Field dependence, suggestibility and belief in paranormal phenomena

Andreas Hergovich

Institute of Psychology, University of Vienna, Liebigg. 5, 1010, Vienna, Austria

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Abstract

This paper examines the relationships between field dependence, suggestibility and belief in paranormal phenomena. In Experiment 1, 91 subjects underwent an hypnosis session to determine their suggestibility. They also completed a paranormal belief scale and a computer test of field dependence. It was shown that suggestibility and field dependence had positive and significant correlations with the belief in paranormal phenomena. In a second experiment ($n = 39$), the interrogative suggestibility of the subjects was assessed. Field dependence/independence was measured using the Embedded Figures Test (EFT) (Witkin, Oltman, Raskin, & Karp, 1971) and the degree of paranormal belief using the paranormal belief scale of Tobacyk and Milford (1983). The results confirmed the hypothesis that more field-dependent and suggestible subjects have a greater belief in paranormal phenomena than field-independent and non-suggestible subjects, although the relationship only held for the subscale “Superstition”. The findings with respect to field dependence as measured with the EFT were replicated in a third study ($n = 150$). Field dependence had a main effect on the amount of belief in “Superstition” across three different instructions. An effect of the different instructions suggesting that paranormal phenomena are scientifically proven (unproven) or an interaction between instructions and cognitive style of the subjects could not be found. In summary, the findings indicate a substantial relationship between suggestibility and field dependence with belief in paranormal phenomena which could be explained by different coping mechanisms with regard to uncertainty in the external world. © 2002 Elsevier Science Ltd. All rights reserved.

E-mail address: andreas.hergovich@univie.ac.at
In this paper we will examine the relationship between the cognitive style of field dependence/independence, suggestibility and the belief in paranormal phenomena. We expected such a relationship based on two considerations. First, from a phenomenological point of view the belief in the paranormal implies the belief in the existence of phenomena which currently cannot be explained by science, phenomena such as psi (extrasensory belief and psychokinesis), near-death experiences or the belief in alternative medical practices. The acceptance of these phenomena allows the believer to have a different world view (Zusne & Jones, 1989), a world view which shows the world as being more humane and having greater meaning. Such an animistic world does not obey mechanical scientific laws and is not reducible to materialism. Instead, it is holistic (everything is connected with everything else) and attributes greater significance to personal relationships and mental acts. This is not only the description of the world view of many believers in the paranormal, but also that of the perfect world of field dependents. Field dependents, according to Witkin (Witkin & Goodenough, 1981), do not have the same sense of separate identity as do field independents. They are dependent on external cues of reference and have a greater social orientation.

The second consideration suggests a relationship of suggestibility and field dependence with the belief in the paranormal. Thus, if one studies the history of parapsychology, at least some of the paranormal phenomena are results of deceptions. We know of deceptions of tricky mediums (from Eusapio Palladino to Uri Geller), and of deceptions in experimental research (the case of Soal or the Levy-affair, Markwick, 1985; Rhine, 1974, 1975). In all these cases of deception there were, from the beginning, believers (who explained that these phenomena were real) and sceptics. It is assumed that more suggestible persons and more field-dependent persons (who rely on external suppositions) were much more prone to accept these phenomena as real (to believe in them). Note that this argument could not explain the belief in paranormal phenomena which are not results of deception, such as the belief in some sort of paranormal cause if a coincidence occurs (Falk, 1981, 1989; for other determinants of belief in the paranormal, cf. Hergovich, 2001 or Irwin, 1993). Aside from these considerations, there does already exist some experimental support of a relationship between field dependence, suggestibility and belief in the paranormal, although no study has yet examined the relationship of both variables as predictors of the belief in paranormal phenomena. We will present this evidence in the next section.

1. Field dependence

A personality variable which may have a relationship to the belief in paranormal phenomena is field dependence/independence. According to the theory, field-dependent individuals are influenced in their perception by the surrounding field. Witkin postulated that the dimension of field dependence–independence is only part of a general cognitive style (Messick, 1994; Witkin, Dyk, Faterson, Goodenough, & Karp, 1962 for criticism of the construct of cognitive style, cf. Davis, 1991; McKenna, 1984). The broader construct, which included not only perceptual and intelligence tasks, but also areas such as neurophysiological separation, defense mechanisms and body concept, was subsumed under the term psychological differentiation. Field-independent individuals should perform better on tasks where cognitive functioning is tested, should have a more
articulated concept of their own body, and should be more differentiated on the neurophysiological level.

