2008](#)). In the present thesis, I attempted to control both kinds of errors. That’s why you saw both the power and the effect size values in nearly (almost) all test results. I admit that this made the thesis even lengthier, nevertheless, I hope these values help in interpreting the data. In some cases, computing power for the given tests would have been beyond the scope of the present thesis. It was the case for mediation, performed upon the instructions of [Baron and Kenny \(1986\)](#). This technique got criticisms recently. One drawback of the method is that its results do not have adequate power ([Preacher & Kelley, 2011](#)). Some researchers, such as [Fritz and MacKinnon \(2007\)](#) and [Hayes \(2009\)](#), offer other methods for mediation analysis which give more reliable results and also provide measures of power and effect sizes.

Another problem with null hypothesis testing and significance is the accumulation of familywise Type I error in multiple comparisons. At first glance, controlling for the aggregated Type I error can easily be solved by multiple testing corrections like the Holm-Bonferroni method

applied in the current thesis. It has, however, its controversies. For instance, there is no agreement in the literature about “how much” consecutive tests make a corpus which has to be corrected immediately ([Rice, 1989](#)). Shall it be tests in one table or all tests in the entire manuscript? The latter version, apparently, would make the process way too strict, and most probably the calculations—which should be done with all p -values up to a hundred decimals—would reject almost all tests. But what amount of data constitutes a “table”? For instance, TAS-20 scores form one total score and three subscales; AIM consists of a positive total, a negative total, and three subscales. To check their associations, twenty correlations should be calculated. What if we want to see if the correlations show a gender pattern? It is twenty more correlations for each gender; if we want to compare the correlations in males and females, it is twenty more Fisher’s r -to- z transformations, which also have their significance values... Shall we count all of these calculations into one table, or into four separate ones? Certainly it has “deep” impact on the Holm-Bonferroni procedure and its results. In my opinion, this dilemma indicates that our striving for adequate correction of familywise Type I error is somewhat accidental, and to put it more frankly, ridiculous. I had dispute with a colleague if I could refer to tests which had turned out to be nonsignificant in the course of Holm-Bonferroni adjustment. She insisted that these were nonsignificant (although, in some cases, they showed adequate power and had medium effect sizes), and therefore, they should not be reported. In the end, I reported only a very few of these results, but I still disagree with her. Maybe it is just the too strict adjustment (e.g., correcting all data in gender breakdown within one adjustment) that led to nonsignificant results.

Most of the above mentioned problems could have been eliminated by using Bayesian statistics, which does not make inferences from comparing the data to hypothetic distributions, but is based on predictions of probabilities if the predictors have fixed values ([Dienes, 2008](#)). Albeit sparsely, the Bayes approach also appeared in hypnosis research recently, and interestingly, even in the topic of mediation ([Woody, 2011](#); [Semmens-Wheeler et al., 2013](#)). Other methods like bootstrapping, or applying SEM techniques that can handle non-normally distributed or binary data, could also enhance statistical quality.

10.5. Limitations of the Study

In Section 10.1, I mentioned that the validity of the RMET may have been compromised by unlimited exposure time, although the distribution of the results and score means suggest that it is not distorted. We also discussed that psychology students are not adequate candidates for such studies, because their mentalizing skills and hypnotic susceptibility is higher than that of other professions (or, at least, the “psychologist” and “teacher” effects should be controlled).

A more worrisome possibility is that the method of hypnotizability testing biased the results. First of all, HGSHS:A is a group method. As pointed out above, group versus individual testing interacts with gender differences. Males tend to be less, while females tend to be more cooperative in a group situation than being tested individually ([Charness & Rustichini, 2011](#)). Although behavioral hypnotizability seems not to be different in group and individual contexts, if the testing method were functionally equivalent, archaic involvement and phenomenological changes in ASC were stronger in individual than in group hypnosis, especially if the hypnotist were allowed to use suggestions tailored to the given subject ([Józsa, 2012](#)). A reasonable explanation for this finding is that in individual, face-to-face hypnoses, the hypnotist pays much more attention to the subject than in a group setting. Even if the text used in the hypnosis is standardized, the hypnotist may accommodate to the actual state of the subject, for instance by changing her/his vocalization ([Gösi-Greguss, 2003, 2002](#)), or pacing the subject according to the observable signs of ASC. This may lead the subjects in individual sessions experience more intensive transference and alterations in consciousness than in group hypnosis where the attention of the hypnotist is distributed among the Ss, and pacing can not follow the single participants’ state, either (or just to a limited extent). They may simply be better in mentalizing each others’ actual states than those who take part in group sessions. Apart from this, in group sessions, mechanisms like social comparison ([Festinger, 1954](#)) may work which may inhibit Ss, or drive them to produce “better” hypnotic performance than they would if they had not been exposed to the attention of other group members. Further studies should

be made to investigate the group processes operating in group sessions of hypnotizability testing, and to check if mentalizing ability shows stronger associations with hypnotic response if the latter is tested individually. Certainly, individual hypnosis testing is much longer and costly than group methods, which shall be taken into account in selecting the ways of analysis to obtain adequate statistical power.

As mentioned in the above chapters, the HGSHS:A is often criticized for its imbalanced content. While it covers the direct motor and motor challenge “domains” of hypnosis, it has much less suggestions tapping into the cognitive and perceptual dimensions of hypnotic response ([Woody & Barnier, 2008](#)). These include, for instance, hypnotic dreams and age regression, which are indeed relevant from the perspective of mentalization. Given that alexithymia influences dreaming ([Lumley & Bazydlo, 2000](#)) and recall of earlier memories ([Karsai, 2009](#)), applying hypnosis methods which contain suggestions for such phenomena would deepen our understanding about how alexithymia and hypnotizability are linked.

Reading the mind in the eyes, emotional contagion, and alexithymia, although they are important elements of mentalization, are just elements, and as my results showed, they do not cover the concept adequately. Apparently, we cannot avoid utilizing qualitative and/or observational methods of assessing the Ss’ mentalization skills. Interview techniques, such as the Reflective Functioning Scale ([Fonagy et al., 1991](#); [Fonagy et al., 1998](#)) or the Toronto Structured Interview for Alexithymia ([Bagby et al., 2005](#)) seem especially fruitful for such investigations.

Although it is not necessarily a limitation, it must be mentioned that my Ss—although some of them reported that they had had strict, demanding and emotionally unresponsive parents—represent the average, healthy population. Maybe in their cases, mentalizing and hypnotic responses show relatively low-effect associations because their abilities are in the “normal”, non-pathological range. I think the other reason for getting low and medium effect sizes is that I took it seriously to control for context effects in this research. I think these results are more valid than they would have been if the Ss had responded to the mentalization tests after hypnosis. Still, these observations also support the notion that mentalization can be understood if we examine cases and populations that are hindered in mentalizing ([Fonagy et al., 2002](#); [Fonagy & Bateman, 2006b](#); [Fonagy, Bateman, & Bateman, 2011](#); [Luyten et al., 2012](#); [Bateman & Fonagy, 2012](#)). Maybe this is the reason why the “problematic” aspect of mentalization (alexithymia) and socialization (parental punishment) were associated with hypnotic responses, and not parental warmth, support, and alexithymia.

Some of the statistical methods, despite my sincere attempts to control the effects of non-normal distributions and the accumulation of familywise Type I Error, may also lead to biased observations. This problem is discussed in the next section.

10.6. Clinical Relevance of the Findings: The Effects of Hypnotherapy

In introducing mentalization in Section 1.1., I mentioned that effective mentalizing is rooted in the mirrored and marked communication of the primary caregiver. For instance, if the child hurts his knee, the mother acknowledges that it hurts (mirroring), but she herself won’t cry (markedness). This kind of interaction is similar to the “container” concept of [Bion \(1962\)](#), which refers to the caretakers’ ability to contain the child’s unbearable feelings without being destroyed by them. The “good” therapist also acts like a container of the client’s negative emotions. In hypnotherapy, the emergence of negative feelings and traumatic life events can be very intensive and rapid ([Peebles, 2008](#)). Therefore, the therapist should be especially prepared to contain emotionally charging mental contents of the patient or the client. The patient taking part in hypnotherapy has the opportunity to reapproach the traumatic event, but the therapist provides a secure and holding environment for him/her. The hypnotherapeutic interventions have many similarities with mentalizing. The therapist empathically acknowledges how hard and painful it can be to relive such an event (“reflective functioning”), but he gives a continuous feedback, assuring the patient that these feelings do not destroy either the patient, or him (“markedness”). This way the therapist proves that he is able to contain the emotions of the patient that first seemed to be unbearable, but in hypnosis, they can be elaborated. The caretaker—unconsciously, but pervasively—treats the infant as an entity that has mental states and is a mental agent. The infant finally learns this, and s/he will utilize this knowledge in the

creation of mental models of causality. Such a reflective adjustment becomes a resource for core sense of the self. Similarly, the hypnotherapist may act as a substitute or model of these early object relationships ([Ferenczi, 1909/2002](#); [Bányai, 1998](#); [Varga, Bányai, Józsa, & Gósi-Greguss, 2008](#)), and with a corrective presence, s/he can facilitate the restoration of the client's self.

For those children whose caretakers provide a mirroring feedback that corresponds with the child's emotions, is contingent, and is adequately marked, the separation between the internal and the external is easier. If the caretaker is easily seized by the child's negative affects (as s/he has problems with affect regulation), s/he will be less able to provide genuine, contingent, and marked reflections to the baby. This hinders the infant in learning how to distinguish between real mental states and representations. The transition from the psychic equivalence to mentalization occurs between the second and the fifth year.

Hypnotherapy, from this perspective, may have an even greater effect than psychoanalytic therapy does, for at least two reasons. First, hypnosis is a regressive state—[Nash \(2008\)](#) built his theory around this concept—, therefore, the hypnotized patient may reach and re-experience “childish” memories more easily than the patient who is engaged in free associations. Second, the altered state of consciousness gives an easy access to affective states and a possibility for the client to detach from the well-known and “routine” representations of the external world, which enables her or him to experiment with new solutions and attitudes. This process is analogous to play, even in the neurophysiological background ([Grastyán, 1985](#); [Bányai, 2006](#)). Even [Freud \(1922/1949\)](#) acknowledged this playful quality of hypnotherapy, although he discounted the verity of the hypnotic representations of reality:

But this [resistance of the hypnotized person to hypnosis] may be due to the fact that in hypnosis as it is usually practised some knowledge may be retained that what is happening is only a game, an untrue reproduction of another situation of far more importance to life (p. 79).

The development of mentalization is not in linear association with the emotional warmth of the caretakers. Problematic attachment predicts specific development for mentalization. For instance, children with a disorganized attachment style will tend to be alertly monitoring the caretaker's behavior, and they grasp all possible social cues to predict the caretaker's possible responses; therefore they become very sensitive to emotional states. In Fonagy and Target's opinion, they might be exact in reading their caretaker's mind, but they are hardly able to understand their own mental states. Problematic attachment, in preventing the child to develop a coherent ability for mentalization, can result in personality disorders, but it is also linked to a large variety of other psychopathological conditions, including psychosomatic illnesses, eating disorders, panic disorder, or depression ([Fonagy et al., 2011](#)).³³

Like in the case of mentalizing skills, the “problematic” aspect of attachment/affective bonding and socialization seem to prevail in hypnotic response, while warm and caring parental behavior seemed to have no effect on these. [Posner and Rothbart \(2011\)](#), however, emphasize the role of a developmental factor in hypnotic brain state which may also have a lot to do with mentalization. This is a mechanism caregivers regularly utilize to soothe the stressed infant. If the small child is anxious or overwhelmed with negative emotions, showing her or him something new and unexpected (and thus reorienting her or his attention) usually induces soothing. This reorientation involves the inferior and superior parietal cortex, the frontal eye fields and some subcortical structures. The introduction of any novel object, on the other hand, also activates the anterior cingulum (ACC). Its role in mentalization and hypnosis was extensively discussed in the introductory chapters of the present thesis. The control systems developing in childhood involve orientation to external stimuli, but in adulthood it is often dominated by the executive network, which is controlled by the person's own goals and intentions. Hypnosis, through the activation of ACC, seems to facilitate turning our attention “outwards”, to the external world.

³³ It certainly does not mean that genetic factors do not play a role in psychopathology. Indeed, current theories of mental conditions emphasize that genetic determination and environmental factors (as neglectful or unpredictable parental behavior) form a circular causal system in the etiology of mental disorders, e.g. in borderline personality disorder ([Skodol et al., 2002](#)).

The mechanism Posner and Rothbart suggests is similar to the “social biofeedback” model of [Gergely and Watson \(1996\)](#). They emphasize that the infants have a natural inclination “to attend and explore the external world and [to build] representations primarily on the basis of exteroceptive stimuli” (p. 1185). According to the authors, the marked communication of the primary caretaker and the process how the child learns affect regulation necessarily include that the caretaker orients the child’s attention to external stimuli (e.g., affect displays of other people), and the child gradually connects these stimuli to her or his internal representations. Let us note that this process is essential in the development in mentalization. Maybe this neurocognitive phenomenon also contributes to the increased preference of hypnotized subjects, mentioned above, to experiment with novel solutions and ways of coping ([Bányai, 2006](#)), which seems to be an essential effect of hypnotherapy. Maybe the shift from the predominance of one’s own goals to external stimuli also helps mentalization and relating to others. Such a shift may also contribute to the relationship between hypnosis and the theory of mind ([Bonshtein, 2012](#)). A novel conceptual model of hypnosis, the Empathic Involvement Theory ([Wickramasekera, 2015](#)) emphasizes the role of social engagement in the propensity to being involved in hypnosis.

