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# RECALLED PARENTAL REARING STYLE AND DIMENSIONS OF HYPNOTIC RESPONSE

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**Abstract:** So far, only a few studies have investigated how memories of parental rearing style are associated with hypnotic response, and these were either qualitative or confined to the behavioral aspect of hypnotizability. The present study aims to employ standardized, quantitative measures to investigate the associations between recalled parental rearing style and the behavioral, phenomenological, and emotional dimensions of hypnotic response. Two samples of healthy adult subjects ( $N = 438$ ) completed a questionnaire on their parents' behavior and participated in a standard group hypnosis session in which their hypnotizability score, hypnotic experiences, and archaic involvement were assessed. Memories of cold and punishing parental behavior were associated with negative experiences related to the hypnotic state and negative emotions toward the hypnotist. The authors conclude that assessing parental behavior may be important in planning hypnotherapeutic interventions.

The relationship between the subject or client and the hypnotist, in a certain way, is similar to that between the child and the parent.

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Freud abandoned hypnosis because he noticed that the hypnotic state provoked too intense feelings of transference, which he compared to the infant–parent relationship (Bachner-Melman & Lichtenberg, 2001). Hypnosis can be understood as a form of topographic regression in which the mature and logical secondary-process reasoning shifts to a symbolic primary-process way of thinking (Nash, 2008), which is also characteristic of childhood. In psychoanalytic approaches to hypnosis, this emotional link is conceptualized as archaic involvement: The hypnotist has a representation in the hypnotized subjects' mind that is similar to authority figures—often the parents—from their earlier life (Shor, 1962). Archaic involvement is an important element of the hypnotic relationship (Nash & Spinler, 1989).

The hypnotherapist can use this emotional bond to correct maladaptive early object relationships (Eisen, 1993) and to help patients break free from paralyzing patterns in behavior and thinking (Bányai, 2008a). One of the most important corrective characteristics of hypnosis is the high level of interactional synchrony between the subject/patient and the hypnotist, which again shows a high similarity to the behavioral and affective synchrony between the child and the parent. Investigations carried out by our research group since the 1980s have demonstrated that interactional harmony may occur not just in therapeutic but in experimental hypnosis as well. Synchrony can be observed in the behavioral, emotional, phenomenological, and psycho-physiological variables in both the subject and the hypnotist (Varga, 2013).

Despite these similarities, to the best of our knowledge, no studies have investigated how actual parental rearing impacts adult hypnotic response. To understand this developmental pathway best, a longitudinal study should be conducted by following up on the relationship between children and their parents from the children's birth to their young adulthood. This would be a lengthy and cost-intensive project.

Nevertheless, we can also make inferences on the role of parental behavior on the adult subjects' hypnotic response if we ask them to recall their childhood experiences. The working models of attachment children carry (Bowlby, 1979/2005) and their memories of parental behavior may shape their involvement in hypnosis, even in adulthood. In a study of patients with eating disorders, Tereno, Soares, Martins, Celani, and Sampaio (2008) found that patients' memories of their parents' rearing style were strongly associated with their adult attachment style. Higher recalled parental support and lower parental rejection were also correlated with a better emotional bond with the therapist, which indicates that memories of the parents may influence the psychotherapeutic alliance.

It may seem difficult to draw a direct link between the caregiver–infant attachment and adult responses to hypnosis. Posner and Rothbart (2011), however, offered a promising theory in which they

connected early infant to child development to certain characteristics of the hypnotic state. They found that in early infancy control over emotions and thoughts is closely connected to parental interventions and is exercised through an orienting brain system. One parental strategy to soothe an upset baby is introducing a new object (Harman, Rothbart, & Posner, 1997). Such a soothing technique activates the anterior cingulate cortex (ACC) and other areas involved in the executive attentional network in the baby's brain. A hypnotic altered state of consciousness—and even the level of hypnotizability—is associated with modulated activity of the ACC (Faymonville, Boly, & Laureys, 2006; Gruzelier, 2006; Hoeft et al., 2012). Indeed, this modulation seems to be driven by hypnotic suggestions (Raz, Fan, & Posner, 2005; Raz, Shapiro, Fan, & Posner, 2002). Hypnosis may induce stronger reliance on the early developing orienting network (and, at the same time, less on the later developing executing network), which will cause “the susceptible person to be ‘under the influence of external control.’ Just as in early development the child's control rests with the caregiver, during hypnosis the adult's control is given to the hypnotist” (Posner & Rothbart, 2011, p. 3). This suggests that warm and responsive parental behavior—which is associated with secure attachment style—leads to higher adult hypnotizability, although the effects of socialization and later life events (for instance, traumatic experiences) might mask or eliminate this link (Butler, Duran, Jasiukaitis, Koopman, & Spiegel, 1996).

Although this hypothesis needs empirical evidence from longitudinal studies, it seems feasible that the infant-caregiver attachment, in this way, has an influence on adult hypnotic capacity.

#### RECALLED PARENTAL REARING STYLE AND HYPNOTIC RESPONSE: MULTIPLE PATHWAYS

In a large-scale qualitative study, J. Hilgard (1979) and colleagues conducted more than 1,200 semistructured interviews with young adults, covering various aspects of their upbringing and childhood experiences. Special emphasis was given to the characteristics of the parents (i.e., their warmth/coldness, disciplining behavior, temperament, involvement in playful or absorbing activities). Another key element of the interviews was identification with the parents (i.e., which parent a subject had most in common with), and the subjects' relationship with their parents. Two kinds of children tended to show high proneness to dissociation. Those who described their parents as warm and caring also reported observing their parents pursuing dissociative activities (reading, gardening, etc.). These children showed a “contagion” for similar activities through identification with their parents. Those who identified with at least one of their parents were

more hypnotizable than those who identified with neither parent. Following the interviews, their hypnotic capacity was assessed with the Stanford Hypnotic Susceptibility Scale, Form C (SHSS:C; Weitzenhoffer & Hilgard, 1962). Identification with the opposite-gender parent was associated with a somewhat (but not significantly) higher hypnotizability score. However, when correlation between parental warmth was calculated across gender of the subjects and gender of the parents, only maternal warmth seemed to show a significant low-level association with male subjects' hypnotizability:  $r = .24, p = .05$ . (Paternal warmth and female subjects' susceptibility, albeit not significantly associated, correlated within a similar magnitude:  $r = .18, ns$ .)

On the other hand, the interviews suggested that many interviewees who reported frequent parental punishment turned out to be highly hypnotizable as adults. There was a significant correlation between severity of punishment and adult hypnotizability ( $r = .30, p < .05^1$ ). Hilgard (1979) posited two pathways that lead to high adult hypnotic susceptibility. One is through identification and conformity with the warm, caring parent who sets consistent limits. There is, however, another pathway: Those who recalled cold (abandoning, unresponsive) and strict parents used reading and other dissociative strategies (like imaginary friends) to escape "harsh reality" in their childhood, which in many cases also led to high adult hypnotizability.

Interestingly, even some of the highly punished but low hypnotizable adults expressed a wish to be good hypnotic candidates. For instance, an interviewee stated, "I've always wanted to be hypnotized. ... I think I'll be a good subject" (Hilgard, 1979, p. 216). This leads to two rarely investigated questions in studies on hypnotic phenomena: what the subjects *anticipate* about hypnosis and how they *feel* under hypnosis.

High hypnotizability is associated with dissociative proneness (Hilgard, 1974; Tellegen & Atkinson, 1974). Hilgard's findings support that recalled parental behavior may be linked to adult hypnotic susceptibility through the different dissociative "pathways" the children developed. She suggested that parental warmth and parental punishment seem to act independently from each other to some extent; therefore, they should be treated as separate contributors to adult hypnotizability.

Rhue and Lynn (1987) investigated the developmental origins of fantasy-prone personality and its associations with hypnotizability in young adults. Fantasy-prone subjects reported more frequent and severe (physical) parental punishment than those who had lower

<sup>1</sup>The  $p$ -value was calculated based on data provided by J. R. Hilgard (1979).

propensity to fantasize. Many times, they used imagery to cope with punishment. However, they were as positive about their early home environments as the non- or low fantasizers, which again demonstrates that punishment and parental warmth are not necessarily exclusive of each other. The authors replicated the association between parental punishment, fantasy proneness, and adult hypnotizability using various measures (Lynn & Rhue, 1988). However, Rhue (2004) concluded that there is still a pressing need for studying the developmental pathways to high hypnotizability.