The relationship between field dependence and belief in paranormal phenomena was examined in two studies. Roney-Dougal (1987) conducted two studies (an exploratory and a follow-up study), in which a positive correlation between field dependence [as measured using the Embedded Figures Test (EFT) from Witkin, Oltman, Raskin, & Karp, 1971] and attitude toward psi were reported. These results were confirmed by Snel, Sijde and van der Wiegant (1995). Believers in psi (178 subjects were divided into three groups according to their scores on a sheep–goat-questionnaire) were more field dependent (again measured with the EFT) than non-believers (goats).

Apart from these results, there are some indirect indications of a relationship between field dependence and belief in paranormal phenomena. Thus, it was shown in a number of studies that belief in paranormal phenomena is associated with a relative bias for right-hemisphere processing. Murphy and Lester (1976) found that believers in paranormal phenomena rely on a style of thinking characteristic for right-hemisphere processing. Brugger and Baumann (1994), Roig and Neaman (1992) and Thalbourne (1984) reported similar results. Brugger, Gamma, Muri, Schäfer, and Taylor (1993) found a superiority of the left hemisphere in a lateralized tachistoscopic task in non-believers in paranormal phenomena. Believers did not exhibit hemispheric specialization. The lack of hemispheric asymmetry was due to an exceptionally high performance of believers in tasks which involved the right hemisphere.

Because it has been suggested that field dependence is also associated with hemispheric asymmetry (Berlin & Languis, 1981; Pizzamiglio & Carli, 1974; Waber, 1977; Witkin et al., 1971), this is cited as a further argument that there exists an association between field dependence and belief in paranormal phenomena.

2. Suggestibility

The term suggestibility is used for a wide range of constructs which refer to human susceptibility as hypnotic suggestibility, interrogative suggestibility, sensory suggestibility or reactions to authority (for a theoretical overview cf. Schumaker, 1991). Although the constructs have varying definitions, there is agreement that all these constructs imply some sort of uncritical and non-volitional acceptance of a proposition or course of action (Gudjonsson, 1987). In our study we were interested in three operationalizations of suggestibility: hypnotic suggestibility, interrogative suggestibility and the influence of instructions (as a measure of social suggestibility).

The relationships between the different constructs are a frequent topic of discussion (Gwynn & Spanos, 1996). For example, the relationship between hypnotic suggestibility and interrogative suggestibility is not yet clear. Arguments that the two constructs bear little resemblance to one another (Gudjonsson, 1987; Register & Kihlstrom, 1988) are challenged by others (Linton & Sheehan, 1994). The findings with respect to the relationship between hypnotizability and social susceptibility (operationalized as suggestibility, responses to the autokinetic effect or measures of conformity) point in a positive direction (Hayek & Spacek, 1987; Shames, 1981), although some results were inconsistent (for an overview see Gwynn & Spanos, 1996). One would expect a close relationship between interrogative suggestibility and social influence, because interrogative
suggestibility is basically a special case of social suggestibility which stresses social pressure. Consequently, positive correlations between the results of a suggestive interview and measures of interrogative suggestibility were found (Malinoski & Lynn, 1999).

For hypnotic suggestibility, Wagner and Ratzeburg (1987) reported positive correlations between hypnotic suggestibility (measured with the Harvard Scale of Hypnotic Susceptibility) and paranormal belief, the number of parapsychological experiences and attitudes toward parapsychology and supernatural powers. Because their sample was relatively large \( n = 208 \), the correlation coefficients were significant, although the size of the coefficients was rather small (between 0.20 and 0.26). Saucer, Cahoon, and Edmonds (1992) conducted an experiment in which 25 subjects were exposed to recorded hypnotic induction. Following the induction, the subjects were given two word lists, and received a suggestion for amnesia concerning the lists. A recall test proved that this post-hypnotic order was successful. The recall scores then served as a measure of the degree of hypnotic suggestibility. One week after the hypnotic induction, the subjects completed several questionnaires, including the Paranormal Belief Scale (PBS; Tobacyk & Milford, 1983). The results showed that hypnotic suggestibility, as measured by recall score, was not significantly related to paranormal belief. Thus, conclusive results for the influence of hypnotic suggestibility are still lacking.