Possibly, from among the findings of the present thesis, the most relevant one to clinicians is that alexithymic affective processing is associated with negative feelings towards the hypnotist and the hypnotic state itself. Indeed, parental punishment seems to contribute to negative experiences under hypnosis, not because the hypnotist is like the strict parent, but rather because frequently punished children may have problems in processing their emotions, therefore they find social situations like hypnosis unpredictable and threatening. As described in the literature ([Willemsen, Roseeuw, & Vanderlinden, 2008](#)), many patients with psychodermatologic problems struggle with alexithymia. This was the very case with many of my clients, for instance, those with alopecia areata, trichotillomania, and atopic dermatitis. In all cases, they also reported about overprotective, highly controlling, and/or cold parents. The therapist, in these cases, can act as a corrective “good parent”, especially with giving mirrored and marked feedback about what s/he observes about what actually is happening in the patient. Alexithymic patients may be frightened by their emotions, or may not even show or report any; the therapist, however, can help in structuring and labeling the bodily sensations the Ss actually experience, and teach them how to “label” the symptoms of bodily arousal with emotional words. For instance, the alexithymic young man I recalled in the Introduction, while eating the imaginary sweet apricots in hypnosis, could feel the pleasant smell and taste of the fruit, and he even made some remarks on how soft the apricot’s skin was and how warm it was from the sun. These impressions helped us a lot to understand how he got stuck with his intimate relationships from his childhood, often seeing quarrels between his parents, and often experiencing that his father treated him coldly and strictly. Encouraging him to “live” mindfully in the moments of eating the apricots, and giving hypnotic suggestions to structure this experience, later helped him a lot to accept and give intimacy in the relationship with his girlfriend.

Alexithymia is associated with externalizing problem behaviors. One of its most fatal consequences is the alcoholism of middle-aged men—at least in Hungary. In the light of this apparent relationship, it is strange that we have no Hungarian data on the relationship between alexithymia and alcohol abuse, only Finnish findings ([Kauhanen et al., 1992](#)). We have seen above how alexithymia and drinking can be associated: It does not to reduce perceived stress, rather it handles unbearable (but otherwise not processed) emotions and conformity to male gender role pressure. This was the very case in some of the male patients with psoriasis in my practice, in psychodermatologic consultations I provided in a dermatological clinic. Their excessive drinking was a way to cope with “heavy life”, which certainly exacerbated their skin symptoms. Hypnosis, in such cases, may (a) empower the patients through behavior modification, (b) enhance their perceived agency in abstaining from alcohol, (c) at the same time of the previous two ways, it can help them access and handle their suppressed emotions.

What may be the neural background of this problematic “cold-controlling parents → vigilance to negative emotions / alexithymia” link and its therapy? As mentioned above, alexithymic patients have hardships in interhemispheric information transfer ([Bermond et al., 2006](#)), making it difficult to label the global, un verbalized emotional information. Hypnosis increases interhemispheric communication and changes the locus of automatic information processing, making it easier to verbalize information generated in the left hemisphere ([Bányai et al., 1995](#)). Auto-

matic and fast processing of the negative affects in the amygdala seems to be reduced and “corrected” if anxiety of the subject is eliminated ([Bradley, Mogg, & Millar, 2000](#)), which is one of the core features of hypnotherapy. Finally, alexithymia is characterized by a disruption in early event-related theta synchronization in the brain, which can be detected in many cortical areas, especially in the frontal cortex ([Aftanas, Varlamov, Reva, & Pavlov, 2003](#)). Hypnosis, on the other hand, leads to increased and more synchronized theta activity, in a manner similar to the electrocortical changes in play ([Grastyán, 1985](#)). This can be the reason why the S can “experiment” with unusual responses and solutions to problematic situations in a hypnotic imagery, with the helping presence of the hypnotherapist ([Bányai, 2006](#)). As we saw in Chapter 1, this function of hypnotherapy—the “as if” scene or a transitional space ([Winnicott, 1953](#); [Baker, 2000](#))—is essential in the development of mentalization. Therefore, the hypnotherapist, allowing the client to meet frightening emotions and experiment with different possibilities to handle them, also acts as a corrective agent for damaged mentalizing ability. Finally, the structured situation and the guidance the hypnotist provides may help the alexithymic patient to orient him- or herself in the anxiety-provoking social situations ([Költő & Bányai, 2015](#)). The increased theta activity is related to the familiarity of the conversational partner, and it is related to better perspective taking ([Bögels, Barr, Garrod, & Kessler, 2014](#)), considered to be essential in mentalization. Hypnosis may also enhance mentalizing abilities through this neural mechanism. Hypnosis, like alcohol, partially works through expectations of ASC, and partially through canceling the inhibitory effect of the prefrontal cortex. Still, hypnosis has—so to say—less negative side effects on the liver, but it influences social skills and perceived self-agency in a much more beneficial way.

10.7. Some Directions for Future Research

We have discussed several shortcomings of the present study, that hypnotizability was tested in a group setting, with a method that has predominantly motor aspects of hypnotic susceptibility, and that does not cover the perceptual-cognitive dimension adequately. This problem could have been solved with applying such individual methods like the SHSS:C ([Weitzenhoffer & Hilgard, 1962](#)), or the more recent Elkins Hypnotizability Scale ([Elkins, 2013](#); [Elkins, Johnson, Johnson, & Sliwinski, 2015](#)). Qualitative methods, like the psycholinguistic and content analysis of hypnotic dreams and memories may also help in understanding mentalization. It is a question, for instance, if hypnotic dreams and age-regression memories of alexithymic versus lexithymic Ss differ (*cf.* [Karsai, 2009](#)).

It was difficult—and, as you have seen, partly unsuccessful—to create a battery of short quantitative tests to assess mentalization. A problem can be that most measures of mentalizing ability are pathology-oriented (e.g., RMET was developed to detect autism spectrum disorders, and TAS-20 measures alexithymia), therefore it is not sure that they can appropriately differentiate in the mentalizing skills of healthy subjects. In the future, a more detailed battery, including qualitative measures (and those based on observation and/or psychophysiological indices) is needed for such investigations.

Utilization of such methods would have also made it possible to investigate the hypnotist as profoundly as the participants. The interactional paradigm of hypnosis research ([Bányai, 2008b](#); [Varga et al., 1994](#); [Varga et al., 2006](#); [Varga, Józsa, et al., 2012](#)) could be supplemented by methods of assessing the H’s mentalizing capacity. In the above presented study, the hypnotist him/herself was not scrutinized (just the differences between different Hs). It leads us to the following questions: How much does the H mentalize about the S or her-/himself under hypnosis? Does her/his baseline mentalization skill count anything in the hypnotic situation? Do the efficacy and/or the “emotional valence” of hypnosis depend on the mentalizing skills of the H? These questions would also have profound consequences for the training of hypnotherapists and planning hypnotherapeutic interventions.

Another exciting area where the research could be developed further is applying ways to obtain “hard data” on mentalization and hypnosis. This should include the synchronous investigation of the subject and the hypnotist in the hypnosis situation. For instance, their EEG activity could be recorded simultaneously, similarly to the study of [Bányai et al. \(1985\)](#). “Social electrophysiology”

of hypnosis could also be supplemented by electromyographic measurements that would demonstrate emotional contagion ([Berger & Hadley, 1975](#); [Lundqvist, 1995](#)). Theta activity in the brain, heart rate variability, and activity of facial muscles seem to be especially relevant psychophysiological indicators of the mentalization process. Stratification methods could be used to secure that LH, MH and HH subjects, and/or lexithymics, sub-alexithymics, and alexithymics are represented in the sample in balanced proportions.

These methods and future studies may also help hypnotherapists in becoming better “mentalizers” themselves. The therapist’s ability to access her or his own countertransference emotions seems to be essential in the success of the therapy ([Kernberg, 1975](#)). Hypnotherapy may be a very effective way of helping our patients also become better in mentalizing. As the findings of the present thesis demonstrated, it may especially be helpful for those patients who had experienced frequent parental punishment and thus developed alexithymia. Hypnosis, as Hercule Poirot, the famous Belgian detective put it, may help them *to see with the eyes of the mind*.

11. MAGYAR NYELVŰ ÖSSZEFOGLALÁS

HABÁR ÚGY TŰNIK, a „környezet vagy nevelés” vitának nincs végleges és kielégítő megoldása, a legtöbben egyetértenek benne, hogy a gyermekkori társas élményeknek messzemenő következményei vannak a felnőttkori pszichés működésre nézve (pl. [Plomin & Bergeman, 1991](#)). [Bowlby \(1969\)](#) klasszikus kötődési elméletének megjelenése óta számos bizonyíték született arra, hogy kapcsolatunk az elsődleges gondozó(i)nkkal nagymértékben meghatározza képességünket a szoros személyközi viszonyok kialakítására és fenntartására. A kötődés alapvető formája az anyacsecsemő kapcsolat, de későbbi életszakaszokban való megjelenése, a szülőkhöz fűződő érzelmi kötelék ([Bowlby, 1979/2005](#)) ugyancsak a biztonság, a szeretet és a törődés fő forrása lehet. A szülőknek a gyermekkel szembeni viselkedését két dimenzió, az érzelmi válaszkészség („hideg” vagy „meleg” szülő) és a követelmények szintje („kontrolláló” vagy „megengedő” szülő) mentén lehet csoportba sorolni ([Baumrind, 1967](#); [Maccoby & Martin, 1983](#)).

A szülő gyermekével szemben tanúsított bánásmódja jelentős hatással van a gyermek mentalizációs képességére. A mentalizáció alapvető a szelf szerveződésében, saját és mások érzelmeinek megértésében és a másokkal való kapcsolat kialakításában. A mentalizáció az a képességünk, hogy a személyközi viselkedést mentális állapotoknak tulajdonítsuk. A jól funkcionáló szülő az érzelmetükrözés és a címkézés folyamatainak révén megfelelő visszajelzéseket tud adni a gyermeknek. A mentalizációt e folyamat során sajátítjuk el ([Fonagy et al., 2002](#)). Egyértelműnek tűnik, hogy a szeretetteljes és törődő szülő jó alapot tud biztosítani a gyerekek ahhoz, hogy megfelelő mentalizációs képességet fejlesszen ki. Az érzelmileg elérhetetlen szülő, aki nem tud megfelelő visszajelzést adni a gyerek reakcióira – vagy azokat túlzott szigorral szabályozza –, arra sem képes, hogy biztonságos környezetet teremtsen gyermekének a mentalizációs képességek elsajátítására. A gyerekek szimbolikus műveleti képességeit és mentalizációs készségét előrejelzi, hogy a szüleik hogyan játszanak velük ([Keren et al., 2005](#)).

A mentalizáció több dimenziós jelenség. Magába foglalja a lexitímiát (az érzelmek azonosítására és kifejezésére való képességet), az empátiát, az érzelmi ragály iránti fogékonyságot, az elmeolvasást, az irónia megértésének képességét és más aspektusokat is ([Luyten et al., 2012](#)). Mostanáig elsősorban a mentalizáció kognitív vonatkozásait kutatták, noha az affektív vetülete nem kevésbé fontos ([Fonagy & Target, 2003](#)).

Hasonló tendencia figyelhető meg a hipnóziselméletek fejlődésében. A legutóbbi időkig a legtöbb kutató a hipnotikus állapot kognitív és idegrendszeri vonatkozásait tanulmányozta. Csak kevés olyan elmélet született, amely hangsúlyozta volna a jelenség affektív természetét ([Bányai, 1998](#); [Woody & Szechtman, 2007](#); [Nash, 2008](#)). Logikus feltételezésnek tűnik, hogy azok az emberek lesznek erősen fogékonyak a hipnózis iránt, akik nagyfokú személyközi orientációt mutatnak, optimális elmeolvasási készséggel rendelkeznek ([Bonshtein, 2012](#)), és képesek az empátiára ([Wickramasekera, 2015](#)). Kutatási eredmények igazolják, hogy a hipnotikus fogékonyság összefügg az empátiával ([Wickramasekera & Szlyk, 2003](#)) és az érzelmi ragállyal ([Cardeña et al., 2009](#)). Az érzelmi ragály az a hajlamunk, hogy automatikusan átvegyük és utánozzuk mások érzelmkifejezéseit ([Hatfield et al., 1994](#)). A szociál-pszichobiológiai megközelítés szerint a hipnózis olyan módosult tudatállapot, amely a hipnotizált személy és a hipnotizőr kölcsönhatásából fakad ([Bányai, 2008b](#)). Ebben az elméletben a hipnotikus fogékonyság a hipnózis-helyzetben mutatott viselkedéses, érzelmi, fenomenológiai és neurofiziológiai alkalmazkodás rugalmasságának mértéke. A szociál-pszichobiológiai elmélet logikus továbbfejlesztésének tűnik, hogy hipnózis csak akkor jöhet létre, ha a résztvevők képesek felismerni és feldolgozni egymás mentális állapotait, és azoknak megfelelően cselekedni. Más szavakkal: a hipnózis és a mentalizáció összekapcsolódnak.