## AIMS OF THE PRESENT STUDY

### *Applying a Standardized Quantitative Measure of Parental Behavior*

Since the works of Hilgard (1979) and Lynn and Rhue (1988), more quantitative measures have been developed that offer a relatively quick and easy way to collect data on recalled parental behavior. For instance, the short form of the Swedish My Memories on Upbringing (EMBU) questionnaire (Arrindell et al., 1999) became available. The EMBU items tap into parents' rejection, emotional warmth, and over-protective behaviors. A fourth operational factor can be calculated from the items, measuring parental punishment (Költö, 2008, 2015). It seems feasible to test the developmental "pathways" theory of Hilgard (1979) and to try to replicate her qualitative findings on the association between parental warmth, parental punishment, and adult hypnotizability. Based on her findings, we hypothesized that a small-to-medium correlation between the factors of parental behavior and hypnotizability scores would be found.

We also wanted to investigate the proportion of parental rearing style that explains the variance in hypnotic susceptibility. So far, the most comprehensive study that aimed to map psychological factors predicting hypnotizability (Lichtenberg, Bachner-Melman, Ebstein, & Crawford, 2004) found that persistence, focused attention, absorption, and genetic variation in the level of catechol-*O*-methyltransferase (COMT) enzyme explained 33.6% of the variance in SHSS:C scores. There were remarkable gender differences. A multiple regression model with the same predictors accounted for 29% variance of hypnotizability in men and 43.8% variance of hypnotizability in women. We hypothesized that parental behavior may also explain a small but significant slice of the "hypnotizability pie."

### *Applying Group Hypnotizability Scales*

The outlined studies were conducted using individually administered hypnotizability scales; since then, group methods have become available, allowing for a more economical way of testing hypnotic

susceptibility. Bowers (1993, 1998) developed the Waterloo-Stanford Group Scale of Hypnotic Susceptibility, Form C (WSGC), a group version of the individual SHSS:C). The SHSS:C and the WSGC contain many cognitive-perceptual test suggestions, including taste hallucination, age regression, and dream. However, their use requires caution (Cardena & Terhune, 2009). The question arises as to whether other methods that are easier to administer would fit the aims of such an association study. Weitzenhoffer and Hilgard (1959) constructed the individually administered Stanford Hypnotic Susceptibility Scale, Form A (SHSS:A), which contains more direct motor (e.g., left-hand lowering) and motor challenge (e.g., finger interlock) suggestions than the SHSS:C. A group version of this scale has also been developed: the Harvard Group Scale of Hypnotic Susceptibility, Form A (Shor & Orne, 1962), which has become a widely used method of assessing hypnotizability (Barnier & McConkey, 2004). Therefore, we wanted to test whether the correlational pattern identified by Hilgard (1979) could also be found if we applied a group hypnotizability assessment: namely, the WSGC and the HGSHS:A scales. Although these two were found to be highly associated (the total scores show a correlation of  $r = .77$ ; Bowers, 1993), they are not identical. We wanted to compare how memories of parental behavior are associated in the two different scales. We hypothesized that despite the differences between individual and group testing, the latter will yield associations similar to those found in individual assessments.

#### *Including Phenomenology and Archaic Involvement in Hypnosis*

The subjective reports of the interviewees in the study of Hilgard (1979) raise the issue of how people actually feel in hypnosis and how their feelings toward hypnosis and the hypnotist are associated with their childhood memories.

Shor (1962) conceptualized hypnosis as a three-dimensional phenomenon. In his opinion, hypnotic depth constitutes a behavioral aspect (involvement in the role of a hypnotized person), a phenomenological component (the subjective feeling of trance), and an emotional dimension (archaic involvement). The social-psychobiological model of hypnosis (Bányai, 1991, 2008b) integrates these three components. The empirical evidence collected since 1973 (e.g., Költő, Gösi-Greguss, Varga, & Bányai, 2014; Varga, 2013) confirmed the validity of Shor's concept and the feasibility of the social-psychobiological model.

Hilgard's (1979) study gave important insights into the developmental origins of the hypnotic response but did not include measures of hypnotic trance and archaic involvement, although these may also be associated with parental rearing style. Archaic involvement includes a fear of negative appraisal coming from the hypnotist (e.g.,

subjects may want to avoid the hypnotist's displeasure with their hypnotic performance; Nash & Spinler, 1989). It seems reasonable to assume that frequently punished children will grow into adults who show this kind of fear of displeasing the hypnotist. On the other hand, if it is true that imaginative involvement mediates between parental punishment and adult high hypnotizability, we may expect that frequently punished subjects will also experience higher levels of dissociation.

The third aim of the present study was to test whether recalled parental behavior is related to the phenomenological dimension (e.g., dissociation and positive/negative feelings in hypnosis) and to the emotional dimension (archaic involvement and transference toward the hypnotist) of hypnosis. Based on the "multiple pathways" model of Hilgard (1979), we hypothesized that both warm-caring and cold-punishing parental styles will be associated with higher involvement in hypnosis. Because Hilgard found that the opposite-gender parent seems to have a larger bearing on adult hypnotic involvement, we also wanted to test her findings in a quantitative way, breaking the analyses down to the gender of the parents and the subjects.

## METHOD

### *Sample*

We employed samples from two separate studies in which hypnotizability was tested with the WSGC and HGSHS:A, respectively. The first group consisted of subjects participating in the studies of Szekely and colleagues (2010) and Gösi-Greguss, Bányai, and Varga (2010), with 17 additional male subjects, tested immediately after these studies, for a more balanced gender distribution. These additional subjects were recruited in the same way as in the two above-mentioned studies, and their demographic characteristics were similar to those in the main samples. The subjects did not receive credits, money, or any other kind of remuneration for taking part in the study.

In sum, 196 subjects were included in the first sample: 127 (65%) females and 69 (35%) males. Their ages were between 19 and 39 years, with a mean of 23.93 ( $SD = 4.69$ ). No gender difference was observed in the age of the subjects:  $t(194) = 1.333$ ,  $p = .184$ . Most subjects were undergraduate university students from different fields (psychology, natural sciences, medicine, humanities), and some were young adults working in the same areas.

Sample 2 consisted of 246 subjects from the study of Költő (2015): 135 females (55%) and 111 males (45%). Their ages ranged from 18 to 68 years (mean: 28.26,  $SD = 9.63$ ). Ages of female and male participants did not differ significantly,  $t(244) = 0.672$ ,  $p = .251$ . Around one-



third of the participants were undergraduate psychology students, and the rest of the sample comprised students and adults from various disciplines/professions.

### *Determining Sample Size*

We conducted an *a priori* power analysis to check which sample size would be adequate for the statistical tests. For the power analysis we used G\*Power 3.1 software (Faul, Erdfelder, Lang, & Buchner, 2007). Power analysis was based on results from two earlier studies. Hilgard (1979) observed that maternal warmth showed a significant low-level association with male subjects' hypnotic susceptibility,  $r = .24$ ,  $p = .05$ . To replicate this finding with  $p = .05$  and a power of .90, a sample size of 178 subjects is needed. Using a threshold of  $p = .01$  and power = .90, the required sample size is 251 subjects. The other reference finding is that of Lichtenberg and colleagues (2004), who observed that within a hierarchical multiple regression analysis, two variables (persistence in attention and variation in the COMT gene) predicted 15.4% of hypnotic susceptibility,  $F = 7.94$ ,  $p = .001$ . If we wanted to demonstrate a similar sized effect, using a parental variable and age as predictors (with the thresholds  $p = .01$  and power = .90), the required sample size is 101; with thresholds of  $p = .05$  and power = .90, the required size drops to 73. Our samples—in gender breakdown—fall within these numbers rather closely: 127 females and 69 males (Sample 1), and 135 females and 111 males (Sample 2).

### *Procedure*

Subjects in Sample 1 were hypnotized using the WSGC scale (consisting of many cognitive-perceptual suggestions), whereas the second sample used the HGSHS:A scale (including mostly motor suggestions). Group hypnosis sessions followed the standard protocols. Hypnosis was administered live, by the first (A. K.) and the last authors (É. I. B.), and other licensed or candidate hypnotherapists. In sum, 24 sessions were conducted using the WSGC scale; average headcount in these sessions was eight subjects. The HGSHS:A was administered in 22 sessions, with an average headcount of 11 subjects.<sup>2</sup>

In addition to the behavioral aspect of hypnotizability, three measures were administered to subjects: the EMBU, the Archaic Involvement

<sup>2</sup>The WSGC was administered in smaller groups than HGSHS:A was. This is in line with the precautionary note of Cardena and Terhune (2009), who suggested not administering WSGC to subjects who have not been hypnotized before. Although, to the best of our knowledge, there were subjects who had not participated in hypnosis prior to the current investigation, we recruited fewer subjects to the WSGC groups, to reduce the risk of any unwanted side effects remaining unattended. In the debriefing phase after all hypnosis sessions, we encouraged the subjects to tell about their experiences, and the hypnotist was available for any personal discussions if the subjects required it.