Interrogative suggestibility can be regarded as the tendency of an individual’s account of events to be altered by misleading information and interpersonal pressure between interviews. In one study of Haraldson (1985), 79 subjects completed the Gudjonsson Suggestibility Scale (GSS; Gudjonsson, 1984) and the PBS (Tobacyk & Milford, 1983). The suggestibility scores correlated significantly with the subscales “Witchcraft”, “Spiritualism” and “Precognition” of the PBS (the coefficients were between 0.19 and 0.32).

There are also results which indicate a relationship between field dependence and suggestibility. Thus, Goldenberg and Wachtel (1973) showed that field dependents are more easily hypnotized than field-independent people. McFall and Schenkein (1970) demonstrated that field dependents are also more sensitive to the Rosenthal effect. The results of Chen-Shan (1984) point in the same direction. In this study, the performance of field dependents depended to a greater extent on the encouragement or discouragement of the experimenter. Manning (1991) also found that field-dependent subjects are liable to change their patterns of performance when influenced by field-independent subjects. In addition, there also exist some hints that interrogative suggestibility and field dependence are not independent of one another. Blagrove, Cole-Morgan, and Lambe (1994) as well as Singh and Gudjonsson (1992) reported significant correlations between interrogative suggestibility and field dependence (for an overview of the research, cf. Gudjonsson, in press).

3. Study 1

3.1. Method

3.1.1. Subjects

The examination was carried out on 91 subjects (volunteers). The age of the subjects was between 18 and 60 years (the mean value was 34.15 years with a standard deviation of 13.98). 39 persons (42.9%) were male, 52 (57.1%) were female.
3.2. Materials

The “Gestaltwahrnehmungstest” (Gestalt perception test—GWT) of Hergovich and Hörndler (1994), a computer test, was used to measure the degree of field dependence. This is a one-dimensional test based on the linear logistical Rasch model (Fischer & Molenaar, 1995), and measures the ability to act independently of a given context. The test resembles the EFT (Witkin et al., 1971) and correlates with it to a measure of 0.51 (Hergovich, 1999). The items consist of figures in which one has to find an embedded figure in the form of a little house and mark it using the mouse (Fig. 1). In our sample the reliability of the test was 0.82.

The Occultism scale (Böttinger, 1976) was presented in order to measure the belief in paranormal phenomena. This questionnaire assesses the belief in various paranormal phenomena (like precognition, astrology, the existence of flying saucers or the possibility of communicating with the dead) and consists of 16 statements which were answered by the subjects using a six-point Likert-type scale ranging from “does not apply at all” to “applies very well”. The reliability of the questionnaire (Cronbach’s alpha) of the preceding sample (n = 91) was 0.89.

To be able to measure the suggestibility of the subjects, hypnotic induction (according to Weitzenhofer, 1989) was recorded on tape and played for the subjects. The subjects lay on a couch and had the simple task of listening to the voice on a tape. During the hypnotic induction it was suggested to them that they were not able to open their eyes anymore. After they tried to open their eyes, the hypnosis session was finished and the subjects were led back to wakefulness. Following this procedure the subjects indicated on a six-point Likert-type scale how difficult it was for them to open their eyes during the hypnotic induction. In addition, the experimenter used a six-point scale to judge the depth of hypnosis (observing the difficulty subjects had in opening their eyes).

Fig. 1. Two sample items of the Gestaltwahrnehmungstest (Hergovich & Hörnler, 1994).
3.3. Procedure

The GWT for measuring field dependence and the occultism questionnaire were administered to all subjects. Hypnotic induction was carried out in a separate session, and was quite successful. On the six-point scale, about a third of the subjects had values from 4 to 6 on both measures of suggestibility (34.1% on self-assessed suggestibility and 37.4% on experimenter-assessed suggestibility). 35.2% indicated no effect of hypnosis on both measures. The mean suggestibility was 2.76 for self-assessed suggestibility (S.D. = 1.74) and 2.87 for experimenter-assessed suggestibility (S.D. = 1.81). Because the intercorrelation between the two suggestibility scores was as high as 0.85, \( P < 0.001 \), we calculated a new suggestibility score as the sum of the two single suggestibility scores.