Ezt alátámasztja a két jelenség fejlődési meghatározottságának hasonlósága. Ahogy fent említettem, a mentalizálás összefügg a meleg, szeretetteljes (és játékos) szülői viselkedéssel. [J. R. Hilgard \(1970\)](#) kvalitatív kutatásából tudjuk, hogy a felnőttkori magas hipnabilitáshoz több út is vezet. A meleg-szeretetteljes szülők gyermeke hajlamos lehet rá, hogy azonosuljon a szüleinél látott disszociatív viselkedésformákkal, például valami kellemes tevékenységbe való elmerüléssel. Ennek tulajdonítható, hogy felnőttként képes lesz a hipnotikus módosult tudatállapotba bevonódni. A hi-

deg, elutasító vagy büntető szülői viselkedés következtében viszont a gyermek azt tanulhatja meg, hogy „a valóság elől való menekülésként” disszociatív stratégiákat alkalmazzon. Így ő is képes lesz a felnőttkori hipnotikus disszociációra. A két útvonal közötti különbséget a hipnózisbeli élményekben lehet tetten érni: szemben a szeretetteljes légkörben felnevelt gyerekekkel, a hideg-elutasító szülők gyermekei félelmetes és negatív helyzetként élhetik meg a hipnózist. Habár a „különböző útvonalak” elméletre van némi empirikus bizonyíték ([Rhue, 2004](#)), a modell kvantitatív vizsgálata jórészt hiányzik a szakirodalomból. Kutatócsoportunk kezdeti eredményei azt mutatták, hogy a hideg, túlvédő és büntető szülői viselkedés összefügg a hipnabilitással ([Költő, 2008](#); [Heller, 2011](#)). Az azonban továbbra is kérdés, hogy vajon a Baumrind, illetve Maccoby és Martin által leírt szülői stílusok és a hipnotikus válaszkészség között van-e összefüggés.

A viselkedéses hipnotikus fogékonyság és az empátia, valamint az érzelmi ragály kapcsolatára vonatkozó, fent említett adatok ugyancsak alátámasztják, hogy a hipnotikus és a mentalizációs képességek összefüggnek. Ezek a kutatások azonban nem terjedtek ki a hipnózis érzelmi és élménybeli dimenziójára. A viselkedéses válaszok mellett a hipnózis kutatásában tekintetbe kell venni a hipnotizőr iránti archaikus bevonódást és a tudati módosulás jellegzetes élményeit is ([Shor, 1962](#)).

A hipnotikus válasz és a mentalizáció összefüggését alátámasztó bizonyítékok harmadik csoportját neurofiziológiai, neuroendokrin és pszichogenetikai kutatások alkotják. A hipnózis és a mentalizáció is nagyon összetett jelenség. Nincs egy jól körülírható agyi központjuk, hanem összehangolt kérgi és kéregalatti agyi aktivitás eredményeképpen létrejövő neuroszignatúrák, amelyek azonban nagymértékben átfednek egymással. Mindkettőben lényegi szerepet játszik a tükroneuron-rendszer ([Gallese et al., 1996](#)). Egy másik közös mechanizmus a prefrontális (PFC) és az anterior cinguláris kérgi rész (ACC) összekapcsolódó aktivitása. Ez a kapcsolat felelős a mások és a saját viselkedés monitorozásáért és mások viselkedésének bejósolásáért ([Frith & Frith, 2006](#)). E két kérgi rész magas hipnabilitásúaknál (mindennapi éber állapotban mért) erős funkcionális konnektivitása okozza, hogy a fogékony személyek – az alacsony fogékonyságúaknál jobban – képesek a külvilág ingereinek szűrésére és az interperszonális adaptációra ([Hoefl et al., 2012](#)). Úgy tűnik, hogy amikor a szülők (megnyugtatóan) a kisgyerekek figyelmét külső ingerekre irányítják, ez ugyancsak hozzájárul az ACC aktivitásához és így a felnőttkori hipnotikus válaszhoz ([Posner & Rothbart, 2011](#)). A harmadik idegrendszeri hasonlóság a jobb félteke túlsúlya mind hipnotikus állapotban, mind mentalizálás során. A „jó mentalizálók” és a magas hipnabilitásúak, úgy tűnik, jó képességgel rendelkeznek a jobb és bal féltekei információk integrálásában. Ez a képesség ellenben csökkent az alexitímias személyeknél ([Bermond et al., 2006](#)). A hipnoterápia segíthet nekik „újjaépíteni” a féltekék közötti kapcsolatot, és megtalálni az (elnyomott) érzelmi állapotok leírásához szükséges verbális címkéket ([Bányai, 2006](#)).

Mind a hipnotikus kapacitást, mind a mentalizációt részben a katekol-O-metiltranszferáz (COMT) szintjének genetikai változatossága határozza meg. A COMT lebontja a dopamint a központi idegrendszerben, így a fenntartott figyelem működésében és számos érzelmi folyamatban. Bár az eredmények nem egyértelműek, úgy tűnik, a COMT genetikai variációja mind a magas hipnabilitással ([Szekely et al., 2010](#)), mind a jobb elmeolvasási képességgel összefügg ([Lackner et al., 2012](#)). Az oxitocin szintje ugyancsak szerepet játszik mind a hipnabilitásban, mind az elmeolvasási képességben ([Varga & Kekecs, 2014](#); [MacDonald & MacDonald, 2010](#)), s ez az összefüggés lehet a hipnoterápia egyik hatásmechanizmusa ([Zelinka et al., 2013](#)). Ezek az eredmények vezettek ahhoz, hogy megfogalmazzam az alábbi tézist:

A hipnotikus interakció megkonstruálásához mind a hipnotizált személy(ek)nek, mind a hipnotizőrnek képesnek kell lennie arra, hogy észlelje, felismerje és azonosítsa („kiolvassa”) mind saját, mind a másik személy elvárásait, motívumait és érzelmi állapotait. Ez ugyancsak előfeltétele annak, hogy a hipnotizált személy tudati állapotmódosulást éljen át hipnózisban. A hipnózist ezért értelmezhetjük úgy, mint a mentalizáció termékét vagy származékát, amely a résztvevők inter- és intraperszonális mentalizációs készségeinek függvénye. Mivel ezek a képességek a kötődés, az érzelmi kötelek és a szocializáció kontextusában alakulnak ki, a szülők gyermekkel szembeni viselkedése a mentalizációs képességek kifejlődésén keresztül befolyásolhatja a gyermek felnőttkori hipnotikus reakcióját.

Doktori értekezésem célja az volt, hogy megvizsgáljam a szülői nevelési stílus, a mentalizáció és a hipnotikus válasz közötti kapcsolatot. Úgy gondolom, hogy kapcsolatuk megértésének nagy jelentősége lehet a hipnoterápiás intervenciók megtervezésében és kivitelezésében. Ez különösen fontos lehet alexitímiás kliensek kezelésében, akiknek nehézségeik vannak a saját érzelmi állapotuk mentalizálásában ([Költő & Bányai, 2015](#)).

11.1. Kutatási kérdések és hipotézisek

A fent kifejtett érvelést követve, azt a hipotézist fogalmaztam meg, hogy bizonyos mentalizációs készségek (a szemekből való olvasás képessége, az érzelmi ragályra való fogékonyság és a lexitímia) összefügg a hipnotikus válasz viselkedéses, érzelmi és fenomenológiai dimenzióival. Ugyancsak feltételeztem, hogy ezeket a szülők viselkedésére vonatkozó emlékek befolyásolják. A mentalizálásra való képesség mediálhat a szülői viselkedés és a hipnotikus válasz között: Azok, akik meleg és támogató szülőket idéznek fel, talán azért vonódnak be jobban a hipnózisba, mert megfelelő „inputot” kaptak szüleiktől ahhoz, hogy jobb mentalizálónak váljanak.

Disszertációmnak ennek az elméleti hármoszögnek a vizsgálata mellett két módszertani mellékcélja volt. Egyrészt ellenőrizni kívántam, hogy a szülői nevelési stílus emlékeit és a mentalizációs készségeket mérő kérdőívek online teszteléséből származó adatok összevethetőek-e korábbi, papír-ceruza tesztelést alkalmazó kutatások eredményével. Másodszor, a hipnóziskutatás szakirodalmának hézagos területe a potenciális kontextuális változók – pl. a vizsgálati személyek (vsz) neme, életkora, hivatása; vagy a hipnotizőr személyéből fakadó hatás – vizsgálata ([Kihlstrom, 2008](#)), ezért vizsgálatom e változók lehetséges szerepére is kiterjedt.

- | | |
|----------------------|---|
| 1. kérdés | Összefüggenek-e a szülői nevelésre vonatkozó emlékek a mentalizációs készségekkel (beleértve a szemekből olvasás képességét, az érzelmi ragályt és a lexitímiát)? |
| 1a. hipotézis | Azt várom, hogy a mentalizációs készségek bizonyos alcsoportja összefügg egyes szülői viselkedésmódoakkal; név szerint, a mentalizációs készségek pozitívan függenek össze a szülői melegséggel, míg negatívan korrelálnak a szülők elutasító és túlkontrolláló viselkedésével, függetlenül a szülő, illetve a vizsgálati személy (vsz) nemétől. |
| 1b. hipotézis | Azt várom, hogy azok a vizsgálati személyek mutatják a legjobb mentalizációs készségeket, akik meleg-támogató (autoritatív vagy megengedő) szülőket idéznek fel. Akik hideg, nem támogató vagy erősen kontrolláló szülőket idéznek fel, rosszabb teljesítményt fognak nyújtani a mentalizációt mérő teszteken. |
| 2. kérdés | Hogyan függenek össze a szülői viselkedésre vonatkozó emlékek a hipnotikus fogékonyság dimenzióival? |
| 2a. hipotézis | Korábbi, főleg kvalitatív módszerrel gyűjtött adatok arra utalnak, hogy a meleg-szeretetteljes és a hideg-kontrolláló szülői viselkedés a gyermek magas felnőttkori hipnotikus fogékonyságához vezet. Azt várom, hogy ezeket a mintázatokat kvantitatív vizsgálattal is igazolni lehet. Azok, akik szüleikre szeretetteljes vagy elutasító / túlkontrolláló szülőként emlékeznek, hipnábilisabbak lesznek, mint akik átlagos szülői szeretetet és/vagy kontrollt idéznek fel. |
| 2b. hipotézis | Elméleti megállapítások és klinikai megfigyelések alapján azt várom, hogy azok a személyek, akik meleg és szeretetteljes szülőket idéznek fel, inkább pozitív archaikus bevonódást mutatnak a hipnotizőrrel szemben, míg minél inkább hideg-elutasító szülőket idéznek fel, annál kevésbé lesznek a hipnotizőr iránti érzelmeik pozitívak. |
| 2c. hipotézis | Kvalitatív eredmények arra utalnak, hogy mind a meleg-szeretetteljes, mind a hideg-kontrolláló vagy elutasító szülők gyermekei erősen hipnábilis felnőttek lesznek, de különböző érzelmeiket mutatnak a hipnotizőr iránt. Azt feltételezem, hogy ezek a különbségek a hipnotikus állapottal kapcsolatos élményeikben is megjelennek: az első csoportnak több pozitív, míg a második csoportnak több negatív élménye lesz a hipnotizőrt illetően. |

- 3. kérdés** Összefügg-e a standard tesztszuggesztiókkal mért hipnotikus fogékonyság a mentalizációs készségekkel?
- 3a. hipotézis** Mivel a hipnotikus válaszkészséghez szükséges, hogy a hipnotizált személy felismerje és megértse a hipnotizőr elvárásait és szuggesztióit (amelyek bizonyos értelemben a hipnotizőr „mentális állapotát” fejezik ki), azt feltételezem, hogy a hipnotikus viselkedés összefügg a mentalizációs készségekkel.
- 3b. hipotézis** Korábbi szakirodalmi eredmények alapján azt várom, hogy a hipnotikus fogékonyság viselkedéses dimenziója lineáris kapcsolatban van az érzelmi ragállyal, és kvadrátosan függ össze az alexitímias érzelmfeldolgozással.
- 4. kérdés** Összefüggenek-e a hipnotizált személy hipnotizőrrel kapcsolatos áttételi érzelmei és a hipnózishelyzetbe való érzelmi bevonódása a mentalizációs képességeivel?
- 4. hipotézis** Akik jó mentalizációs készséggel rendelkeznek, talán kevésbé érzik stressztelienek és zavarba ejtőnek a személyközi helyzeteket, mint azok, akiknek a mentalizáció nehezített. Ezért azt feltételezem, hogy a mentalizálásra való képesség a hipnotizőrrel és a hipnózis-szituációval kapcsolatos pozitív érzelmekkel jár.
- 5. kérdés** Összefügg-e a mentalizációs képesség bizonyos hipnotikus módosult tudatállapotra jellemző élménymintázatokkal?
- 5. hipotézis** Azt feltételezem, hogy a jobb mentalizációs készségekkel rendelkező személyek a hipnotikus állapotot pozitívabban élik át.
- 6. kérdés** Mediálnak-e a mentalizációs készségek a szülői viselkedés és a hipnotikus válasz között?
- 6. hipotézis** Feltételezem, hogy míg a szülői nevelési stílus közvetlenül befolyásolja a hipnotikus reakciókat, a mentalizálásra való képesség részben vagy teljesen mediálja ezt a kapcsolatot. Bár mint a pozitív, mind a negatív szülői viselkedés erősebb hipnotikus választ eredményezhet, azt várom, hogy a szülők érzelmi melegsége a jobb mentalizációs készségeken keresztül növeli meg a hipnotikus fogékonyságot (pl. a lexitímia révén, ami a szülői nevelési stílus → alexitímia, és az alexitímia → hipnábilitás kapcsolatok negatív regressziós együtthatóiban fejeződik ki). Másfelől a mentalizálás negatív vonatkozásai (pl. az alexitímia) mediálhat a hideg-kontrolláló, elutasító vagy büntető szülői viselkedés és a viselkedéses hipnábilitás magas szintje között.
- 7. kérdés** Összehasonlíthatóak-e a szülői nevelésről és a mentalizációról online módszerrel gyűjtött adatok a laboratóriumban felvett papír-ceruza kérdőívkitöltésből származó eredményekkel?
- 7. hipotézis** Empirikus eredmények és módszertani tanulmányok alapján azt várom, hogy az „Emlékeim a szülői nevelésről” (EMBU), az Érzelmi Ragály Kérdőív (ÉRK), a Torontói Alexitímia Skála (TAS-20) és a Szemékből Olvasás Teszt (SZOT) internetes felvételével gyűjtött adatok olyan pszichometriai tulajdonságokkal rendelkeznek, amelyek hasonlóak azokhoz a korábbi kutatásokhoz, amelyekben e teszteket laboratóriumi környezetben, papír-ceruza módszerrel vették fel.
- 8. kérdés** Van-e a hipnotizőr személyének hatása a vizsgálati személyek hipnotikus fogékonyságára?
- 8. hipotézis** Azt várom, hogy ez a hatás befolyásolja a vizsgálati személyek hipnotizőrrel kapcsolatos áttételi érzelmeit, de csak nagyon kis szerepe van – ha van egyáltalán – a hipnotikus válasz viselkedéses és élménybeli dimenziójára.