Measure (AIM; Nash & Spinler, 1989), and the Phenomenology of Consciousness Inventory (PCI; Pekala, 1991). Due to technical and organizational reasons, in Sample 1 all subjects filled in paper questionnaires following the hypnosis sessions. In Sample 2, the EMBU was administered online, prior to the hypnosis sessions, whereas the AIM and PCI were administered after the hypnosis session.

Previous research on hypnosis and personality demonstrated that the order in which different measures are administered may create context effect, and correlations may be influenced by whether hypnotizability testing or personality assessment happened earlier (Council, 1993). Unfortunately, the circumstances of our study did not allow splitting the samples into two sections and administering the parental measure before or after hypnotizability testing. This limitation must be considered in comparing the associations between the EMBU factors and the different hypnotizability scales.

#### *Ethical Considerations*

Participation was entirely voluntary. Subjects did not receive any form of remuneration. Before the hypnosis sessions, all participants gave an informed consent for participation. Besides the hypnotist, a licensed cohypnotist participated in all sessions to attend to any possible adverse side effects. All investigations were carried out with adherence to the Professional Ethical Code of the Hungarian Psychological Association. For all standardized laboratory hypnosis sessions and the accompanying online and paper-based surveys, the Ethical Board sitting at Eötvös Loránd University, Faculty of Education and Psychology granted permission in Decision No. 2015/271.

#### *Measures*

*Parental rearing style.* Recalled memories of parents' behavior was assessed with the Hungarian version of the short EMBU questionnaire (Arrindell et al., 1999). This measure contains 23 Likert-type items the subjects fill in regarding their father and mother separately. The items are organized into three factors. *Rejection* refers to being neglected, punished, or publicly criticized by the parents. High scores on the *emotional warmth* factor reflects that the subject's parents treated her or him in a caring and warm style and expressed their love toward and pride in the subject. The *overprotection* factor contains items referring to parental control, restrictive behavior, and distress over the independent activities of the child. To be able to measure how much the parents punished the child (including physical punishment, strictness, and criticism/blaming of the subject), we developed a fourth, operational factor—*punishment*. This factor combines the relevant items from the rejection and overprotection scales.

Because there were no questions on family structure, we included only those subjects who gave responses to items both for fathers and mothers. Some subjects in Sample 1, however, expressed problems with filling in the questionnaire. Many mentioned that their parents had divorced, and one biological parent and her or his partner had raised them. Learning from this, we added a few questions on family structure to Sample 2 prior to the EMBU items. This allowed us to aggregate somewhat more data regarding mothers ( $N = 246$ ) than fathers ( $N = 229$ ).

### *Hypnotic Response*

*Behavioral hypnotizability.* In Sample 1, hypnotic responsiveness was assessed with the (hitherto unpublished) Hungarian version of the WSGC. This standardized measure consists of a hypnotic induction, 13 test suggestions (of which 12 count in the final score, which can be between 0 and 12), dehypnosis, and a debriefing phase. The scale contains test suggestions tapping into different hypnotic phenomena, including altered motor activities (e.g., moving hands together, arm rigidity), changes in perceptual-cognitive processing (experiencing a hallucinated mosquito or changes in taste); and complex hypnotic effects (such as dream or age regression).

In Sample 2, the measure used to assess the behavioral dimension of hypnotic responsiveness was the Hungarian version of the HGSHS:A (Költő, Gösi-Greguss, Varga, & Bányai, 2015). The HGSHS:A, originally developed by Shor and Orne (1962), has a structure similar to WSGC. However, it contains only two test suggestions tapping into perceptual-cognitive changes (fly hallucination and posthypnotic amnesia); the remaining suggestions are either facilitating direct motor response (e.g., eye closure or hand lowering) or motor challenge items (e.g., finger interlock or communication inhibition). In the HGSHS:A, the 12 test suggestions all count into the final score, which therefore varies between 0 and 12.

*Phenomenology of altered state of consciousness.* How the hypnotic state of the subjects differed from their everyday experiences was measured with the Hungarian version of the PCI (Szabó, 1989, 1993). The PCI, originally developed by Pekala (1982, 1991), taps into different experiential domains of any altered state of consciousness. Originally, the PCI contained 26 first- and second-order factors, which were later reduced by a z-transformation method to five factor-based scales (Kumar, Pekala, & Cummings, 1996; Varga, Jozsa, Banyai, Gosi-Greguss, & Kumar, 2001). *Dissociative control* reflects the extent of alterations in trance, associated with altered awareness and changes in body image, time sense, perception, visual imagery, meaning, memory, rationality, volitional control, and internal dialogue under

the given state. *Positive affect* includes the subscales of joy, sexual excitement, love, altered meaning, altered body image, and altered perception. *Negative affect* expresses the amount of anger, sadness, fear, arousal, and lack of rationality. *Visual imagery* reflects the amount and vividness of visual images. *Attention to internal processes* reflect the alterations in time sense and perception, being more absorbed in the given state, the attention being directed to inward processes, experiencing internal dialogue, and relatively low vividness of images.

*Archaic involvement.* Transference of the subjects toward the hypnotist was measured by the Hungarian version of the AIM (Bányai, Gösi-Greguss, Vágó, Varga, & Horváth, 1990). The AIM, originally developed by Nash and Spinler (1989), contains 19 Likert-type items that tap into the perceived power of the hypnotist, positive emotional bond to the hypnotist, and fear of negative appraisal by the hypnotist.

The Hungarian version is somewhat different from the original U.S. questionnaire. First, repeated factor analyses (Bányai, Varga, & Gösi-Greguss, 2001; Költő, 2015) suggested that the structure of the Hungarian version is not the same as that of the original one. In the Hungarian AIM, three factors emerged: *Admiration and bonding* reflects the feeling of being attached to the hypnotist in a special and positive way, as to earlier (positive) authority figures in the subject's life. *Fear of negative appraisal* reflects the need to avoid the hypnotist's anger and the subject's desire to please the hypnotist. *Need for dependence* reflects the subject's wish for the hypnotist to lead and protect the subject. The whole scale (*positive archaic involvement*) can be used as an overall measure of positive transference.

The second difference between the Hungarian AIM and the original is that the Hungarian contains three additional items that measure negative transference (*negative archaic involvement*).

### *Data Analysis*

First, we calculated mean scores, standard deviations, and reliability indices for the measures, in sample and gender breakdown. (For the PCI scales, Cronbach-alpha values were not calculated due to its way of dimensionality reduction.) We checked whether the variables were normally distributed. According to Kolmogorov-Smirnov tests of normality, with the exceptions of PCI dissociative control, PCI visual imagery, and PCI attention to internal processes,  $K-S(241) \leq .057$ ,  $p \geq .054$ , the assumption of normality was not met. Therefore, in line with the suggestion of Larson-Hall (2016), we applied bootstrap for subsequent correlational analyses, with 1,000 resampling for all tests.<sup>3</sup> Bias-corrected and accelerated 95% confidence intervals (Efron, 1987) were

calculated for all statistical tests. Since bootstrapping reduces the probability of Type I error (Wilcox, 2011), no corrections were applied to the significance levels in multiple statistical tests. Correlation matrices were constructed separately for the two samples and genders. Then we built multiple regression models, using parental variables as predictors and measures of hypnotic response as outcome variables. Stepwise method was used to parse out which parental variables have significant influence on hypnotic response. In the regression models, no bootstrap was applied, as stepwise modeling is iterative itself; therefore bootstrapping would be unfeasible in this case (Chernick, 2008). All analyses (except for the *a priori* power analysis) were carried out in SPSS 22.0. Significance levels were set at  $p < .05$ , two-tailed.

## RESULTS

Mean scores, standard deviations, and reliability indices are displayed separately for genders within the separate samples in Table 1.

Few significant gender differences were found: in recalled paternal emotional warmth in Sample 1, and in recalled maternal rejection and PCI negative affect in Sample 2, with females achieving higher scores. Cronbach-alpha measures were found to be sufficient, except for measures of behavioral hypnotizability and AIM negative scores. Reliability indices of the behavioral hypnotizability scales, however, were in line with previous findings, as those obtained by Carvalho, Kirsch, Mazzoni, and Leal (2008) (WSGC), or Költő and colleagues (2015; HGSHS:A). The somewhat low Cronbach-alpha values for AIM negative scores might be attributable to the low number of items included in the scale.

Because the z-transformed PCI scales are not simply summed from the original factors, we cannot directly assess their internal consistency. Pekala (1991) developed a reliability scale based on five corresponding items. He recommended excluding data of subjects whose reliability index is larger than 2. This constraint resulted in excluding five subjects from Sample 1. Therefore, the final Sample 1 consisted of 191 subjects. In Sample 2, five subjects also obtained more than 2 on the PCI reliability index and were excluded from further analysis. Hence, Sample 2 consisted of 241 subjects.

<sup>3</sup>Because bootstrap uses listwise deletion, the sample sizes in the correlational matrix are lower than the total number.