4. Results and discussion

First we calculated Spearman–Rank correlations between suggestibility (depth of hypnosis judged by the experimenter and the subjects themselves), field dependence (scores of the GWT) and belief in the paranormal (occultism scale of Böttinger). There was a rather strong correlation between suggestibility and belief in the paranormal (0.46, \( P < 0.001 \)). This indicates that the higher the hypnotic suggestibility, the higher the belief in the paranormal and vice versa. About the same correlation was found between the measure of field dependence and belief in the paranormal (−0.39, which means lower scores on the GWT indicating field dependence correspond to higher scores on the occultism questionnaire). The correlation between suggestibility and field dependence support the view that suggestibility has relations to field dependence (the coefficient was −0.23, \( P = 0.026 \)). Partial correlations reveal that suggestibility and field dependence have an independent influence on the belief in the paranormal. The correlation between suggestibility and belief in the paranormal was 0.41 (\( P < 0.001 \)), if one controls for field dependence, which is basically the same coefficient as without controlling for field dependence. The other way around, the correlation between field dependence and belief in the paranormal was −0.33 (\( P = 0.001 \)), if one controls for suggestibility.

In this study it was shown that there exists a link between field dependence, suggestibility and belief in paranormal phenomena. Confirming the results of Wagner and Ratzeburg (1987), hypnotic suggestibility correlated positively with belief in paranormal phenomena. Field dependence as measured using the GWT also correlated with belief in paranormal phenomena, which is consistent with the previous findings from Roney-Dougal (1987) and Snel et al. (1995).

In Study 2 we examined whether the relationship between suggestibility and belief in paranormal phenomena could also be found for interrogative suggestibility and whether the findings with respect to the relationship between field dependence and belief in paranormal phenomena could be confirmed.

5. Study 2

In the second study, paranormal belief was administered using the PBS of Tobacyk and Milford (1983). This scale, which probably represents the most commonly used scale to assess paranormal belief, has the advantage of being able to measure paranormal belief across different
Field dependence was tested with the EFT from Witkin et al. (1971), which is a widely used instrument for assessing field dependence. This time, suggestibility was operationalized as interrogative suggestibility (Gudjonsson, 1984). For this purpose the GSS was used (Gudjonsson, 1984). The GSS consists of a short story of a woman who is robbed while on holiday in Spain. After listening to the story the subjects have to write down all they remember (immediate recall). Then the subjects are asked 20 questions concerning the content of the story. Fifteen questions are (mis)leading, five questions are added to disguise the real purpose. After filling out the questionnaire and handing it to the experimenter the subjects are told that they have made a number of errors (negative feedback is given) and it would certainly be possible for them to improve their achievement. A new questionnaire with the same 20 questions was again given to them. The number of times the subjects change their answers between the trials is scored as “Shift”. The number of times the subjects answer in accordance with the misleading questions in Trial 1 is recorded as “Yield 1”, whereas the number of times they yield the second time is scored as “Yield 2”. “Yield 1” and “Shift” can be added up to “Total suggestibility”.

5.1. Subjects

Thirty-nine subjects (volunteers) were tested. The mean age was 29.51 ranging from age 17 to 68 (S.D. = 10.35). The sample consisted of 20 males (51.3%) and 19 females (48.7%).

5.2. Procedure

All subjects were first given the GSS and then the PBS. The GSS was presented as a memory task. In separate sessions the EFT was presented individually.

5.3. Results and discussion

First, reliability analyses were calculated. The reliability of the PBS was 0.92 (Cronbach’s alpha). For “Traditional religious belief” the reliability was 0.69, for the subscale “Psi” 0.91, for the subscale “Witchcraft” 0.90, for “Superstition” 0.42, for “Spiritualism” 0.89, for “Extraordinary life forms” 0.60 and for “Precognition” 0.89. For the EFT the reliability coefficient was 0.81.

Field dependence as measured using the EFT correlated significantly with Yield 1 ($r = 0.51, P < 0.01$), Yield 2 ($r = 0.42, P < 0.01$) and the total suggestibility score ($r = 0.37, P < 0.05$), but not with Shift ($r = -0.11$). No significant correlations were found between field dependence and the paranormal belief scale with one exception (the correlation with the scale “Superstition”). The same pattern was found between the suggestibility scores and the paranormal belief scale. Only the scale “Superstition” and the suggestibility scores Yield 2, Shift and Total correlated significantly (Table 1).