11.2. Minta és módszer

Fontos, hogy a megfelelő statisztikai erőhöz szükséges elemszámú legyen a kutatás. Az elemszámot *a priori* elemzéssel határoztam meg, amely azt jelezte, hogy $N \approx 200$ körüli vsz megfelelő érzékenységű statisztikai teszteléshez tesz lehetővé. A vizsgálati elrendezésből fakadóan azonban 565 vsz hipnotikus kapacitását mértük fel. Egy részük a hipnózist megelőzően egy online kérdőívcsomagot is kitöltött, amely magába foglalt egy kérdőívet a szülői viselkedésről, valamint három, mentalizációs képességeket mérő tesztet. A vsz-ek változatos életkori csoportokat képviseltek. Az összes személy közül 459-en adtak információt a foglalkozásukról. Nagy részük pszichológus (ide értve a diplomás szakemberek mellett a pszichológia szakos egyetemi hallgatókat is) vagy egészségügyi dolgozó volt, de más hivatások ugyancsak megtalálhatók a mintában. A pszichológus vizsgálati személyek részvétele mentalizáció- és hipnóziskutatásokban torzító hatású lehet. A pszichológusok ugyanis ki vannak képezve az érzelmeikkel való foglalkozásra, és magasabb hipnotikus fogékonyságúak, mint más szakmák képviselői (Költő et al., 2015). Ezért – hogy a szakmai eloszlás aránytalanságát kiegyenlítsük – az online tesztelésben csak a pszichológusok egy töredéke vett részt.

A személyeket hozzáférhetőségi és hólabda-módszerek kombinációjával toboroztuk. A részvétel feltétele a betöltött 18. életév és testi-lelki egészség volt. A vsz-ekkel e-mailben vettük fel a kapcsolatot, és egyeseket arra kértünk, hogy töltsék ki az online tesztcsomagot. Ez a következő mérőeszközöket tartalmazta. Az *Emlékeim a szülői nevelésről* ('Egna Minnen Beträffande Uppfostran', *EMBU*) kérdőív (Arrindell et al., 1999) 23 tételből áll (Arrindell és munkatársai tanulmányában az eszköz magyar nyelvű változata is szerepel). Ez az apa és az anya *Elutasító* viselkedését, *Érzelmi melegségét* és *Túlvédő magatartását* méri. Operacionális céllal kialakítottam egy negyedik alszkálát, a *Büntetést*, amely az Elutasítás és a Túlvédés alszkálák egyes teteleiből áll. Az eredeti 23 tétel elé három kérdést illesztettem a vsz elsődleges gondozóiról és a családi struktúráról, a tetelek után pedig négy, szintén új kérdéssel mértem a szülők iránti szeretetet. A *Szemekből Olvasás Tesztet* (*SZOT*) (Baron-Cohen et al. (2001) fejlesztette ki, és Ivády et al. (2007) adaptálta magyar nyelvre. Az eszköz 36 fekete-fehér fényképből áll, amelyek komplex érzelmi kifejezésű emberi arcok szemkörnyéki régióját mutatják. Ezeket egymás után mutatjuk be a vsz-nek, akinek az a feladata, hogy a képet kísérő négy érzelmeirő szó közül kiválassza azt, amit az adott fénykép modellje érez. Az *Érzelmi Ragály Kérdőív* (Doherty, 1997) 15 tételből áll, melyek azt mérik, hogy a személy mennyire hajlamos automatikusan átvenni és utánozni mások érzelmi arckifejezéseit. A kérdőív magyar változatát a jelen doktori kutatás keretében alakítottam ki. A tetelek a pozitív és a negatív érzelmek átvételére való hajlamot mérő alszkálákat alkotnak. Végül az online tesztbatteria tartalmazta a *Torontói Alexitímia Skála* 20 teteles változatát (*TAS-20*) (Bagby et al., 1994) (magyar változat: Cserjési et al., 2007). Ez egy önbeszámoló kérdőív, amely *Az érzelmek azonosításának nehézsége*, *Az érzelmek kifejezésének nehézsége* és a *Pragmatikus gondolkodás* (más néven a külső orientációjú gondolkodás) alszkálákból áll.

A vizsgálat első részében a vsz-ek egy online kérdőívkitöltő rendszerben (<http://www.kerdivem.hu>) válaszoltak ezekre a tesztekre. A hipnotikus fogékonyság mérésére 2-3 héttel a kitöltés után került sor. A viselkedéses hipnotikus válasz-készséget a *Harvard Hipnabilitási Csoportskálával* (*HCsS*) mértük (Shor & Orne, 1962), a szabványos instrukcióknak megfelelően. A HCsS magyar standardjének kialakítása a jelen PhD kutatási projekt keretében történt (Költő et al., 2015), az ELTE Hipnóziskutató Laboratóriumának munkacsoportja által korábban készített adaptáció (Greguss, Bányai, Mészáros, Csókay, & Gerber, 1975) és a laboratóriumban azóta összegyűjtött adatok longitudinális elemzése (Költő, Gösi-Greguss, et al., 2014) alapján. A HCsS-t követően a személyek két kérdőívet töltöttek ki. Az *Archaikus Bevonódási Skála* (*ABS*) (Nash & Spinler, 1989; magyar változat: Horváth et al., 1988) eredetileg 19 tételt tartalmaz, amelyek a hipnotizőr iránti pozitív áttételi érzelmeiket mérik, a magyar változatban pedig 3 kiegészítő tétel a negatív érzelmekre kérdez rá. A pozitív tetelek három alszkálába szerveződnek: ezek a *Csodálat és kötődés a hipnotizörhöz*, *A negatív megítéléstől* [a hipnotizör rosszállásától] *való félelem*, és *Függőségigény*. A vsz-ek végül a *Tudatosság Fenomenológiája Kérdőív* (*PCI*) (Pekala, 1991) töltötték ki, amelyet Szabó (1993) adaptált magyar nyelvre. A kérdőív 53 tételből áll, melyek a módosult tudatállapotokra jellemző sokféle élményre kérdeznek rá. Ezek eredetileg 12 fő- és 14 alszkálába rendeződnek, de operacionális céllal egy egyszerűbb ötfaktoros megoldást is kidolgoztak (Kumar et al.,

1996). Ezek a *Disszociatív kontroll*, *Pozitív érzelmek*, *Negatív érzelmek*, *Vizuális képzelet* és *Belső folyamatokra irányuló figyelem*.

A fent említett okok miatt a személyeknek csak egy része ($230 \leq n \leq 362$) töltötte ki az online kérdőívet. Avsz-eknek az a halmaza, amely minden online tesztet kitöltött, 191 főből állt. A személyek nem kaptak pénzt vagy egyéb díjazást. A kutatást a Magyar Pszichológiai Társaság Szakmai Etikai Kódexének előírásait betartva végeztük.

Elsőként az összes mérőeszköz leíró statisztikáit készítettem el. Ezeket, ahol lehetséges volt, összevettem a magyar referenciaértékekkel, illetve más nagy elemszámú kutatások adataival. A reliabilitás ellenőrzésére kiszámítottam az alsókálák Cronbach-alfa értékeit. A nem-, foglalkozásbeli (és a hipnotizőrök közötti) különbségeket parametrikus vagy nem-parametrikus eljárásokkal ellenőriztem. Ezután konfirmatív faktorelemzést végeztem a strukturális validitás igazolására. A változók közötti összefüggéseket Pearson-korrelációval, illetve lineáris és nemlineáris regresszióelemzéssel vizsgáltam. Annak eldöntésére, hogy a szülőket lehet-e nevelési stílusuk szerint csoportosítani, K-középpontú klaszterelemzést végeztem az EMBU alsókálák pontszámain. A vsz-ek mentalizációs képességét és hipnotikus válaszát – szülei nevelési stílusa szerint – egyszeres és többszörös variancia-analízissel és post hoc utóteszteléssel hasonlítottam össze. Végül annak ellenőrzésére, hogy a mentalizáció mediál-e a szülői viselkedés és a hipnotikus válasz között, mediációelemzést végeztem. Az elemzéseket SPSS 19.0 és AMOS 22 statisztikai programokkal végeztem. A statisztikai erőt a G*Power 3.1 verziójával (Faul et al., 2007) számítottam ki. A hatásméretet kiszámítása kézzel, vagy a Becker-féle (http://www.uccs.edu/~lbecker/index.html#means_and_standard_deviations) online kalkulátorral történt. A konfidencia-intervallumokat 95%-os értékre vonatkoztatva adtam meg. Az összehasonlítások nagy száma miatt – az elsőfajú hiba felhalmozódásának megelőzésére – a szignifikancia-szinteket a Holm-Bonferroni eljárással (Holm, 1979) korrigáltam.

11.3. Fő eredmények

A konfirmatív faktorelemzés és a Cronbach-alfa értékek azt jelezték, hogy a mérőeszközök megfelelő strukturális validitással és megbízhatósággal rendelkeznek. Az átlagértékek és a szórások általánosságban hasonlóak voltak a referenciaértékekhez. A **7. hipotézis** tesztelésére – ahol lehetséges volt – az eredményeket korábbi papír-ceruza és online kutatások eredményeivel vettem össze. Az eltérések nem voltak szignifikánsak vagy jelentős hatásméretűek, ami arra utal, hogy az EMBU, az ÉRK, a SZOT és a TAS-20 esetében az online felvétel a hagyományos papír-ceruza módszer jó alternatívája lehet.

11.3.1. Asszociáció-elemzés

A korrelációk ellenőrzése után többszörös lineáris regresszióanalízist végeztem annak ellenőrzésére, hogy a mentalizációs készségek (**3a.**, **b.**, **4.** és **5. hipotézis**) és a háttérváltozók (**8. hipotézis**) befolyásolják-e a hipnotikus válasz viselkedés, affektív és élménykomponensét. Az alexitímias érzelmfeldolgozás és az érzelmi ragályra való hajlam szignifikánsan hatott a hipnotikus fogékonyságra. A hatás azonban – az f^2 hatásméret-mutatók tanúsága szerint – ritkán haladta meg a közepes hatásméretet jelző 0,15-ös értéket (Cohen, 1977). Mindemellett úgy tűnik, hogy azok, akiknek nehéz az érzelmeik felismerése, kevésbé vonódnak be a hipnózisba, negatívabb érzéseik vannak a hipnotizőr iránt, és jobban félnek attól, hogy a hipnotizőr nem lesz elégedett a teljesítményükkel. Azok, akik hajlamosak voltak mások érzelmeinek automatikus utánzására, hipnázisban voltak, és pozitívabban viszonyultak a hipnotizőrhöz. Az alexitímia összefüggött a hipnózisbeli negatív élményekkel és a belső folyamatokra irányuló figyelemmel; érdekes módon a magasabb alexitímia-pontszámot mutatók negatívabbnak élték meg a hipnózist, de nagyobb figyelmet fordítottak a belső történésekre. Az életkor és a foglalkozás (az, hogy valaki pszichológus-e vagy sem) ugyancsak hozzájárult ezekhez a hatásokhoz.

A szülői viselkedés (**1a.**, **2a.**, **b. hipotézis**) és a háttérváltozók (**8. hipotézis**) mentalizációs képességekre való hatását szintén többszörös lineáris regresszióval vizsgáltam. Az operacionális büntetés alsókála kialakítása az eredmények fényében jogos volt, mert – a túlvédés vagy az elutasítás helyett – sok esetben ez a konstrukció volt a kimeneti változók egyik bejósolója. Az eredmények azt mutatják, hogy a női nemhez tartozás, az apa gyakori büntető viselkedésére vonatkozó emlékek

és az idősebb életkor szignifikánsan növeli a negatív érzelmek átvételére való fogékonyságot. A hatás közepes méretű. Az apai túlvédés, az anyai büntetés, a fiatalabb életkor és az, ha a vsz nem volt pszichológus, előrejelezte az alexitímiás érzelmfeldolgozást, és ezen belül az érzelmek azonosításának nehézségét. Érdekes módon a szülők büntető viselkedése mind a negatív, mind a pozitív archaikus bevonódással összefüggött, ami a hipnotizőrrel mint tekintélyszeméllyel való ambivalens kapcsolatra utalhat. Mindkét szülő büntető magatartása előrejelezte a vsz félelmét, hogy a hipnotizőr elégedetlen lesz a hipnózisban nyújtott teljesítményével. A negatív élményeket és a befelé irányuló figyelmet kis hatásmérettel bejósolta az életkor, a hivatás és az anyai büntetés/túlvédés.