Table 1  
*Mean Scores, Standard Deviations and Reliability Indices in Sample 1 and Sample 2, in Gender Breakdown.*

Scale	Sample 1, males (n = 65)		Sample 1, females (n = 126)		Sample 2, males (n = 109)		Sample 2, females (n = 132)	
	M (SD)	Alpha	M (SD)	Alpha	M (SD)	Alpha	M (SD)	Alpha
<b>Parental rearing style</b>								
Paternal rejection	10.94 (3.48)	.776	10.30 (3.49)	.800	9.82 (3.19)	.788	10.00 (3.89)	.864
Maternal rejection	11.34 (3.54)	.741	10.86 (3.78)	.830	9.43 (2.72)*	.751	10.47 (3.72)*	.807
Paternal emotional warmth	14.48 (4.22)*	.844	16.27 (4.85)*	.896	14.93 (4.81)	.873	16.24 (5.12)	.886
Maternal emotional warmth	17.43 (4.27)	.846	18.83 (4.11)	.870	17.98 (4.07)	.848	18.52 (4.63)	.882
Paternal overprotection	18.03 (4.74)	.758	17.27 (4.92)	.804	16.85 (4.28)	.741	17.29 (5.02)	.810
Maternal overprotection	22.45 (5.28)	.767	21.13 (5.34)	.795	20.06 (5.13)	.803	20.30 (5.98)	.848
Paternal punishment	12.83 (3.53)	.722	12.15 (3.84)	.807	11.73 (3.50)	.787	11.67 (4.02)	.828
Maternal punishment	14.20 (3.50)	.661	13.27 (4.18)	.821	11.99 (3.37)	.779	12.72 (4.36)	.837
<b>Behavioral hypnotizability</b>								
WGGC self-score	4.48 (2.57)	.671	4.26 (2.34)	.629				
HGSHS:A self-score					5.84 (2.89)	.734	5.93 (2.64)	.662
<b>Phenomenology of hypnosis</b>								
Dissociative control	.48 (3.56)	n/a	-.30 (3.52)	n/a	-.35 (3.54)	n/a	-.54 (3.39)	n/a
Positive affect	.24 (2.17)	n/a	-.17 (2.23)	n/a	-.99 (2.24)	n/a	-.23 (2.07)	n/a
Negative affect	-.32 (1.45)	n/a	.10 (1.85)	n/a	-.36 (1.20)*	n/a	.28 (1.80)*	n/a
Visual imagery	-.14 (1.29)	n/a	.09 (1.42)	n/a	-.15 (1.19)	n/a	-.37 (1.28)	n/a
Attention to internal processes	.14 (1.28)	n/a	-.06 (1.43)	n/a	-.23 (1.41)	n/a	.01 (1.32)	n/a

(Continued)

Table 1  
(Continued)

Scale	Sample 1, males ( <i>n</i> = 65)		Sample 1, females ( <i>n</i> = 126)		Sample 2, males ( <i>n</i> = 109)		Sample 2, females ( <i>n</i> = 132)	
	M (SD)	Alpha	M (SD)	Alpha	M (SD)	Alpha	M (SD)	Alpha
<b>Archaic involvement</b>								
Positive archaic involvement	52.15 (21.62)	.926	50.44 (24.42)	.949	56.71 (20.67)	.915	58.04 (22.41)	.926
Negative archaic involvement	4.92 (2.77)	.520	4.77 (2.69)	.616	5.81 (3.14)	.667	6.04 (3.41)	.652
Admiration and bonding	2.83 (1.36)	.926	2.74 (1.46)	.938	3.04 (1.32)	.922	3.14 (1.46)	.933
Fear of negative appraisal	2.52 (1.39)	.884	2.31 (1.29)	.897	2.61 (1.37)	.881	2.54 (1.32)	.881
Need for dependence	3.00 (1.44)	.771	3.04 (1.70)	.872	3.43 (1.41)	.758	3.63 (1.58)	.839

Note: Asterisk at the given means indicate that in the given sample, bootstrapped *t*-tests revealed a significant ( $p < .05$ ) gender difference. HGSHS: A = Harvard Group Scale of Hypnotic Susceptibility, Form A; WSGC = Waterloo-Stanford Group C Scale of Hypnotic Susceptibility.

**Table 2**  
*Bootstrapped Correlations Between Factors of Recalled Parental Rearing Style and Dimensions of Hypnotic Response in Sample 1, Males (N = 57).*

	WSGC self-score	Dissociative control	Positive affect	Negative affect	Visual imagery	Attention to internal processes	Positive archaic involvement	Negative archaic involvement	Admiration and bonding	Fear of negative appraisal	Need for dependence
Paternal rejection	.118 [-.119, .356]	.112 [-.131, .343]	.028 [-.239, .331]	.174 [-.134, .424]	-.073 [-.302, .203]	.097 [-.190, .374]	.216 [-.045, .470]	.002 [-.221, .240]	.222 [-.024, .460]	.147 [-.149, .440]	.155 [-.103, .425]
Maternal rejection	.179 [-.089, .447]	<b>.307*</b> [.041, .523]	.176 [-.085, .452]	<b>.264*</b> [-.065, .516]	.196 [-.044, .422]	<b>.291*</b> [.036, .500]	.238 [-.044, .486]	<b>.266*</b> [-.042, .517]	.240 [-.030, .489]	.171 [-.152, .432]	.166 [-.104, .405]
Paternal emotional warmth	-.103 [-.341, .132]	-.132 [-.337, .073]	-.104 [-.365, .155]	-.081 [-.291, .154]	-.103 [-.366, .162]	-.129 [-.332, .094]	-.065 [-.294, .161]	.064 [-.139, .245]	-.045 [-.244, .152]	-.051 [-.305, .203]	-.079 [-.304, .153]
Maternal emotional warmth	-.100 [-.378, .174]	<b>-.313*</b> [-.526, -.083]	-.139 [-.430, .147]	-.166 [-.442, .141]	-.162 [-.397, .093]	<b>-.291*</b> [-.516, -.047]	-.151 [-.377, .105]	-.164 [-.503, .150]	-.136 [-.374, .099]	-.155 [-.410, .136]	-.071 [-.288, .154]
Paternal overprotection	.150 [-.103, .394]	.032 [-.229, .314]	-.035 [-.275, .230]	-.013 [-.265, .243]	.030 [-.230, .278]	.123 [-.122, .364]	.172 [-.100, .443]	-.001 [-.205, .235]	.135 [-.110, .386]	.158 [-.105, .400]	.149 [-.119, .422]
Maternal overprotection	<b>.272*</b> [.001, .522]	.180 [-.115, .455]	.120 [-.134, .353]	.104 [-.138, .331]	.258 [.011, .479]	.237 [-.010, .453]	.177 [-.101, .449]	.179 [-.059, .389]	.128 [-.164, .406]	.142 [-.101, .400]	.204 [-.048, .463]
Paternal punishment	.186 [-.058, .452]	.087 [-.143, .357]	-.017 [-.276, .273]	.150 [-.155, .398]	-.046 [-.297, .249]	.114 [-.163, .408]	.247 [.001, .472]	-.041 [-.232, .211]	.235 [.024, .461]	.210 [-.067, .471]	.152 [-.141, .431]
Maternal punishment	<b>.285*</b> [.034, .495]	<b>.336*</b> [.074, .550]	.218 [-.063, .498]	<b>.265*</b> [-.012, .499]	<b>.298*</b> [.012, .533]	<b>.347**</b> [.119, .537]	<b>.277*</b> [.002, .518]	.252 [-.011, .488]	<b>.290*</b> [.020, .539]	.186 [-.116, .447]	.190 [-.091, .449]

Note: \* $p < .05$ , \*\* $p < .01$ . Values in square brackets indicate 95% bias-corrected and accelerated confidence intervals. Significant values are highlighted in bold. WSGC = Waterloo-Stanford Group C Scale of Hypnotic Susceptibility.