These results only partially give evidence of a relationship between suggestibility and field dependence with belief in paranormal phenomena. While interrogative suggestibility and field dependence as measured with the EFT correlated rather strongly, the suggestibility scores and the EFT-scores correlated only with the scale “Superstition” of the PBS. The importance of this finding is highlighted by the fact that belief in “Superstition” is the scale which has the lowest agreement of all scales and therefore also the lowest standard deviation of all subscales. Because a low variance diminishes the size of a correlation, the correlations with “Superstition” of about
0.30 with the suggestibility scores and of 0.45 with field dependence indicate a substantial relationship. If one looks at the content of the scale “Superstition”, all items refer to superstitious thinking or behavior. The items are as follows: “Black cats bring bad luck” (Item 4), “If you break a mirror, you will have bad luck” (Item 11) and “The number ‘13’ is unlucky”. The peculiarity of these items lies in the fact that contrary to the content of the other subscales of the PBS, the scale “Superstition” seems to involve some sort of magical or quasi-magical thinking indicating a belief affecting one’s behavior, which Shafir and Tversky (1992) define as “to describe cases in which people act as if they (...) believe that their action influences the outcome, even though they do not really hold that belief” (1992, p. 463). For example, somebody believing that the number 13 brings bad luck probably knows that her belief is incorrect, but nevertheless is very cautious on the thirteenth of a month. If in contrast one believes in spirits or the possibility of precognition, there is no such “quasi-element” suggesting some sort of confusion between thinking, acting and believing. Maybe it is due to the greater autonomy and psychological differentiation ability (which implies that field independents are better able to separate emotions and cognitions) of field independents (Witkin & Goodenough, 1981) that they can avoid such interference between these different psychological processes. However, this explanation must be viewed with some reservation because of its speculative post-hoc character.

6. Study 3

In this study some modifications were made. To measure the degree of belief in the paranormal, the Paranormal Belief Scale from Tobacyk and Milford (1983) was again given to the subjects. To also assess phenomena of the esoteric scene, such as the belief in remedies of “faith healers”, “the energy of stones”, “astrology” or “palm-reading” one extra scale with seven items was constructed (labelled “Esotericism”) and one further item for the scale “Superstition” (“Broken glass brings luck”) in the hope of improving the reliability of the scale. The Poltergeist Experience Checklist (Houran & Lange, 1998) was also included in the study. Field dependence/independence was assessed with the EFT (Witkin et al., 1971) and for part of the sample also with the GWT (Hergovich & Hörndler, 1994).

Table 1
Correlations between field dependence, suggestibility scores and the Paranormal Belief Scale (Study 2)

<table>
<thead>
<tr>
<th></th>
<th>FD (EFT)</th>
<th>Yield 1</th>
<th>Yield 2</th>
<th>Shift</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Religious belief</td>
<td>0.15</td>
<td>−0.17</td>
<td>−0.02</td>
<td>0.00</td>
<td>−0.14</td>
</tr>
<tr>
<td>Psychokinesis</td>
<td>0.16</td>
<td>−0.17</td>
<td>−0.07</td>
<td>0.07</td>
<td>−0.11</td>
</tr>
<tr>
<td>Witchcraft</td>
<td>0.04</td>
<td>−0.09</td>
<td>−0.05</td>
<td>0.00</td>
<td>−0.08</td>
</tr>
<tr>
<td>Superstition</td>
<td>0.45**</td>
<td>0.21</td>
<td>0.38*</td>
<td>0.32*</td>
<td>0.32*</td>
</tr>
<tr>
<td>Spiritualism</td>
<td>0.10</td>
<td>−0.18</td>
<td>−0.12</td>
<td>0.03</td>
<td>−0.14</td>
</tr>
<tr>
<td>Extraordinary life</td>
<td>0.23</td>
<td>0.10</td>
<td>0.17</td>
<td>−0.07</td>
<td>0.05</td>
</tr>
<tr>
<td>Precognition</td>
<td>0.17</td>
<td>−0.12</td>
<td>−0.03</td>
<td>−0.04</td>
<td>−0.12</td>
</tr>
<tr>
<td>Total score</td>
<td>0.20</td>
<td>−0.14</td>
<td>−0.02</td>
<td>0.04</td>
<td>−0.14</td>
</tr>
</tbody>
</table>

Pearson correlation, only with Superstition Spearman-Rank correlation; FD, field dependence.

*P < 0.05.

**P < 0.01.
Because we had the assumption that the declared degree of belief in the paranormal could be influenced by the assumed attitude of the experimenter or by the experimental situation, we divided the participants into three groups with different instructions. We assumed that the influence of the instructions should be comparable to those of interrogative suggestibility as far as all five components of interrogative suggestibility according to Gudjonsson (1987) are comparable to those present in normal instructions. These components are the nature of the social interaction, a questioning procedure, a suggestive stimulus question, some form of acceptance of the stimulus message, and a behavioral response. However, in our experimental procedure no pressure is present (as in the interrogative design) and we used no leading questions, but leading opinions.