11.3.2. A szülői viselkedés klaszterei

Portugál általános iskolás gyerekek nagy mintáján elvégzett vizsgálat ([Pereira et al., 2009](#)) igazolta, hogy a szülők, az EMBU-pontszámokon elvégzett klaszteranalízis szerint, besorolhatók a Baumrind, Maccoby és Martin által felállított elméleti kategóriákba. A jelen mintán elvégzett K-középpontú klaszterelemzés mindkét szülőre nézve 4 kategóriát tárt fel. Ezek hasonlóak a portugál eredményekhez és megfelelnek az elméleti modellnek, bár a „hideg-kontrolláló” és a „hideg-megengedő” csoport helyett az adott kategóriák EMBU skálaátlagai inkább „átlagos-kontrolláló” szülőket és „hideg-távoli” (de nem túlságosan kontrolláló) apákat jeleznek.

Az **1b. hipotézisben** feltételeztem, hogy a meleg-támogató szülők gyermekei fogják a legjobb mentalizációs képességeket mutatni. Azt vártam (**2c**), hogy mind a meleg-támogató, mind a hideg-elutasító szülői stílusok magasabb viselkedéses hipnotikus fogékonysággal, de eltérő érzelmekkel és élményekkel járnak. A SZOT és az ÉRK pontszámokban nem volt szignifikáns vagy az alacsony hatásméretet meghaladó különbség a szülői klaszterek között. Az apák stílusa közötti különbség csekély mértékben hatott a gyermekeik mentalizációs képességére és hipnotikus válasza-ira. A hideg-távoli apát felidéző vsz-ekre a pragmatikus gondolkodás alacsonyabb szintje, de magasabb (külső megfigyelő által mért) hipnabilitás volt jellemző, mint a többi stílusú apa gyermekeire. Az átlagos-kontrolláló apát felidéző férfiak negatívabban éreztek a hipnotizőr iránt, és jobban féltek a hipnotizőr rosszallásától, mint a hasonló stílusú apára visszaemlékező nők. Az átlagos-kontrolláló anyák gyermekei – nemüktől függetlenül – voltak azok, akik a TAS-20 érzelmek azonosítása alkálán a legmagasabb pontszámot érték el, és nekik volt a legtöbb negatív hipnózisbeli élményük. Általánosságban mutatkozott bizonyos különbség a szülői klaszterek között. A szigorú és átlagos vagy hideg érzelmeket mutató szülők emléke nehezített mentalizációs készségekkel, és a hipnózisba való magasabb bevonódással járt együtt. A hatásméretetek azonban arra utalnak, hogy ezek az összefüggések nem túl nagy erejűek.

11.3.3. Mediáció-elemzés

Bár azt vártam, hogy a szülői stílusok klaszterei nagyobb bejósoló erejűek lesznek, mint a szülői viselkedés egyes elemei, az eredmények szerint ez utóbbiak voltak a jobb előrejelzők. A regressziós egyenletek azt mutatták, hogy bizonyos mértékig mindhárom konstruktum összefüggött egymással. A standardizált béta-együtthatók $|0,20|$ körüli vagy annál magasabb értékei a nemmel, az életkorral és a foglalkozással összjátékban azt sugallták, hogy a büntető-túlvédő szülői viselkedés, az érzelmek azonosításának nehézsége és általában az alexitímiás érzelmfeldolgozás, az archaikus bevonódás negatív vonatkozásai és a hipnózisbeli negatív élmények (és a befelé irányuló figyelem) között kapcsolat van. Annak ellenőrzésére, hogy a mentalizációs képességek mediálnak-e a szülői viselkedés és a hipnotikus válasz között – ahogy a 6. hipotézisben vártam –, a fent említett oksági kapcsolatok bevonásával, [Baron and Kenny \(1986\)](#) módszerével mediációs elemzést végeztem.

Hat robusztus mediációs hatást találtam. Mind az apa, mind az anya büntető viselkedése befolyásolta a hipnotizőr iránti negatív érzelmeket, a hipnotizőr elégedetlenségétől való félelmet és a hipnotikus tudatállapottal kapcsolatos negatív élményeket. E hatások mindegyikét mediálta a vsz. affektív kapacitása, azaz az érzelmek azonosítására való képessége. Az érzelmekhez való hozzáférés és az érzelmfelismerés nehézsége teljesen mediálta a büntetés → negatív archaikus bevonódás kapcsolatot, mind az apák, mind az anyák esetében. Azok a vsz-ek, akiket gyakran büntettek gyerekkorukban, valamivel több negatív áttételt éreztek a hipnotizőr iránt. Am ha az alexitímiás

érzelemfeldolgozást figyelembe vettük, kiderült: a hatást az közvetítette, hogy a gyakori büntetést felidéző személyek általában jobban össze voltak zavarodva, mit érznek éppen.

A gyakori büntetésről beszámoló vsz-ek jobban féltek, hogy a hipnotizőr kedvezőtlenül ítéli meg teljesítményüket. A TAS-20 érzelmek azonosításának nehézsége pontszámokat bevonva az elemzésbe kiderült, hogy az alexitímiás ézelemfeldolgozás részben ezt a kapcsolatot is mediálja.

A szülői büntetés a hipnózisbeli negatív élményekkel is összefüggött. A kapcsolatot az alexitímiás ézelemfeldolgozás teljesen mediálta az apákra vonatkozóan, és részben az anyák esetében.

11.4. Megbeszélés

Hipotéziseimet az eredmények részben igazolták, habár az összefüggések ritkán haladták meg a közepes hatásméretet. Az **1a. hipotézisben** azt feltételeztem, hogy a mentalizációs képességek bizonyos csoportja összefügg egyes szülői viselkedésformákkal. Nevezetesen, a mentalizáció és a szülői melegség között pozitív, a mentalizáció és a elutasító-kontrolláló szülői viselkedés között pedig negatív korrelációt vártam, függetlenül a vsz és a szülő nemétől. Az **1b. hipotézisben** azt vártam, hogy azok a gyermekek lesznek a legjobban mentalizáló felnőttek, akik meleg-támogató (autoritativ vagy megengedő stílusú) szülőket idéznek fel. Azok az vsz-ek viszont, akik hideg, nem támogató vagy erősen kontrolláló szülőkről számolnak be, rosszabb teljesítményt mutatnak a mentalizációt mérő teszteken.

Az eredmények bizonyos mértékben alátámasztották ezeket a feltevéseket, de úgy tűnik, inkább a kapcsolat „problematikus” vetülete ([Peter et al., 2011](#)) függ össze a mentalizációval. Sem a SZOT-, sem az ÉRK-pontszámok nem voltak kapcsolatban a szülői neveléssel (bár egyes szülői viselkedésformák kis mértékben bejósolták az érzelmi ragályt). Az alexitímiás ézelemfeldolgozás és a szülői viselkedés között azonban robusztusabb kapcsolat mutatkozott. Az elemzések igazolták, hogy mindkét szülő túlvédő és büntető viselkedése – egymástól függetlenül is – összefüggött a TAS-20 Érzelmek azonosításának nehézsége pontszámokkal. Ezek a szülői viselkedésformák, a vsz életkorával összejátékban, az alexitímia változatosságának mintegy 10%-át magyarázták. Az alexitímia-összpontszámok varianciáját pedig 10–14%-ban megmagyarázta a szülők büntető és/vagy túlvédő viselkedése, valamint a vsz életkora és szakmája (hogy az illető pszichológus volt-e vagy sem). A szülői stílusok klaszterei között ugyancsak volt különbség. A hideg-távoli apák gyermekei (különösen fiai) felnőttként kevesebb pragmatikus, külső ingerekhez kötődő gondolkodást mutattak. Az átlagos-kontrolláló anyát felidéző személyeknek pedig nagyobb nehézséget jelentett érzelmeik felismerése, mint azoknak, akik más stílusú anyáról számoltak be. Úgy tűnik, a hideg-kontrolláló és a hideg-elutasító szülők gyermekei (különösen fiai) azt „tanulják meg”, hogy elnyomják érzelmeiket. Ez hozzájárulhat ahhoz, hogy felnőttként a társas helyzetekben zavarodottságot élnek át, és az ilyen helyzeteket fenyegetőnek észlelik ([Mallinckrodt & Wei, 2005](#)).

Feltételeztem (**2a. hipotézis**), hogy mind a meleg-szeretetteljes, mind a hideg-kontrolláló szülői stílusban felnevelt gyerekek magas hipnabilitású felnőtté válnak. Az EMBU alszkálái és a HCsS-pontszámok között a Holm-Bonferroni korrekciót követően nem volt szignifikáns kapcsolat, kivéve a következőket. A női vsz-ek HCsS-pontszáma negatívan korrelált az Apai melegséggel, és körülbelül hasonló erősséggel, de pozitívan az Apai elutasítással és büntetéssel. A klaszteranalízis ugyancsak alátámasztotta ezt az összefüggést. Ez az eredmény részben megegyezik a [J. R. Hilgard \(1970\)](#) által feltárt mintázattal, és alátámasztja [Peter et al. \(2011\)](#) megállapítását, hogy a hipnabilitás a kötődés „problematikus” aspektusával függ össze.

Elméleti megállapítások és klinikai megfigyelések alapján feltételeztem (**2b**), hogy a meleg és törődő szülőket felidéző vsz-ek inkább, míg a hideg-elutasító szülőkre emlékező személyek kevésbé fognak pozitív áttételi érzelmeket mutatni a hipnotizőr iránt. Az összmintában mind az apai, mind az anyai büntetés összefüggött a vsz félelmével, hogy a hipnotizőr elégedetlen lesz vele. A szülők túlvédő viselkedése hasonló hatással járt.

Azt vártam (**2c. hipotézis**), hogy ezek a különbségek az archaikus bevonódás mellett a hipnotikus élményekben is megjelennek, és az első csoport számára pozitívabb, míg a másodiknak inkább negatívabb élmény lesz a hipnotikus állapot. Mind az apai, mind az anyai büntetés össze-függött ($r = 0,20$) a negatív élményekkel. Az anyai büntetés, a vsz foglalkozása és életkora 9,5%-ban bejósolta a PCI-5 negatív dimenzióján elért pontszámot. A belső folyamatokra irányuló figye-

lem 6%-át magyarázta a vsz életkora és az anyai túlvédés. A különböző stílusú apák gyerekeinek hipnotikus élményei között nem volt különbség. Az anyai stílusoknak azonban volt némi hatása: az átlagos-kontrolláló anyák gyerekeinek volt a legtöbb negatív élménye.

A 3., 4. és 5. hipotézis arra vonatkozott, hogy a mentalizálási képességek és a hipnotikus válasz három – viselkedéses, érzelmi és fenomenológiai – dimenziója között milyen összefüggés várható. A szemekből való érzelmefelismerés képessége nem függött össze a hipnotikus válasszal. Az érzelmi ragályra való hajlam és a viselkedéses hipnabilitás között valamivel alacsonyabb korrelációkat mértem, mint amilyeneket ([Cardeña et al., 2009](#)) találtak, talán azért, mert a jelen kutatásban az összefüggéseket kontrolláltam a lehetséges kontextushatásra. Az affektív kifejezések utánzására hajlamosabb személyek érzelmileg is jobban bevonódtak a hipnózisba: pozitívabb áttételt éltek át a hipnotizőr iránt. A negatív érzelmek átvételére való fogékonyság összefüggött a hipnózisbeli disszociáció, negatív élmények és befelé irányuló figyelem mértékével. Az alexitímiás érzelmfeldolgozás, különösen az érzelmek azonosításának nehézsége alacsony-közepes mértékben korrelált a hipnotikus válasszal. Férfiaknál a TAS-20 pontszám negatívan függött össze a HCsS-pontszámmal: magasabb alexitímia, bizonyos mértékben, alacsonyabb hipnabilitással járt. Ez kapcsolatban lehet azzal, hogy (hasonló mértékig) a férfiak alexitímia-pontszámai negatívan korreláltak hipnózisbeli pozitív élményeikkel. A nők alexitímia-pontszámának emelkedése a hipnotizőr iránti több negatív érzellel, és a hipnotikus állapotra jellemző több negatív tapasztalattal járt.

A 6. hipotézisben azt fogalmaztam meg, hogy a mentalizációs képességek mediálhatnak a szülői nevelés és a hipnotikus válasz között. A feltételezett mediáló hatások közül a szülői büntetés, az érzelmek azonosításának nehézsége és a hipnózis negatív vetületeinek összefüggése emelkedett ki. Mindkét szülő büntető viselkedése kis-közepes mértékben bejósolta a hipnotizőr iránti negatív archaikus bevonódást, a hipnotizőr rosszsallásától való félelmet és a hipnotikus tudatállapotra jellemző negatív élményeket. Amikor ezeket az összefüggéseket a TAS-20 érzelmek azonosításának nehézsége pontszámok kontrollálása mellett vizsgáltam, a kapcsolat szignifikánsan gyengült vagy teljesen megszűnt, ami azt mutatja, hogy az alexitímia részlegesen vagy teljesen mediálja a büntetés és a negatív hipnotikus válasz közötti oksági kapcsolatot.