**Table 3**  
*Bootstrapped Correlations Between Factors of Recalled Parental Rearing Style and Dimensions of Hypnotic Response in Sample 1, Females (N = 114).*

	WSGC self- score	Dissociative control	Positive affect	Negative affect	Visual imagery	Attention to internal processes	Positive archaic involvement	Negative archaic involvement	Admiration and bonding	Fear of negative appraisal	Need for dependence
Paternal rejection	.062 [-.116, .242]	-.003 [-.174, .170]	.090 [-.110, .290]	.136 [-.036, .300]	.064 [-.145, .253]	.062 [-.147, .267]	.129 [-.064, .313]	.084 [-.118, .284]	.130 [-.069, .317]	.090 [-.076, .247]	.104 [-.100, .285]
Maternal rejection	-.088 [-.228, .079]	-.170 [-.327, .006]	-.026 [-.211, .175]	.084 [-.079, .263]	-.062 [-.254, .138]	-.103 [-.298, .116]	-.019 [-.221, .201]	.125 [-.055, .322]	-.059 [-.241, .140]	.066 [-.106, .257]	-.028 [-.239, .193]
Paternal emotional warmth	-.047 [-.225, .149]	.051 [-.171, .274]	.106 [-.097, .292]	<b>-.254**</b> [-.413, -.087]	.029 [-.183, .245]	-.031 [-.228, .165]	.029 [-.173, .243]	-.086 [-.279, .106]	.036 [-.166, .243]	-.013 [-.234, .186]	.048 [-.137, .260]
Maternal emotional warmth	-.017 [-.192, .165]	.089 [-.114, .277]	.085 [-.096, .249]	-.035 [-.230, .141]	.064 [-.142, .261]	.039 [-.156, .232]	-.006 [-.213, .189]	-.048 [-.268, .146]	-.008 [-.215, .184]	-.001 [-.184, .167]	-.003 [-.198, .178]
Paternal over- protection	-.111 [-.333, .123]	-.160 [-.331, .029]	-.038 [-.217, .139]	.093 [-.097, .265]	-.019 [-.209, .167]	-.172 [-.344, .000]	-.109 [-.300, .062]	-.013 [-.171, .130]	-.120 [-.301, .064]	-.057 [-.258, .116]	-.090 [-.297, .104]
Maternal protection	-.124 [-.320, .082]	-.174 [-.350, .017]	-.159 [-.325, .041]	.114 [-.101, .315]	-.069 [-.253, .116]	-.141 [-.308, .043]	-.169 [-.372, .035]	.018 [-.153, .188]	<b>-.222*</b> [-.406, -.027]	-.011 [-.232, .204]	-.158 [-.349, .032]
Paternal punishment	.028 [-.167, .224]	-.052 [-.229, .137]	.085 [-.144, .301]	<b>.226*</b> [.069, .377]	.060 [-.149, .249]	-.014 [-.206, .174]	.108 [-.094, .299]	.055 [-.153, .248]	.101 [-.106, .295]	.085 [-.089, .243]	.094 [-.124, .289]
Maternal punishment	-.120 [-.273, .032]	-.136 [-.297, .051]	-.054 [-.241, .139]	<b>.229*</b> [.047, .411]	-.070 [-.258, .120]	-.111 [-.294, .098]	-.054 [-.242, .146]	.077 [-.115, .284]	-.100 [-.277, .071]	.071 [-.109, .267]	-.078 [-.279, .126]

Note: \* $p < .05$ , \*\* $p < .01$ . Values in square brackets indicate 95% bias-corrected and accelerated confidence intervals. Significant values are highlighted in bold. WSGC = Waterloo-Stanford Group C Scale of Hypnotic Susceptibility.

*Correlations of Parental Measures and Hypnotic Response in Sample 1*

Tables 2 and 3 show the correlations between parental behavior and dimensions of hypnotic response in male and female participants in Sample 1, respectively.

If we compare the two tables, there is apparently higher density of significant associations in males than in females. A small-to-medium correlation between maternal punishment and negative affect experienced in hypnosis was found in both men and women; the effect has a similar magnitude in both genders. Apart from this association, no other overlapping pattern was found across genders.

In men, maternal punishment is associated with many aspects of hypnotic response, showing small-to-medium correlations with the behavioral hypnotizability score, dissociative experiences, an increased visual imagery activity, elevated attention to internal processes, and positive transference toward the hypnotist. Frequently punished men also tended to show more admiration to and bonding with the hypnotist. In a similar magnitude, maternal rejection also showed associations with these variables, but instead of positive transference, it was correlated with negative archaic involvement. A higher level of recalled maternal warmth was associated with a lower level of dissociation and inward attention under hypnosis. Finally, maternal overprotection showed a small-to-medium correlation with WSGC scores: To a certain extent, the more overprotective a mother was in a male's recollection, the higher his behavioral hypnotizability score was.

In women, paternal warmth showed a small-to-medium negative association with negative affect under hypnosis, whereas both the father's and the mother's punishing behavior was associated with negative affect. Maternal overprotection, to a small extent, was associated negatively with admiration of and bonding with the hypnotist.

*Correlations of Parental Measures and Hypnotic Response in Sample 2*

Associations between recalled parental rearing style and hypnotic response in Sample 2 are displayed in Tables 4 and 5 for male and female subsamples, respectively.

As in Sample 1, there was a small overlap between men's and women's subsamples. However, in both genders, a small-to-medium association between paternal punishment and negative experiences under hypnosis was found. The fathers' dismissive and overprotective behavior showed small-to-medium associations with the need for dependence on the hypnotist. In other words, children of punishing fathers seemed to have more negative experiences under hypnosis, whereas paternal dismissal and overprotection were both linked with

**Table 4**  
*Bootstrapped Correlations Between Factors of Recalled Parental Rearing Style and Dimensions of Hypnotic Response in Sample 2, Males (N = 103).*

	HGSHS:A self-score	Dissociative control	Positive affect	Negative affect	Visual imagery	Attention to internal processes	Positive archaic involvement	Negative archaic involvement	Admiration and bonding	Fear of negative appraisal	Need for dependence
Paternal rejection	.080 [-.128, .276]	.166 [-.041, .358]	.018 [-.160, .191]	.171 [.005, .354]	.032 [-.171, .234]	.047 [-.158, .249]	<b>.275**</b> [.029, .485]	<b>.209*</b> [.016, .417]	.145 [-.074, .343]	<b>.330**</b> [.123, .516]	<b>.220*</b> [-.017, .416]
Maternal rejection	-.070 [-.240, .120]	.058 [-.129, .225]	-.031 [-.220, .168]	.152 [-.058, .350]	-.165 [-.350, .051]	.075 [-.153, .322]	.161 [-.083, .382]	<b>.387**</b> [.102, .649]	-.041 [-.249, .164]	<b>.370**</b> [.135, .554]	.132 [-.099, .355]
Paternal emotional warmth	.022 [-.178, .217]	.063 [-.122, .267]	.111 [-.078, .309]	-.003 [-.166, .156]	.108 [-.078, .300]	.102 [-.080, .276]	-.110 [-.291, .097]	-.006 [-.168, .147]	-.044 [-.220, .151]	-.168 [-.340, .027]	-.065 [-.264, .114]
Maternal emotional warmth	-.047 [-.227, .153]	.074 [-.117, .270]	.093 [-.113, .283]	-.048 [-.229, .142]	.098 [-.081, .282]	.190 [.019, .376]	-.062 [-.246, .119]	-.162 [-.336, .030]	-.007 [-.201, .200]	-.147 [-.323, .039]	.004 [-.174, .188]
Paternal overprotection	-.037 [-.216, .162]	-.021 [-.236, .200]	-.014 [-.191, .162]	.108 [-.077, .302]	-.078 [-.328, .098]	.079 [-.149, .293]	<b>.209*</b> [.034, .400]	<b>.207*</b> [-.081, .423]	.052 [-.114, .240]	<b>.278**</b> [.043, .488]	<b>.250*</b> [.046, .434]
Maternal overprotection	-.151 [-.333, .039]	.050 [-.152, .254]	-.019 [-.195, .141]	-.015 [-.235, .141]	-.167 [-.319, .000]	.182 [-.045, .407]	.105 [-.103, .316]	.150 [-.105, .379]	-.086 [-.249, .090]	<b>.287**</b> [.042, .510]	.148 [-.053, .346]
Paternal punishment	.035 [-.168, .245]	.124 [-.067, .302]	.022 [-.163, .200]	<b>.200*</b> [.033, .377]	-.049 [-.243, .150]	.056 [-.150, .269]	<b>.288**</b> [.057, .484]	<b>.240*</b> [.005, .459]	.110 [-.101, .299]	<b>.402**</b> [.213, .560]	<b>.235*</b> [.018, .417]
Maternal punishment	-.083 [-.251, .100]	.053 [-.123, .216]	-.049 [-.215, .118]	.170 [-.027, .361]	<b>-.219*</b> [-.389, -.045]	.120 [-.123, .358]	<b>.194*</b> [-.043, .412]	<b>.379**</b> [.119, .614]	-.053 [-.239, .144]	<b>.432**</b> [.201, .594]	.191 [-.016, .388]

Note: \* $p < .05$  \*\* $p < .01$ . Values in square brackets indicate 95% bias-corrected and accelerated confidence intervals. Significant values are highlighted in bold. HGSHS:A = Harvard Group Scale of Hypnotic Susceptibility, Form A.