6.1. Subjects

In total, 150 subjects (64 of them—42.7%—were male and 86—57.3%—female) participated. Most of them were students. The mean age was 37.28 years (S.D. = 13.31).

6.2. Procedure

One hundred and forty-nine subjects completed the Embedded Figures Test, the Paranormal Belief Scale and the Poltergeist Experience Checklist (PEC). Fifty subjects also completed the Gestaltwahrnehmungstest. Half of these subjects were tested in this sequence: EFT, PBS, PEC and GWT. For the other half the sequence was: GFT, PEC, PBS and EFT. These precautions were taken mainly to control for practice effects between EFT and GWT. No sequence effects were detected, however (if there were any, the transfer effect ostensibly is the same from EFT to GWT as from GWT to EFT). For those subjects who were not tested using the GWT, the testing sequence was EFT, PBS and PEC for one half and EFT, PEC and PBS for the other half. The PBS was presented with three different instructions:

Group 1 (“No special instructions”): please indicate the extent to which you agree with the following statements:

Group 2 (“Paranormal phenomena not confirmed”): scientific studies have proven that the belief in psi is an universal phenomenon. Psi includes all phenomena which are currently unexplained by the natural sciences and which show certain anomalies to the known laws of physics, phenomena such as telepathy or the movement of material objects by the mind. Although some people actually do believe in these phenomena, according to science there exists no irrefutable proof for any of these phenomena. Further exploration of psi only gives evidence that all paranormal phenomena can be explained by illusion, chance or deception.

We are interested in your point of view. Please indicate the extent to which you agree with the following statements:

Group 3 (“Paranormal phenomena confirmed”): The instructions were the same as for Group 2 with the exception that the wording in italics (the critical part) was replaced with “In recent years, leading scientists were able to settle the question as to the reality of these phenomena for the first time. They have proven beyond a doubt that these phenomena really do exist”.

Before approaching the subjects they were randomly assigned to a group.
6.3. Hypotheses

As before, it was assumed that there exists a positive relationship between field dependence and belief in paranormal phenomena, especially with respect to the scale superstition.

Secondly we expected that the degree of declared belief in paranormal phenomena will vary depending on the different instructions. In Group 2 (“paranormal phenomena confirmed”) the belief in the paranormal should be the highest and in Group 3 (“paranormal phenomena not confirmed”) the lowest.

A third hypothesis was made based on the influence of the different instructions on paranormal belief depending on the cognitive style of field dependence. It was postulated that the degree of field dependence would interact with the different instructions. Thus field-dependent subjects should be more influenced by the instructions than field-independent subjects. Therefore one should find stronger differences in the belief in paranormal phenomena based on the different instructions between field dependent subjects than between field independent subjects.

6.4. Results and discussion

For the EFT the reliability was 0.82 (Cronbach’s alpha) and for the GWT 0.91 (the correlation between EFT and GWT was −0.57). The reliability scores for the subscales were as follows: 0.72 for “Traditional religious belief”, 0.71 for the subscale “Psi”, 0.79 for “Witchcraft”, 0.75 for “Superstition”, 0.78 for “Spiritualism”, 0.60 for “Extraordinary life forms”, 0.77 for “Precognition” and 0.74 for the new subscale “Esotericism”. For the total score (with scale “Esotericism”), Cronbach’s alpha was 0.92. For the scale PEC the reliability was 0.73.

Overall the correlations between field dependence and belief in the paranormal pointed in the same direction indicating that the more field-dependent the subject, the higher their belief in paranormal phenomena, although most of the correlation coefficients were not very high (Table 2). For the GWT, the correlation with the scale “Esotericism” (r = −0.35) was significant, whereas the correlations with “Psychokinesis” and the total score nearly reached significance (P < 0.10). That means that the more field dependent, the higher is the paranormal belief, especially the belief as measured using the scale “Esotericism”. For field dependence measured using the EFT the correlation with the scale “Superstition” (r = 0.28) was significant, confirming the result of Study 2 and again suggesting that field dependence goes along with a higher tendency for “Superstition”. The correlations with “Traditional religiosity” and “Precognition” nearly reached significance (P < 0.10).