Más szavakkal, a gyakrabban büntetett gyerekek felnőttként negatívabb áttételi érzelmeket mutatnak, jobban félnek attól, hogy a hipnotizőr megharagszik rájuk, és általában a hipnózis kellemtlenebb élmény számukra. Ezt a hatást azonban részben vagy teljes mértékben az közvetíti, hogy a gyakrabban büntetett gyermek felnőttként nehezebben tudja azonosítani, hogy éppen milyen érzelmet él át. Erre az összefüggésre logikus magyarázat lehet az, hogy a gyakori szülői büntetést felidéző személy 1) jobban fél a hipnotizőrtől, 2) fél azoktól a helyzetektől, amelyekben valamilyen *teljesítményt* kell nyújtania (és jegyezzük meg: a HCsS *valóban* teljesítményteszt!). Ez a hatás azonban tulajdonítható annak, hogy 3) a gyakran megbüntetett gyerek megtanulhatta, hogy a hideg és szigorú szülővel szembeni negatív érzelmek elfogadhatatlanok, amelyeket el kell nyomni, ami 4) még stressztelibbé teheti számukra a hipnózis-helyzetet, a hipnotizőrt pedig még inkább „fenyegetőként” észlelhetik. Talán hasonló mechanizmus miatt hat az alexitímia a szülői túlvédés és a felnőttkori személyiségzavar közötti kapcsolat ([De Panfilis et al., 2008](#)), vagy az elkerülő viselkedés és a problémás alkoholhasználat közötti összefüggés ([Coriale et al., 2012](#)) moderátoraként.

Vizsgálatom **7. hipotézise** az volt, hogy az EMBU, a SZOT, az ÉRK és a TAS-20 online felvétele a hagyományos papír-ceruza tesztelés érvényes és megbízható alternatívája lehet. Az adatok összhangban voltak más nagy elemszámú papír-ceruza és online módszerrel végzett vizsgálatok eredményeivel. Ez alátámasztja, hogy bizonyos esetekben az online tesztelés kiválthatja a hagyományos kérdőívezést ([Reips, 2002](#)).

Végül feltételeztem (**8. hipotézis**), hogy a hipnotizőr személyfőhatása befolyásolja a vsz-ek hipnotikus válaszait. A hipnotizőrök egyike valóban magasabb viselkedéses és érzelmi fogékonyságot váltott ki, mint kollégái. Az illető azonban egy idősebb egyetemi oktató volt, aki számos pszichológushallgatót hipnotizált. Feltételezhető, hogy ez a két hatás egymást erősítve „érzelmi torzítást” okozott, hiszen a tanár-diák kapcsolatban is megjelenik az archaikus bevonódás ([Bányai et al., 2001](#)). A vsz-ek hivatása, neme és életkora is szerepet játszott az összefüggésekben. Ez azonban véleményem szerint nem jelenti, hogy a pszichológushallgatókat ki kellene zárni a további kutatásokból; csak kontrollálni kell az elemzést a vsz-ek foglalkozására.

A fent ismertetett eredményeknek szerepe lehet a hipnoterápiában. Arra következtethetünk, hogy az alexitímiás személyek – különösen a férfiak – a terápiás helyzetben fenyegetettséget élhet-

nek át. Úgy tűnik, a gyakran büntetett személyek negatívnak érzik a hipnózist, és félnek attól, hogy a hipnotizőr elégedetlen lesz a teljesítményükkel, de nem azért, mert a hipnotizőr a félelmetes szülőt testesíti meg, hanem azért, mert zavarodottságot élnek át a társas helyzetekben. Ezért fontos, hogy hipnoterápiás intervenció alkalmazása előtt vizsgáljuk a kliens alexitímiáját és szülőkkel kapcsolatos emlékeit. A terapeuta megerősítő, támogató viselkedése és annak hangsúlyozása, hogy a klientsől nem várunk „teljesítményt”, elősegítheti a kliens megnyugvását és bizalmát. Ez pedig megalapozza a hipnoterápia jótékony hatását a mentalizációs problémák kezelésében.

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APPENDICES

APPENDIX A. DETERMINING THE IDEAL SAMPLE SIZE

One of the very important issues of the present thesis was to secure an adequate level of statistical power. Researchers using the classical Fisherian statistical methods are too prone to rely on significance and to neglect the importance of power (Dienes, 2008). Statistical significance is the probability of the null hypothesis (there is no effect) being true, but when the null hypothesis is rejected, it may lead to a false positive result. Furthermore, the probability of significance, does not inform us about how sensitive the respective test is, i.e., how probable is that it correctly rejects the null hypothesis when it is false. This feature of tests is the statistical power. We can previously determine the sample size of our studies according to the statistical methods we aim to use and the level of desired power. (Usually power $> .80$ is considered to be adequate.) To determine the adequate sample size for ideal statistical power, I used the study of Cardena et al. (2009) as reference. They found that a correlation of $r = .33$ ($p < .05$) existed between ECS total scores and HGSHS:A self-scores. For ECS Positive items, the correlation was $r = .19$ ($p < .05$), and for ECS Negative items, $r = .31$ ($p < .05$), in a sample consisting of 238 Ss. I calculated the power associated with given levels of correlation (with $p < .05$) in a sample of 100, 200, 300 or 400 subjects. Statistical power of the given correlation for given number of Ss is depicted in Figure 52. To detect a correlation of .20, with relatively high (.90) statistical power, a sample of around 200 subjects is needed. To obtain a correlation of .35, with the same power, around 100 subjects have to be included. In other words, increasing the sample size will increase the power of the statistical tests, and for detecting these levels of correlation in the sample with adequate power, at least 200 Ss must be included in the analysis.

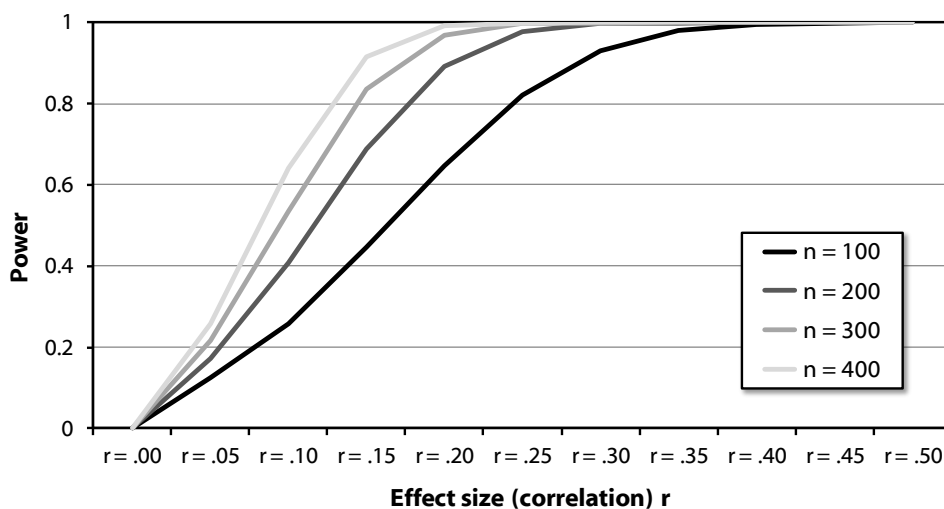


Figure 52 | Power associated with given levels of effect size (correlation) in a sample of 100, 200, 300 or 400 subjects, with $p < .05$ fixed. **The figure shows that for a correlation of .15, with adequate (over .80) statistical power, a sample of around 300 subjects is needed. To obtain a correlation of .35, with the same power, around 100 subjects have to be included.**

The other technique that requires an a priori calculation of the ideal sample size is structural equation modeling (SEM), used for confirmatory analysis in the present research project. The optimal sample size in SEM depends on the complexity of the model, expressed by the degrees of freedom (df), the number of the covariations that are included in the test; but as a rule of thumb, a sample including at least 200 subjects is suggested (Urbán, 2010). There is a table published in MacCallum, Browne, and Sugawara (1996), which lists the minimum sample sizes to achieve a power of .80 besides given degrees of freedom. The smaller the df is, the largest minimum sample

size is needed to obtain the .80 level of statistical power. As you saw in the analyses of structural validity in Section 6.1, the SEM with lowest degrees of freedom ($df = 84$) was the confirmatory factor analysis of the Emotional Contagion Scale's five factor model. To a structural model that includes 84 covariances, in order to achieve a power of .80 and moderate (but still acceptable) closeness of model fit, a minimum of 195 subjects is required. It is important to notice, however, that larger sample sizes are better for SEM, because in small samples, indices of model fit tend to be biased ([Byrne, 2010](#)).

APPENDIX B. CONSENT FORM

HÉRA-9

Hipnózis és Érzelmek Kutatása



RÉSZVÉTELI NYILATKOZAT

(Kérjük NYOMTATOTT NAGYBETŰKKEL kitölteni!)

Alulírott

Név: _____

Születési idő (ÉÉÉÉ-HH-NN): _____

Foglalkozás: _____

(Egyetemi hallgatók esetében: szak, évfolyam): _____

Állandó lakhely (település): _____

Mobiltelefonszám: _____

E-mail cím: _____

kijelentem, hogy az Eötvös Loránd Tudományegyetem Pedagógiai és Pszichológiai Kar Affektív Pszichológia Tanszék (ELTE PPK APT) által szervezett *Hipnózis és Érzelmek Kutatása* című vizsgálatban saját akaratomból, tájékoztatás után, mindenféle befolyásolás és díjazás nélkül veszek részt. Kijelentem, hogy nem szenvedek semmilyen pszichiátriai betegségben, a csoporthipnózis idején alkohol, drogok hatása alatt nem állok. Tudomásul veszem, hogy a kutatás tudományos célokat szolgál, ezzel kapcsolatban további pszichoterápiára igényt nem tartok.

Hozzájárulok, hogy az ELTE PPK APT – a Magyar Pszichológiai Társaság Etikai Kódexe és az Adatvédelmi törvény vonatkozó előírásainak megfelelően – személyes adataimat tárolja és statisztikai adatelemzés céljára felhasználja.

Kelt: Budapest, _____

Vizsgálati személy aláírása

Alulírott Költő András, a kutatás vezetője és Dr. Bányai Éva, a kutatás szakmai felügyelője kijelentjük, hogy az ELTE PPK APIK a vizsgálati személyek által megadott, róluk a kutatásban gyűjtött adatokat a Magyar Pszichológiai Társaság Etikai Kódexe és az Adatvédelmi törvény vonatkozó előírásainak megfelelően tárolja. A kutatás során felvett adatokat csak a kutatás vezetői és az ELTE PPK APIK hipnóziskutató munkacsoportjának tagjai ismerik meg, az adatokat harmadik félnek nem adjuk át. A vizsgálati személy a kutatásban való részvételét bármikor indoklás nélkül visszavonhatja, abból semmilyen kára nem származik. Ebben az esetben korábban felvett adatait megsemmisítjük.

Kelt: Budapest, _____

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HÉRA-9

Hipnózis, Érzelmek és Álmok kutatása

NYILATKOZAT TOVÁBBI KUTATÁSOKBAN VALÓ RÉSZVÉTELRŐL

Alulírott

Név: _____

az Eötvös Loránd Tudományegyetem Pedagógiai és Pszichológiai Kar Affektív Pszichológiai Intézeti Központ (ELTE PPK APIK) által szervezett kutatásokban

- a továbbiakban nem kívánok részt venni.
- a továbbiakban is részt kívánok venni. A kutatócsoportot felhatalmazom, hogy ha további részvételemre van szükség, a megadott elérhetőségeimen felvegyék velem a kapcsolatot.

Fenti nyilatkozatomat bármikor megváltoztathatom, ha ezt az ELTE PPK APIK-nak írásban jelzem. A kutatócsoport ebben az esetben nem tárolja tovább elérhetőségeimet.

Kelt: Budapest, _____

Vizsgálati személy aláírása

APPENDIX C. EMBU

Név:

Dátum:

Szülőkkel kapcsolatos gyermekkori emlékek (EMBU)

Az alábbiakban az Ön gyermekkorával kapcsolatos kérdések következnek. Mielőtt kitöltené a kérdőívet, kérjük, olvassa el az alábbi útmutatót.

1. A kérdőív kitöltésekor igyekezzen visszaemlékezni szülei viselkedésére, pontosabban arra, ahogy ön azt érezte. Annak ellenére, hogy ilyen régi élmények felidézése nehéz lehet, mégis vannak olyan emlékeink, amelyek alapján meg tudjuk ítélni szüleink nevelési szokásait.
2. A kérdések az Ön „apjára” és „anyjára” vonatkoznak. Ha Önt nem vér szerinti szülei nevelték fel, akkor kérjük, hogy az „apával” kapcsolatos kérdéseket férfi, az „anyával” kapcsolatos kérdéseket pedig női nevelője vonatkozásában válaszolja meg. Például:

A szüleim kedvesek voltak hozzám.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

Ha csak egy személy nevelte Önt fel, akkor az adott személy nemének megfelelően csak az „apára” vagy az „anyára” vonatkozó kérdéseket tölts ki, a másik nevelőre vonatkozó kérdésekre ne válaszoljon.

3. Előfordulhat, hogy gyermekkorában a családi helyzet, vagy az Ön nevelőjének személye megváltozott (például szülei elváltak, vagy nevelőszülőkhöz került). Ha az Ön életében ilyen változás történt, akkor kérjük, a kérdőívet arra az időszakra vonatkoztatva tölts ki, amelyben a leghosszabb ideig élt azonos nevelővel vagy nevelőkkel.
4. Minden egyes kérdésnél jelölje meg az „apja” (azaz vér szerinti apja vagy férfi nevelője) és az „anyja” (azaz vér szerinti anyja vagy női nevelője) Önnel kapcsolatos viselkedését leginkább jellemző válaszelehetőséget. Gondosan olvasson el minden kérdést és fontolja meg, hogy a lehetséges válaszok közül melyik írja le legpontosabban az Ön szüleinek viselkedését.