Table 5  
*Bootstrapped Correlations Between Factors of Recalled Parental Rearing Style and Dimensions of Hypnotic Response in Sample 2, Females (N = 121).*

	HGSHS-A self-score	Dissociative control	Positive affect	Negative affect	Visual imagery	Attention to internal processes	Positive archaic involvement	Negative archaic involvement	Admiration and bonding	Fear of negative appraisal	Need for dependence
Paternal rejection	<b>.186*</b> [-.006, .355]	.045 [-.097, .199]	.033 [-.144, .212]	.141 [-.041, .325]	-.051 [-.213, .129]	.064 [-.080, .225]	.143 [-.057, .353]	-.023 [-.184, .146]	.109 [-.072, .296]	.080 [-.069, .272]	<b>.180*</b> [-.030, .393]
Maternal rejection	.088 [-.089, .265]	.117 [-.037, .263]	.048 [-.131, .232]	<b>.184*</b> [.024, .337]	-.014 [-.179, .169]	.090 [-.082, .264]	.129 [-.079, .302]	-.002 [-.165, .176]	.124 [-.066, .301]	.069 [-.106, .263]	.114 [-.093, .308]
Paternal emotional warmth	<b>-.213*</b> [-.380, -.025]	-.044 [-.229, .168]	<b>-.238**</b> [-.411, -.038]	-.103 [-.275, .068]	-.086 [-.272, .101]	-.125 [-.290, .073]	-.072 [-.259, .119]	.063 [-.123, .254]	-.102 [-.279, .098]	-.023 [-.195, .142]	-.016 [-.200, .168]
Maternal emotional warmth	-.125 [-.309, .051]	-.082 [-.256, .090]	-.124 [-.308, .076]	-.177 [-.343, -.021]	-.070 [-.288, .150]	-.066 [-.245, .121]	-.055 [-.236, .131]	-.016 [-.239, .204]	-.076 [-.238, .095]	-.020 [-.227, .187]	-.015 [-.194, .157]
Paternal overprotection	.048 [-.147, .243]	.086 [-.099, .275]	-.157 [-.338, .052]	.084 [-.075, .246]	-.059 [-.238, .108]	.077 [-.103, .257]	.140 [-.044, .333]	.070 [-.103, .238]	.069 [-.119, .283]	.133 [-.045, .312]	<b>.185*</b> [.009, .362]
Maternal overprotection	.083 [-.081, .259]	.156 [-.027, .327]	-.020 [-.186, .127]	.170 [-.063, .375]	<b>.212*</b> [.057, .366]	.174 [-.003, .337]	<b>.183*</b> [-.002, .368]	.009 [-.170, .196]	.158 [.001, .323]	.130 [-.076, .314]	.161 [-.018, .334]
Paternal punishment	<b>.187*</b> [.006, .354]	.070 [-.087, .250]	-.025 [-.192, .151]	<b>.190*</b> [.005, .367]	-.084 [-.232, .099]	.082 [-.095, .256]	.142 [-.040, .340]	.020 [-.145, .187]	.107 [-.064, .300]	.086 [-.067, .270]	.171 [-.030, .372]
Maternal punishment	.094 [-.061, .270]	.134 [-.026, .298]	.052 [-.110, .223]	<b>.231*</b> [.038, .402]	.064 [-.090, .237]	.133 [-.038, .288]	.152 [-.067, .344]	.052 [-.124, .227]	.136 [-.055, .323]	.126 [-.064, .322]	.103 [-.102, .314]

Note: \* $p < .05$ , \*\* $p < .01$ . Values in square brackets indicate 95% bias-corrected and accelerated confidence intervals. Significant values are highlighted in bold. HGSHS-A = Harvard Group Scale of Hypnotic Susceptibility, Form A.

the children expressing a greater need to be led and directed by the hypnotist.

In men, mainly the relational dimension of hypnosis was related to memories of parental behavior. Paternal rejection was associated with both positive and negative aspects of archaic involvement, to a similar magnitude. Maternal rejection was also associated with negative feelings toward the hypnotist, and a fear of negative appraisal of the hypnotist, at a medium level. Paternal overprotection and punishment and maternal punishment also showed medium levels of correlations with both positive and negative aspects of archaic involvement with the hypnotist. Parents' punishing behavior and the boys' fear that the hypnotist would be displeased with their hypnotic performance showed the highest levels of correlations in the study ( $r = .402$  for fathers and  $r = .432$  for mothers). Finally, a small-to-medium negative correlation was found between the intensity of visual imagery under hypnosis and the recalled punishing behavior of the mothers.

Associations in the female subsample concentrated around behavioral and phenomenological hypnotic response rather than around the relational dimension. Apart from the already mentioned associations with the need for dependence (which showed a similar pattern across genders), just a small-to-medium association was found between maternal overprotection and positive transference toward the hypnotist. However, memories of the fathers' behavior was associated with female participants' HGSHS:A scores. To a small-to-medium level, the more dismissive and punishing—and less warm—the father was, the higher hypnotizability the daughter showed. A small-to-medium association was found with the mothers' dismissive and punishing behavior and negative affects the women experienced under hypnosis. A reverse correlation was found between the fathers' warmth and the positive affective quality of hypnosis.

#### *Multiple Regression Models in Sample 1*

How measures of recalled parental behavior determine dimensions of hypnotic response are displayed in [Tables 6](#) and [7](#), separately for males and females.

In the case of male participants, punishment in general seems to be predictive of most dimensions of hypnotic response. However, in most cases, it only explains a relatively low (under 10%) variation of hypnotic behavior, phenomenology, and relationship. Maternal punishment explains a significant proportion of the variation in the males' dissociative (7.9%) and positive experiences (6.1%), their increased visual activity (6.2%), attention to internal processes (10.5%), and positive transference—and admiration of and bonding with (4.3%, and 4.6%, respectively)—toward the hypnotist. Higher levels of maternal overprotection contributed to higher hypnotizability scores

Table 6  
 Multiple Regression Models: Effect of Recalled Parental Rearing Style on Dimensions of Hypnotic Response in Sample 1, Males (N = 69).

Dependent variable Predictor variable(s)	B	95% CI (B)	$\beta$	Adjusted R <sup>2</sup>	F (df)	sig.
<b>WSGC self-score</b>						
Maternal overprotection	.128	[.013, .242]	.261	.054	4.914 (1, 67)	.03
<b>Dissociative control</b>						
Maternal punishment	.307	[.072, .542]	.304	.079	6.808 (1, 67)	.011
<b>Positive affect</b>						
Maternal punishment	.170	[.024, .317]	.274	.061	5.419 (1, 67)	.023
<b>Negative affect</b>						
Maternal rejection	.105	[.005, .206]	.247	.047	4.348 (1, 67)	.041
<b>Visual imagery</b>						
Maternal punishment	.102	[.015, .189]	.276	.062	5.523 (1, 67)	.022
<b>Attention to internal processes</b>						
Maternal punishment	.126	[.042, .209]	.343	.105	8.950 (1, 67)	.004
<b>Positive archaic involvement</b>						
Maternal punishment	1.479	[.017, 2.490]	.239	.043	4.077 (1, 67)	.047
<b>Negative archaic involvement</b>						
Maternal rejection	.193	[.001, .386]	.243	.044	4.010 (1, 64)	.049
<b>Admiration and bonding</b>						
Maternal punishment	.095	[.001, .188]	.248	.046	4.113 (1, 63)	.047
<b>Fear of negative appraisal</b>	—					
<b>Need for dependence</b>	—					

Note: Em dashes (—) indicate that no predictor variables were entered into the regression model. WSGC = Waterloo-Stanford Group C Scale of Hypnotic Susceptibility.

**Table 7**  
*Multiple Regression Models: Effect of Recalled Parental Rearing Style on Dimensions of Hypnotic Response in Sample 1, Females (N = 127).*

<b>Dependent variable</b>	<b>B</b>	<b>95% CI (B)</b>	<b><math>\beta</math></b>	<b>Adjusted <math>R^2</math></b>	<b>F (df)</b>	<b>sig.</b>
<b>Predictor variable(s)</b>						
<b>WSGC self-score</b>	—					
<b>Dissociative control</b>	—					
<b>Positive affect</b>	—					
<b>Negative affect</b>						
Paternal emotional warmth	-.148	[-.232, -.064]	-.381			
Maternal emotional warmth	.123	[.012, .233]	.268			
Maternal punishment	.364	[.186, .542]	.807			
Maternal rejection	-.332	[-.539, -.124]	-.666			
Final model				.193	8.557 (4, 122)	< .001
<b>Visual imagery</b>	—					
<b>Attention to internal processes</b>	—					
<b>Positive archaic involvement</b>	—					
<b>Negative archaic involvement</b>	—					
<b>Admiration and bonding</b>						
Maternal overprotection	-.051	[-.232, -.064]	-.188			
<b>Fear of negative appraisal</b>	—					
<b>Need for dependence</b>	—					
				.027	4.496 (1, 123)	.036

*Note.* Em dashes (—) indicate that no predictor variables were entered into the regression model. WSGC = Waterloo-Stanford Group C Scale of Hypnotic Susceptibility.