Gyermekkori nevelők (Kérjük, jelölje meg a helyes választ!)

- Gyermekkoromban végig ugyanaz(ok) a személy(ek) nevelt(ek).
- Gyermekkorom legnagyobb részében ugyanaz(ok) a személy(ek) nevelt(ek).
- Gyermekkoromban megváltozott, hogy kik nevelték. (Kérjük, írja le röviden, hogy a helyzet hogyan változott meg:))

Gyermekkor legnagyobb részében ki vagy kik nevelték fel Önt? (Kérjük, jelölje meg a helyes választ!)

- Vér szerinti szüleim nevelték fel.
- Csak vér szerinti anyám nevelt fel.
- Csak vér szerinti apám nevelt fel.
- Nevelőszülők nevelték fel.
- Csak nevelőanyám nevelt fel.
- Csak nevelőapám nevelt fel.
- Egyik édesszülöm és házas- vagy élettársa nevelt.
- Más személy(ek) nevelt(ek) fel. (Kérjük, írja ide, hogy ki vagy kik nevelték fel:))

1. A szüleim keményen bántak velem, vagy dühösesek voltak rám anélkül, hogy megmondták volna az okát.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

2. A szüleim dicsérték.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

3. Azt kívántam, bárcsak a szüleim kevesebbet aggódnának amiatt, amit csinálok.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

4. A szüleimtől gyakrabban kaptam testi fenytést, mint megérdemeltem.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

5. Miután hazaérkeztem, be kellett számolnom a szüleimnek arról, hogy mit csináltam, merre jártam korábban.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

6. Azt hiszem, szüleim megpróbálták serdülőkoromat stimulálva, érdekessé tenni.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

7. Szüleim mások előtt bíraltak engem.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

8. A szüleim megtiltották nekem, hogy megtegyek olyan dolgokat, ami a többi gyerek számára szabad volt, mert félték, hogy valami történhet velem.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

9. A szüleim arra ösztönöztek, hogy mindenben kiemelkedőt teljesítsek.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

2/4

10. Magatartásukkal, például azzal, hogy szomorúnak néztek ki, szüleim elérték, hogy büntudatot érezzek, mert rosszul bánok velük.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

11. Úgy vélem, túlzottan aggódtak amiatt, hogy történhet velem valami.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

12. Ha rosszul alakultak a dolgom, éreztem, hogy szüleim megpróbáltak vigasztalni és bátorítani.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

13. Úgy bántak velem, mint a család „fekete bárányával” vagy bűnbakjával.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

14. A szüleim szavaikkal és gesztusaikkal mutatták, hogy szeretnek.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

15. Úgy éreztem, hogy szüleim jobban szeretik fiú/lány testvéremet vagy testvéreimet, mint engem. (csak abban az esetben válaszoljon, ha volt testvére).

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

16. A szüleim elérték, hogy szégyelltem magam.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

17. Szüleim engedték, hogy menjek, amerre nekem tetszik, anélkül, hogy különösebben törődtek volna velem.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

18. Úgy éreztem, a szüleim mindenbe beleszóltak, amit csak tettem.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

19. Úgy éreztem, meleg és gyöngéd viszony van köztem és szüleim között.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

20. Szüleim pontos határokat szabtak, hogy mit szabad és mit nem szabad tennem, és ehhez szigorúan ragaszkodtak.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

21. A szüleim még kis vétség miatt is megbüntettek.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

22. A szüleim akarták eldönteni, hogy öltözködjem, vagy hogy nézzek ki.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

23. Úgy éreztem a szüleim büszkéek voltak, mikor sikert értem el valamiben, amire vállalkoztam.

	nem, soha	igen, időnként	igen, gyakran	igen, a legtöbbször
Apa	1	2	3	4
Anya	1	2	3	4

24. Serdülőkoromban szerettem az apámat.

(Egyáltalán nem) 1 2 3 4 5 6 7 8 9 10 (Nagyon)

25. Serdülőkoromban szerettem az anyámat.

(Egyáltalán nem) 1 2 3 4 5 6 7 8 9 10 (Nagyon)

26. Most szeretem az apámat.

(Egyáltalán nem) 1 2 3 4 5 6 7 8 9 10 (Nagyon)

27. Most szeretem az anyámat.

(Egyáltalán nem) 1 2 3 4 5 6 7 8 9 10 (Nagyon)

Kérjük, ellenőrizze, hogy minden kérdésre válaszolt-e!
Köszönjük, hogy kitöltötte a kérdőívet!

APPENDIX D. ECS

KÉRDŐÍV A TÁRSAS ÉRZELMEKRŐL

Az alábbiakban olyan állításokat közlünk, amelyek másokhoz fűződő érzelmekre vonatkoznak. Kérjük, gondosan olvassa el ezeket az állításokat, és ítélje meg, hogy mennyire ért velük egyet!

	Soha	Ritkán	Gyakran	Mindig
Ha valaki, akivel éppen beszélgetek, elkezd sírni, az én szemem is könnyessé válik.				
Ha rossz a hangulatom, feldob, ha egy jókedvű emberrel vagyok együtt.				
Ha valaki melegen rám mosolyog, én visszamosolygok és melegséget érzek a szívemben.				
Elszomorít, ha az emberek szeretteik haláláról beszélnek.				
Összeszorítom az állkapcsomat és összehúzom a vállaimat, ha dühödt arcokat látok a híradóban.				
Ha belenézek a szerelmem szemébe, romantikus gondolataim lesznek.				
Iritál, ha dühös emberek vesznek körül.				
Amikor a híradóban látom az áldozatok félelemmel teli arcát, mindig arra kell gondolnom, vajon mit éreznek.				
Elolvadok, ha a szerelmem szorosan átölel.				
Feszült leszek, ha dühödt veszekedést hallok.				
Ha vidám emberek között vagyok, nekem is vidám gondolataim lesznek.				
Beleremegek, amikor a szerelmem hozzám ér.				
Észreveszem, hogy feszült leszek, ha túlhajszolt emberekkel vagyok körülvéve.				
Elsírom magam egy szomorú filmen.				
Ha a fogászati rendelő várójában ülve hallok egy ijedt gyerek sikolyait, én is megrémülök.				

Köszönjük, hogy kitöltötte a kérdőívet!

APPENDIX E. TAS-20

TAS-20

Ez a kérdőív az Ön érzelmeivel kapcsolatos állításokat tartalmaz. Kérjük, jelölje meg az ötfokú skálán, milyen mértékben ért egyet vagy nem ért egyet a következő mondatok tartalmával Önre vonatkoztatva!

**1 – Határozottan nem értek egyet; 2 – Nem értek egyet;
3 – Egyet is értek, meg nem is; 4 – Egyetértek; 5 – Határozottan egyetértek**

1.	Gyakran összezavarodom, milyen érzelmet is érzek.	1	2	3	4	5
2.	Nehezen találok megfelelő szót az érzéseimre.	1	2	3	4	5
3.	Vannak olyan testi érzeteim, amit még az orvosok sem értenek.	1	2	3	4	5
4.	Könnyen le tudom írni az érzéseimet.	1	2	3	4	5
5.	Jobban szeretem elemezni a problémákat, mint csak leírni őket.	1	2	3	4	5
6.	Mikor nyugtalan vagyok, nem tudom, hogy szomorú, ideges vagy mérges vagyok igazán.	1	2	3	4	5
7.	A testemben lévő érzések gyakran nyugtalanítanak.	1	2	3	4	5
8.	Jobban szeretem hagyni, hogy a dolgok csak úgy történjenek velem, mintsem igyekezzek megérteni, miért is változtak ilyen módon.	1	2	3	4	5
9.	Vannak olyan érzéseim, amiket nem tudok teljes mértékben azonosítani.	1	2	3	4	5
10.	Az érzelmek tudatosítása alapvető dolog.	1	2	3	4	5
11.	Számomra nehéz leírni, hogy érzek más emberekkel kapcsolatban.	1	2	3	4	5
12.	Gyakran mondják nekem, hogy fejezzem ki még jobban az érzéseimet.	1	2	3	4	5
13.	Nem tudom, mi megy végbe bennem.	1	2	3	4	5
14.	Gyakran nem tudom, miért vagyok mérges.	1	2	3	4	5
15.	Jobban szeretek másokkal a napi tevékenységükről beszélgetni, mint az érzelmeikről.	1	2	3	4	5
16.	Szívesebben nézek könnyű szórakoztató műsorokat, mint pszichológiai drámát.	1	2	3	4	5
17.	Nehezen tárom fel a legbelsőbb érzelmeimet, még a közeli barátoknak is.	1	2	3	4	5
18.	Közel tudom magam érezni valakihez még a néma pillanatokban is.	1	2	3	4	5
19.	Hasznosnak tartom az érzéseim vizsgálatát a személyes problémák megoldásában.	1	2	3	4	5
20.	Rejtett jelentések keresése elvonja a figyelmet a filmek és színházi darabok élvezetétől.	1	2	3	4	5

APPENDIX F. AIM

ABS

Név: Dátum:

Az alábbiakban néhány megállapítást talál. Olvassa el figyelmesen valamennyit, és mindegyikre vonatkozóan karikázza be azt a számot, amelyik leginkább megfelel hipnózis alatti érzéseinek. A növekvő értékek fokozatos átmenetet jelentenek a két szélső érték között. Nincsenek helyes vagy helytelen válaszok, ne gondolkozzon túl sokat, hanem a hipnózisbeli érzéseit legjobban kifejező számot jelölje meg.

	Egyáltalán nem éreztem így	Nagyon erősen így éreztem
1. Néha úgy éreztem, hogy nagyon erősen kötődöm a hipnotizőrhez. Olyan érzés volt ez, amit általában csak a szüleim, egyes tanárain és a legjobb barátaim iránt érzek.	1 2 3 4 5 6 7	
2. Nem is tudom miért, de valahogy tényleg nagyon a hipnotizőr kedvében akartam jární.	1 2 3 4 5 6 7	
3. Úgy tűnt, hogy a hipnotizőr minden szava és tette valahogy befolyásolta az érzéseimet.	1 2 3 4 5 6 7	
4. Úgy éreztem, hogy minden, amit a hipnotizőr tett és mondott, mélyen érint.	1 2 3 4 5 6 7	
5. Amíg hipnózisban voltam, szinte tökéletesnek éreztem a hipnotizőrt.	1 2 3 4 5 6 7	
6. Úgy éreztem, hogy a hipnotizőr erős és hatalmas.	1 2 3 4 5 6 7	
7. Úgy éreztem, hogy a hipnotizőr nagyon bölcs.	1 2 3 4 5 6 7	
8. Rendkívüli csodálatot éreztem a hipnotizőr iránt.	1 2 3 4 5 6 7	
9. Valahogy jólesett részesülni a hipnotizőr hatalmában.	1 2 3 4 5 6 7	
10. Igazán akartam, hogy a hipnotizőr úgy találja, hogy jól csinálom a dolgokat.	1 2 3 4 5 6 7	
11. Valahogy inkább szüleivel lévő gyermeknek éreztem magam, mintsem egy hipnotizőrrel lévő felnőttnek.	1 2 3 4 5 6 7	
12. Úgy éreztem, hogy a hipnotizőr a vezető, én pedig a követője vagyok.	1 2 3 4 5 6 7	
13. Azt akartam, hogy a hipnotizőr vigyázzon rám, amíg hipnózisban vagyok.	1 2 3 4 5 6 7	
14. Azt akartam, hogy a hipnotizőr mondja meg, mit tegyek.	1 2 3 4 5 6 7	
15. Azt akartam, hogy a hipnotizőr rám figyeljen.	1 2 3 4 5 6 7	
16. Amikor nem tudtam megtenni, amit a hipnotizőr mondott, lelki furdalásom támadt.	1 2 3 4 5 6 7	
17. Aggasztott, hogy a hipnotizőr nem kedvel majd.	1 2 3 4 5 6 7	
18. El akartam kerülni, hogy a hipnotizőr csalódjon bennem.	1 2 3 4 5 6 7	
19. El akartam kerülni, hogy a hipnotizőr megharagudjon rám.	1 2 3 4 5 6 7	
20. Volt, amikor taszított a hipnotizőr. Olyan érzés volt ez, amit általában csak a szüleivel, egyes tanáraival és barátaival kapcsolatban érez az ember.	1 2 3 4 5 6 7	
21. Nem is tudom miért, de valahogy néha kifejezetten a hipnotizőr ellenére akartam tenni.	1 2 3 4 5 6 7	
22. Valahogy rosszul esett, hogy szinte eltörpültem a hipnotizőr mellett.	1 2 3 4 5 6 7	

APPENDIX G. PCI

PCI

Név:..... Dátum:

Instrukció

Ezen a kérdőíven a belső szubjektív élményeit, illetve a kérdéses időszakot az alábbiakhoz hasonló állítások mentén ítélni majd meg. A szubjektív élményeit a felsorolt állítások szerint értékelje.

1.	Nagyon nyugodtnak érzem magam	0 1 2 3 4 5 6	Nagyon idegesnek érzem magam.
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Ezt úgy tegye majd meg, hogy az alább következő minden egyes tételnél karikázza be azt a számot, amelyik leginkább megfelel a kérdéses időszak alatti szubjektív élményeinek. Például: ha a kérdéses időszak alatti hangulatát „nagyon nyugodtnak” itéli, és egyáltalán nem jellemző, hogy „nagyon ideges” lett volna, akkor karikázza be a 0-t ennél a kérdésnél, ami a kérdőív első tételének felel meg.