(explained proportion: 5.4%), whereas maternal rejection explained 4.7% of the variation in male participants' negative affect under hypnosis and 4.4% of their negative emotions toward the hypnotist.

Patterns of regression across genders do not seem to overlap, with the notable exception of PCI negative affect, which is partly determined by a higher level of maternal rejection in males (to 4.7%), and by a combination of lower level of paternal emotional warmth, higher level of maternal emotional warmth and maternal punishment, and lower level of maternal rejection (to 19.3%) in females. Lower recalled overprotective behavior of the mother explained 2.7% variance in females' admiration of and bonding with the hypnotist.

#### *Multiple Regression Models in Sample 2*

Tables 8 and 9 show the influence of recalled parental behavior on hypnotic response for male and female subsamples, respectively.

If you compare these results with those in Tables 6 and 7, you find no overlaps between the subgroups tested with WSGC and HGSHS:A. In males, parents' punishing behavior seems to have an influence on negative affect, visual imagery, and positive and negative aspects of transference toward the hypnotist. The explained proportions are relatively low (under 10%), except for negative transference and fear of the hypnotist's negative appraisal. Variance in the former is explained by maternal punishment to 17.7%. Maternal and paternal punishment have separate explanative power on fear of negative appraisal, which in combination explain 21.9% in its variance.

Apart from need for dependence, which is to a small extent explained by paternal overprotection (4.9% in men and 3.1% in women), there was no overlap between genders. In females, lower level of paternal emotional warmth contributed to HGSHS:A scores (3.4%) and positive affect in hypnosis (5.4%).

## DISCUSSION

To our knowledge, this is the first study exploring quantitative associations between parental rearing style and different aspects of hypnotic response. Our results suggest that parental behavior, to a certain extent, is associated with adult hypnotic behavior, experiences, and emotional bond with the hypnotist.

We hypothesized that a small-to-medium correlation between dimensions of parental rearing style and hypnotizability scores would be found. For the behavioral dimension of hypnotic response, these associations were rather sparse. However, in Sample 1, significant correlations were found between males' WSGC scores and maternal overprotection and punishment (around  $r = .30$ ). In Sample 2, females' HGSHS:A scores were associated with lower levels of



**Table 8**  
*Multiple Regression Models: Effect of Recalled Parental Rearing Style on Dimensions of Hypnotic Response in Sample 2, Males (N = 105).*

<b>Dependent variable</b> Predictor variable(s)	<i>B</i>	95% CI ( <i>B</i> )	$\beta$	Adjusted $R^2$	<i>F</i> (df)	sig.
<b>HGSHS:A self-score</b>	—					
<b>Dissociative control</b>	—					
<b>Positive affect</b>	—					
<b>Negative affect</b>						
Paternal punishment	.085	[.013, .157]	.225	.042	5.517	.021
<b>Visual imagery</b>						
Maternal punishment	-.073	[-.138, -.008]	-.215	.037	5.008	.027
<b>Attention to internal processes</b>	—					
<b>Positive archaic involvement</b>						
Paternal punishment	1.684	[.607, 2.761]	.292	.076	9.614	.002
<b>Negative archaic involvement</b>						
Maternal punishment	.423	[.249, .596]	.430	.177	23.359	< .001
<b>Admiration and bonding</b>	—					
<b>Fear of negative appraisal</b>						
Maternal punishment	.120	[.038, .202]	.305			
Paternal punishment	.092	[.011, .174]	.239			
<b>Final model</b>				.219	15.574	< .001
<b>Need for dependence</b>						
Paternal overprotection	.075	[.016, .035]	.242	.049	6.382	.013

*Note.* Em dashes (—) indicate that no predictor variables were entered into the regression model. HGSHS:A = Harvard Group Scale of Hypnotic Susceptibility, Form A.

Table 9  
*Multiple Regression Models: Effect of Recalled Parental Rearing Style on Dimensions of Hypnotic Response in Sample 1, Females (N = 124).*

Dependent variable Predictor variable(s)	B	95% CI (B)	$\beta$	Adjusted R <sup>2</sup>	F (df)	sig.
<b>HGSHS:A self-score</b>						
Paternal emotional warmth	-.107	[-.198, -.016]	-.206	.034	5.388	.022
<b>Dissociative control</b>						
<b>Positive affect</b>						
Paternal emotional warmth	-.099	[-.168, -.030]	-.248	.054	8.021	.005
<b>Negative affect</b>						
Maternal punishment	.087	[.017, .157]	.218	.040	6.080	.015
<b>Visual imagery</b>						
Maternal overprotection	.074	[.030, .117]				
Paternal overprotection	-.066	[-.119, -.014]	.348			
Final model			-.260	.074	5.913	.004
<b>Attention to internal processes</b>						
Maternal overprotection	.038	[.001, .076]	.177	.023	3.955	.049
<b>Positive archaic involvement</b>						
Maternal overprotection	.062	[.012, 1.313]	.179	.024	4.059	.046
<b>Negative archaic involvement</b>						
<b>Admiration and bonding</b>						
<b>Fear of negative appraisal</b>						
<b>Need for dependence</b>						
Paternal overprotection	.063	[.007, .119]	.198	.031	4.960	.028

*Note.* Em dashes (—) indicate that no predictor variables were entered into the regression model. HGSHS:A = Harvard Group Scale of Hypnotic Susceptibility, Form A.

paternal emotional warmth and more paternal punishment (around  $r = .20$ ). These findings indicate that our first hypothesis is not fully confirmed; however, the pattern of associations is in line with findings of Hilgard (1979). The gender pattern of the results—that is, that the opposite-gender parent's behavior had a greater effect on the subjects' hypnotizability than that of the same-gender parent—are also in parallel with Hilgard's conclusions.

What may be the reason for the different correlational patterns across the two samples? First, the test suggestions of WSGC (e.g., dream, positive and negative hallucination, age regression) require higher cognitive and affective activity than those of HGSHS:A (which mostly tap into motor phenomena). A second possible explanation is that subjects in Sample 1 were somewhat younger (mean age was 24 years) than those in Sample 2 (with a mean age of 28 years). Although the four years of age difference does not seem high, it should be considered that the two groups' recalling of their parents might have been different, due to maturity and maybe better understanding parenting. Third, the context effect—potentially emerging because the EMBU is administered before or after the hypnotizability assessment—may also contribute to the different patterns across the two samples (Council, 1993). Our findings are limited by the fact that administration order and type of hypnotizability scale is confounded. Future studies are needed to parse out potential context effect with systematically comparing associations if hypnotizability testing precedes or follows assessment of memories on parental behavior.

Maternal overprotection explains 5.4% of the variation in hypnotizability of men (as assessed with WSGC), and low paternal warmth explains 3.4% in the variability of HGSHS:A scores of women. This again gives partial support to our hypothesis that parental behavior predicts a small but significant portion of adult hypnotic susceptibility besides other factors, such as fantasy proneness (Lynn & Rhue, 1988), genetic components, attentional abilities, and temperament (Lichtenberg et al., 2004). Future comprehensive studies on the determinants of hypnotic responsiveness should involve measures of parental rearing style.

These results also give partial support to our hypothesis that in the context of parental behavior, group hypnotizability testing may be used instead of individual sessions, which require far more resources. Although comparisons of individual and group hypnotizability testing are functionally equivalent and yield similar results (Bentler & Hilgard, 1963), individual hypnosis sessions may have more resemblance to the one-to-one relationship of the child and parent. We

speculate that measuring hypnotic response in individual sessions would have resulted in stronger associations.

Finally, we expected that not just the behavioral dimension but the emotional and phenomenological aspects of hypnotic response would be associated with parental rearing style. In these dimensions, both correlations and regressions were stronger than in the behavioral one. We hypothesized that a warm-supportive parental style would be associated with more positive feelings (toward the hypnotist and in the hypnotic state), whereas cold-punishing parental behavior would be correlated to negative feelings about the hypnotist and about hypnosis itself. The associations, as measured by patterns of correlations and regression analyses, were different across hypnotizability measures and across genders. However, in general, negative parental behavior—punishment and overprotection—was associated with phenomenological and emotional dimensions of hypnotic response to a small extent. One consistent pattern in females was that maternal punishment predicted negative affect in hypnosis in both samples. In men, punishing parental behavior predicted various positive and negative responses to hypnosis. These associations support one of the developmental “pathways” suggested by Hilgard (1979): Cold and restrictive (punishing or overprotecting) parental behavior may lead to higher adult hypnotizability.

A somewhat controversial finding is that parental punishment correlated with both positive and negative facets of archaic involvement. In our opinion, it might be attributed to the fact that the hypnotist may be unconsciously perceived as a “good” parent, who will not judge or punish the subject. This corrective momentum may be one of the key factors in the success of hypnotherapy (Brown & Fromm, 1986). The fact that negative dimensions of parental attachment—punishment, overprotection, and low level of emotional warmth—were associated with hypnotic response underpins the “problematic” aspect of hypnotizability (Peter, Hagl, Bazijan, & Piesbergen, 2011).

There are some limitations of the present study. First, the confounding administration order and type of hypnotizability scales discussed above prevented separation of the effect of these two factors.

Second, the data collection (especially in Sample 1) happened a relatively long time ago. Hypnotizability scores show a general increase over time (Benham, Smith, & Nash, 2002; Költö et al., 2014), and the 8 years since data for Sample 1 were collected can make a difference. The number of adolescents who report their parents being supportive also shows an increase in many countries during an 8-year period, although no remarkable trend was observed in Hungary (Brooks et al., 2015).

Third, actual parental behavior was not assessed, only the subjects' recollection of it. Developmental pathways of hypnosis might have been fully understood if a large number of subjects had been followed in a longitudinal study that assessed hypnotizability in the participants' adulthood. Moreover, the influence of attachment and family socialization may be overwritten by other factors in adult life, and therefore they may play a lesser role in adult functioning than in children's lives. The emotional valence or even the factual content of memories regarding our parents may change over time. The socio-emotional selectivity theory suggests that as people grow older, their memories are gradually altered to be more positive (Mather & Carstensen, 2005). This may also have influenced our subjects' memories about their parents, although most of them were young adults.

The fourth limitation is that our subjects were volunteering for the hypnosis study without any remuneration. Based on the large literature on the volunteer effect (e.g., Rosenthal, 1966; Rosenthal & Rosnow, 1975/2009), we hypothesize that the recruitment process in our study preselected those people who volunteered for an intrinsic interest in hypnosis. Maybe frequently punished and emotionally neglected children will grow into adults who are more likely to be fearful and rejective of hypnosis, which might prevent them from participating in hypnosis or seeking hypnotherapy.

A mediating factor in this pathway may be *alexithymia*, the decreased ability to identify and verbalize someone's own emotions (Taylor, Bagby, & Parker, 1997). In a review article we identified factors that may link alexithymia and hypnotic response (Költő & Bányai, 2015). These include the ability to perceive and interpret someone's own and other persons' mental states (emotions, expectations, beliefs, and attitudes), psycho-endocrine and psychogenetic mechanisms, and dissociative capacity. An important endocrine pathway that may link these two phenomena (and attachment and parental rearing style) is oxytocin. Oxytocin is understood to have an essential role in social bonding, including mother–infant relationships (Weisman, Zagoory-Sharon, & Feldman, 2012). Administering external oxytocin to alexithymic subjects increases their mentalization skills (Luminet, Grynberg, Ruzette, & Mikolajczak, 2011). Hypnotizability also seems to be associated with mentalization, as hypnotic interaction can only occur if the subject and the hypnotist are able to read and understand each other's mental states (Költő, 2015). An analysis of psychoanalytic and neuroscientific literature also points to the link between the theory of mind and hypnotic involvement (Bonshtein, 2012). In the hypnotic interaction, the change of oxytocin level in subjects is associated with their hypnotizability and their perceived harmony with the hypnotist; in the hypnotist, a change in the oxytocin level is related to lower levels of recalled parental

warmth by the subject (Varga & Kekecs, 2014). These results are similar to those observed in infant–mother dyads and suggest that oxytocin is one of the neurobiological factors that integrate attachment and hypnosis (Zelinka, Cojan, & Desseilles, 2013).

Our initial analyses suggest that alexithymic affective processing mediates between parental punishment and fear in hypnosis (Költő, 2015). A future aim of our research team is to study the associations between recalled parental rearing style, alexithymia and other facets of mentalization, attitudes toward hypnosis, actual participation in research hypnosis, and hypnotic response in a comprehensive manner.

### *Implications for Clinical Practice*

Our findings suggest that hypnotherapists may benefit from systematically assessing their clients' memories of their parents before the hypnotherapeutic intervention, as these may influence how they will feel about hypnosis and the hypnotist. It remains a question as to what are the factors that facilitate or prevent potential clients seeking hypnotherapy. Individuals who recall strict, punishing, and/or emotionally unresponsive parents—even if hypnotherapy would provide corrective emotional experiences to them—may feel fearful about seeing a therapist and trying hypnosis. Even if they are seeking help, they might experience stress and anxiety in the hypnotic situation and find it difficult to identify and talk about their emotions. It can be beneficial for both the client and the hypnotherapist if a therapeutic alliance is established based on the sense of security and mutual trust.

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### Erinnerung elterlicher Erziehungsweisen und Dimensionen hypnotischer Antworten

ANDRÁS KÖLTŐ, EMESE JÓZSA, UND ÉVA I. BÁNYAI

**Abstract :** Bisher haben nur einige wenige Studien untersucht, wie das Gedächtnis über die Erziehungsweise der Eltern mit hypnotischer Antwort assoziiert ist. Und diese waren entweder qualitativ oder auf den behavioralen Aspekt der Hypnotisierbarkeit beschränkt ausgerichtet. Die aktuelle Studie zielt darauf ab, standardisierte, quantitative Messungen zu verwenden, um die Assoziationen zwischen dem erinnerten Erziehungsverhalten der Eltern und dem behavioralen, phänomenologischen und emotionalen Aspekten hypnotischer Antworten zu untersuchen. Zwei Stichproben gesunder erwachsener Probanden (N = 438) füllten einen Fragebogen zu dem Verhalten ihrer Eltern aus und nahmen an Standard-Gruppenhypnosesitzungen teil, in denen ihr Hypnotisierbarkeitslevel, die hypnotischen Erfahrungen und das archaische Grundprogramm erhoben wurden. Erinnerungen an kaltes und strafendes elterliches Verhalten waren mit negativen Erfahrungen bezüglich des hypnotischen Zustandes und bezüglich des Hypnotherapeuten verbunden. Die Autoren schließen daraus, daß es wichtig sein könnte, das Verhalten der Eltern der Klienten in die Planung hypnotherapeutischer Interventionen aufzunehmen.

STEPHANIE RIEGEL, M.D.

### Souvenirs du type d'éducation parentale et ampleur de la réponse hypnotique

ANDRÁS KÖLTŐ, EMESE JÓZSA ET ÉVA I. BÁNYAI

**Résumé:** Seules quelques études ont jusqu'à maintenant abordé le lien qui existe entre les souvenirs du type d'éducation parentale et la réponse hypnotique, et ces études étaient soit qualitatives, soit limitées à l'aspect comportemental de la sensibilité à l'hypnose. La présente étude emploie des mesures quantitatives normalisées pour examiner le lien qui existe entre le

souvenir du type d'éducation parentale et les aspects comportementaux, phénoménologiques et émotionnels de la susceptibilité hypnotique. Deux échantillons de sujets adultes en bonne santé ( $N = 438$ ) ont répondu à un questionnaire sur le comportement de leurs parents et ont participé à une séance d'hypnose de groupe standard évaluant leur score de sensibilité à l'hypnose, leurs expériences hypnotiques et leurs souvenirs d'enfance. Les souvenirs de comportements parentaux froids et répressifs ont été associés à des expériences négatives liées à l'état hypnotique et à des émotions négatives envers l'hypnotiseur. Les auteurs en concluent que l'évaluation du comportement parental des sujets peut être importante dans la planification des interventions hypnothérapeutiques.

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### Estilo parental de crianza recordado y las dimensiones de respuesta hipnótica

ANDRÁS KÖLTÓ, EMESE JÓZSA Y ÉVA I. BÁNYAI

Resumen: Hasta el momento ha habido pocos estudios que investiguen cómo los recuerdos del estilo parental de crianza se relacionan con la respuesta hipnótica, y lo que existen son cualitativos o están limitados al aspecto conductual de la hipnotizabilidad. El presente estudio pretende emplear medidas cuantitativas estandarizadas para investigar las asociaciones entre el estilo parental de crianza recordado y los aspectos conductual, fenomenológico y emocional de la respuesta hipnótica. Dos muestras de sujetos adultos sanos ( $n = 438$ ) completaron un cuestionario sobre el comportamiento de sus padres y participaron en una sesión grupal estándar de hipnosis en la que se evaluó su hipnotizabilidad, sus experiencias hipnóticas y su implicación arcaica. Los recuerdos de conductas parentales distantes y punitivas se asociaron con experiencias negativas relacionadas al estado hipnótico y a emociones negativas hacia el hipnotista. Los autores concluyen que la evaluación de comportamientos parentales podría ser importante en la planeación de intervenciones hipnoterapéuticas.

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