Ezzel szemben, ha úgy érzi, hogy se az nem igaz, hogy „nagyon nyugodt” lett volna, sem pedig, hogy „nagyon ideges”, vagyis valahol a kettő között volt, akkor a válaszlapon a 3-at karikázza be. Ha a 0-t karikázza be, az azt jelenti, hogy élménye nagyon hasonló volt a baloldali állításban megfogalmazotthoz, ha pedig a 6-ot, akkor az arra utal, hogy az élménye a jobboldali állításban megfogalmazottnak felel meg. Ha a 0 és a 6 közötti számok valamelyikét karikázza be, az azt jelenti, hogy élménye valahol a bal- és jobboldali állítás között volt. Teljesen szabadon választhat bármelyik szám közül 0-tól 6-ig.

Tehát minden tétel esetében karikázza be azt a számot, ami leginkább megfelel a kérdéses időszak alatti élményeinek. Kérjük, hogy ezt az elkövetkezendő oldalakon található minden egyes tételnél tegye meg, igyekezzen olyan pontosan válaszolni, amennyire csak tud.

Annak érdekében, hogy minél jobban meghatározhassa a szubjektív élményeit, leírjuk, hogy milyen értelemben használjuk a következő oldalakon az egyes kulcsfontosságú kifejezéseket:

1. **ÉRZÉSEK** (testi szenzációk): belső testi érzések, amelyek tudatosulnak önben: viszketés, nyomás, fájdalom, melegség, hűvös-érzés tartoznak az ilyen érzékletek körébe.
2. **ÉRZÉKELÉSEK** (percepciók): azok a benyomások, amik a külvilág felől érik. Az érzékleteket a környezetünkből képek, hangok, szagok útján vesszük fel.
3. **ÉRZELMEK**: belső benyomások vagy hangulatok pl. boldogság, öröm, harag, izgatottság, stb.
4. **GONDOLATOK**: belső szavak, mondatok, és olyan megfogalmazások, amelyek önmagának szólnak.
5. **KÉPEK** vagy **KÉPZELETEK**: vizuális (látvány), hallási (hangok), testérzési (bőrön vagy a testében), szaglási (szagok) vagy ízérzékelési (íz) benyomások vagy képek, amelyek feltűnnek a képzeletében, függetlenül attól, hogy mennyire homályosak vagy tűnékenyek. Ezek belülről erednek, és nem a külvilágból jönnek.
6. **BENYOMÁSOK** vagy **ESEMÉNYEK**: a fentiek bármelyike (pl. észlelések, érzékelések, gondolatok vagy képzeletek).



PCI I.

Kérjük, hogy minden megállapítást gondosan és figyelmesen olvasson el, és válaszoljon a lehető legpontosabban: a válaszlapon jelölje meg azt a számot, amelyik a legjobban megfelel (a kérdéses idő alatt) szubjektív élményeinek.

1.	Végig nyugtalan, zavart voltam, képtelen voltam bármire is koncentrálni.	0 1 2 3 4 5 6	Jól tudtam koncentrálni, egyáltalán nem voltam nyugtalan (zavart).
2.	A gondolkodásom tiszta és világos volt.	0 1 2 3 4 5 6	A gondolkodásom zavaros, nehezen érthető volt.
3.	A felmerülő gondolatokat és képeket én irányítottam, magam határoztam el, hogy mire fogok gondolni vagy mit fogok elképzelni.	0 1 2 3 4 5 6	A felmerülő gondolatok és képek maguktól jöttek, anélkül, hogy kontrolláltam volna azokat.
4.	Olyan élményem volt, melyet nagyon vallásosnak, lelkinek vagy transzcendensnek nevezhetnék leginkább.	0 1 2 3 4 5 6	Nem volt olyan élményem, melyet vallásosnak, lelkinek vagy transzcendensnek nevezhetnék.
5.	Nagyon erős szexuális érzéseim voltak.	0 1 2 3 4 5 6	Nem voltak szexuális érzéseim.
6.	Közben hangtalanul sokat beszéltem magamban.	0 1 2 3 4 5 6	Közben egyáltalán nem beszéltem magamban, hangtalanul.
7.	Nagyon nagy szomorúságot éreztem.	0 1 2 3 4 5 6	Egyáltalán nem éreztem szomorúságot.
8.	A figyelmem teljesen saját, belső szubjektív élményeimre irányult.	0 1 2 3 4 5 6	A figyelmem teljesen a külvilág felé irányult.
9.	Eksztázist és örömet éreztem.	0 1 2 3 4 5 6	Nem éreztem eksztázist vagy örömet.
10.	Nem tudok visszaemlékezni arra, hogy milyen élményeim voltak.	0 1 2 3 4 5 6	Pontosan emlékszem minden élményemre.
11.	Testem befejeződött a bőröm és a külvilág találkozásánál.	0 1 2 3 4 5 6	Úgy éreztem, mintha a testem kiterjedt volna, túl a bőröm és a külvilág találkozásánál.
12.	Nagyon sok vizuális élményem volt, sok kép jelent meg előttem.	0 1 2 3 4 5 6	Egyáltalán nem voltak vizuális élményeim, nem voltak képek.
13.	Egyáltalán nem voltam tudatában annak, hogy tudatában vagyok önmagamnak (a velem törtéteknek). Nem volt én-tudatom.	0 1 2 3 4 5 6	Teljesen tudatában voltam annak, hogy tudatában vagyok önmagamnak. Erős volt az én-tudatom.
14.	Egyáltalán nem éreztem magam dühösnek.	0 1 2 3 4 5 6	Dühösnek éreztem magam.
15.	Teljesen megváltozott az, ahogyan az időt észleltem.	0 1 2 3 4 5 6	Nem vettem észre, hogy másképpen éreztem volna az idő múlását.
16.	Nagyon rémültnek éreztem magam.	0 1 2 3 4 5 6	Nem éreztem magam rémültnek.
17.	Egészen megváltozott az, ahogyan a világot észleltem.	0 1 2 3 4 5 6	Nem vettem észre, hogy másként észleltem volna a világot.



18.	A vizuális képzeletem egészen élénk és három dimenziós volt, valósnak tűnt.	0 1 2 3 4 5 6	A vizuális képzeletem igen halvány és diffúz volt. Nehéz volt bármit is elképzelni.
19.	Az izmaimat nagyon feszesnek, feszültnek éreztem.	0 1 2 3 4 5 6	Az izmaimat nagyon lazának, ellazultnak éreztem.
20.	Egyáltalán nem éreztem a szeretet érzését.	0 1 2 3 4 5 6	Nagyon erősen éreztem a szeretet érzését.
21.	A tudatom nem tért el a szokásostól, nem volt semmi szokatlan.	0 1 2 3 4 5 6	A szokásostól igen eltérő, szokatlan tudatállapotot éreztem.
22.	Semmit sem tudok felidézni abból, ami történt velem.	0 1 2 3 4 5 6	Mindent fel tudok idézni abból, ami történt velem.
23.	Tiszteletet és megbecsülést éreztem a világ iránt.	0 1 2 3 4 5 6	Nem éreztem tiszteletet és megbecsülést a világ iránt.
24.	A gondolkodásom tiszta és világos volt.	0 1 2 3 4 5 6	A gondolkodásom zavaros, kusza volt.
25.	Teljesen kontrolláltam azt, hogy mire figyelek.	0 1 2 3 4 5 6	Egyáltalán nem kontrolláltam azt, hogy mire figyelek.
26.	Testi érzéseim mintha kiterjedtek volna a külvilágba.	0 1 2 3 4 5 6	A testi érzéseim a bőrömön belülré korlátozódtak.
27.	Végig teljesen tudatában voltam önmagamnak.	0 1 2 3 4 5 6	Elvesztettem az én-tudatomat.
28.	A figyelmem teljesen a körülöttem levő világra irányult.	0 1 2 3 4 5 6	A figyelmem teljesen befelé, saját belső, szubjektív élményeim felé irányult.
29.	A körülöttem levő világ színe és alakja egészen megváltozott.	0 1 2 3 4 5 6	Nem éreztem másnak a körülöttem levő világ színét vagy formáját.
30.	Úgy tűnt, hogy az idő nagyon gyorsan vagy lassan telt.	0 1 2 3 4 5 6	Nem éreztem másnak az idő múlását.
31.	Nem éreztem csüggedtnak vagy boldogtalannak magam.	0 1 2 3 4 5 6	Boldogtalannak, csüggedtnak éreztem magam
32.	Nem éreztem, hogy hirtelen a szokásosnál jobban megérteném a dolgok lényegét.	0 1 2 3 4 5 6	Nagyon határozottan éreztem, hogy bizonyos dolgokat hirtelen világosan értek.
33.	Nagyon mérgesnek, felindultnak éreztem magam.	0 1 2 3 4 5 6	Nem éreztem mérgesnek, felindultnak magam.
34.	Nem zavart semmi, képes voltam teljesen elmerülni az élményeimben.	0 1 2 3 4 5 6	A külső hatások, események végig zavartak.
35.	Egyáltalán nem éreztem szexuális érzéseket.	0 1 2 3 4 5 6	Nagyon erős szexuális érzéseket éreztem.
36.	A gondolkodásom irracionális volt, nagyon nehéz volt megérteni.	0 1 2 3 4 5 6	A gondolkodásom logikus volt, könnyű volt megérteni.

37.	Nem éreztem merevnek, feszültnek magam.	0 1 2 3 4 5 6	Merevnek, feszültnek éreztem magam.
38.	Emlékeim, melyeket átéltem, nagyon tiszták és élénkek voltak.	0 1 2 3 4 5 6	Az átélt emlékeim nagyon homályosak, ködösek voltak.
39.	Nem éreztem, hogy a körülöttem levő világ mérete, alakja vagy látványa megváltozott volna.	0 1 2 3 4 5 6	A körülöttem levő világ mérete, alakja vagy látványa megváltozott.
40.	A tudatom a szokásostól nagyon eltérő volt.	0 1 2 3 4 5 6	A tudatom nem különbözött a szokásostól.
41.	Feladtam a kontrollt, passzívan befogadtam az élményeimet	0 1 2 3 4 5 6	Akarattal kontrolláltam az élményeimet.
42.	Nem éreztem rémületet vagy félelmet.	0 1 2 3 4 5 6	Félelmet és nagy rémületet éreztem.
43.	Nem éreztem az időtlenség érzését, az idő úgy ment, ahogy szokott.	0 1 2 3 4 5 6	Az idő megállt, egyáltalán nem ment.
44.	Egyáltalán nem voltak képi élményeim vagy csak nagyon kevés.	0 1 2 3 4 5 6	Az élményeim majdnem teljesen képekből álltak.
45.	Közben egyáltalán nem beszéltem magamban, csendben.	0 1 2 3 4 5 6	Közben sokat beszéltem magamban, csendben.
46.	Nem éreztem a szokásos érzéseimen túl eksztázist vagy boldogságot.	0 1 2 3 4 5 6	Eksztázist vagy nagy boldogságot éreztem.
47.	Nem éreztem a szokásostól eltérő vallásos (misztikus) érzéseket, vagy a lét mély értelmét.	0 1 2 3 4 5 6	A lét mélyen misztikussá, jelentéstartóvá vált.
48.	Az elképzelt dolgok nagyon halványak, homályosak voltak	0 1 2 3 4 5 6	Az elképzelt dolgok olyan tiszták és élesek voltak, mintha valóban láttam volna azokat.
49.	Erősen éreztem a szeretet érzését.	0 1 2 3 4 5 6	Nem éreztem a szeretet érzését.
50.	Egész idő alatt erősen tartottam az öntudatom.	0 1 2 3 4 5 6	Nem tartottam meg az öntudatom egyáltalán.
51.	Végig nagyon erősen fenntartottam azt az érzést, hogy a környezet és én különállóak vagyunk.	0 1 2 3 4 5 6	Erős egységet éreztem a világgal, köztem és a környezet között eltűntek a határok.
52.	A figyelmem teljesen befelé irányult.	0 1 2 3 4 5 6	A figyelmem teljesen kifelé irányult.
53.	A tudatállapotom nem volt szokatlan, nem tért el attól, amilyen lenni szokott.	0 1 2 3 4 5 6	Különlegesen szokatlan tudatállapotban éreztem magam, eltért attól, amilyen lenni szokott.

APPENDIX H. SCORING OF PCI-5

Table 70 | Transforming the 12 + 14 factors of PCI to a 5-factor solution (Kumar et al., 1996)

First- and Second-Order subscales of PCI (12 + 14-factor solution)	PCI (5-factor solution)				
	Dissociative Control	Positive Affect	Negative Affect	Visual Imagery	Attent. to Internal Processes
Altered experience					
Altered body image	.348	.262			
Altered time sense	.399				.446
Altered perception	.325	.193			.336
Altered meaning	.232	.466			
Positive affect					
Joy		.775			
Sexual excitement		.604			
Love		.809			
Negative affect					
Anger			.581		
Sadness			.600		
Fear			.615		
Attention					
Direction (inward)					.411
Absorption					.423
Visual imagery					
Amount	.166			.477	
Vividness				.981	-.115
Self-awareness	-.815				
Altered state of awareness	.512				.478
Arousal			.402		
Rationality	-.766		-.173		
Volitional control	-.783				
Memory	-.651				
Internal dialogue	-.150				.377
Reliability index					

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