To examine Hypotheses 2 and 3 one two-way analysis of variance was performed on the belief in paranormal phenomena (all scales of the PBS + the new scale Esotericism) for the factors instruction (1–3) and field dependence (the subjects were divided into three groups according to a percentile of 33 and 66 percent in the EFT). The Levene test of homogeneity of the error variances gave a non-significant result (F(8,140) = 1.45, P > 0.05). There was no significant main effect (F(2,140) = 1.39, P = 0.254 for the instructions and F(2,140) = 0.70, P = 0.500 for field dependence), although the interaction between instructions and field dependence reached near significance F(4,140) = 2.03, P = 0.094). However, no post-hoc tests reached significance.

A second two-way analysis of variance with the same factors as above and “Superstition” as the dependent variable (Levene test: F(8,140) = 1.85, P > 0.05) revealed a main effect of field
dependence \((F(2,140) = 3.17, P = 0.045)\). The effect of the instructions \((F(2,140) = 0.70, P = 0.497)\) and the interaction between field dependence and the instruction was not significant \((F(4,140) = 0.45, P = 0.774)\). Post hoc tests revealed that the difference between Group 1 (field independents) and Group 3 (field dependents) was significant (Scheffé, \(P = 0.048\)). Thus, field-dependent subjects had higher scores on the superstition scale than field-independent subjects across all instructions. For the mean scores see Table 3.

In sum, this study revealed partial support of the hypothesis that field-dependent subjects exhibit a higher degree of belief in paranormal phenomena. Most importantly, the results concerning the relationship with the scale “Superstition” of the PBS were confirmed. With regard to the hypotheses: Hypothesis 1 could be partially confirmed. We found positive correlations

### Table 2

Spearman–Rank correlations between field dependence and the Paranormal Belief Scale (Study 3)

<table>
<thead>
<tr>
<th></th>
<th>GWT ((n = 50))</th>
<th>EFT ((n = 149))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Religious belief</td>
<td>−0.22</td>
<td>0.20*</td>
</tr>
<tr>
<td>Psychokinesis</td>
<td>−0.26*</td>
<td>0.07</td>
</tr>
<tr>
<td>Witchcraft</td>
<td>−0.11</td>
<td>−0.12</td>
</tr>
<tr>
<td>Superstition</td>
<td>0.00</td>
<td>0.28**</td>
</tr>
<tr>
<td>Spiritualism</td>
<td>−0.18</td>
<td>−0.10</td>
</tr>
<tr>
<td>Extraordinary life</td>
<td>0.06</td>
<td>−0.12</td>
</tr>
<tr>
<td>Precognition</td>
<td>−0.19</td>
<td>0.15+</td>
</tr>
<tr>
<td>Esotericism</td>
<td>−0.35*</td>
<td>0.12</td>
</tr>
<tr>
<td>Total score</td>
<td>−0.26+</td>
<td>0.08</td>
</tr>
<tr>
<td>Poltergeist</td>
<td>0.19</td>
<td>−0.01</td>
</tr>
</tbody>
</table>

Total score, sum of all scales of the PBS plus the scale “Esotericism”. BWT, Gestalt perception test; EFT, Embedded Figures Test.

*\(P < 0.05\); **\(P < 0.01\); + \(P < 0.10\).

### Table 3

Means of FD and FI in the scale “Superstition” across the different instructions (Study 3)

<table>
<thead>
<tr>
<th>Instruction</th>
<th>Groups</th>
<th>Means(^a)</th>
<th>S.D.</th>
<th>(n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No instruction</td>
<td>FI (33%)</td>
<td>4.47</td>
<td>1.28</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>MG (66%)</td>
<td>5.50</td>
<td>1.55</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>FD</td>
<td>6.56</td>
<td>2.78</td>
<td>16</td>
</tr>
<tr>
<td>Psi not confirmed</td>
<td>FI (33%)</td>
<td>5.53</td>
<td>3.20</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>MG (66%)</td>
<td>5.54</td>
<td>1.90</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>FD</td>
<td>6.06</td>
<td>2.44</td>
<td>17</td>
</tr>
<tr>
<td>Psi confirmed</td>
<td>FI (33%)</td>
<td>5.69</td>
<td>2.39</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>MG (66%)</td>
<td>5.71</td>
<td>3.74</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>FD</td>
<td>7.00</td>
<td>3.02</td>
<td>17</td>
</tr>
</tbody>
</table>

FD, Field dependents; MG, middle group (between field dependence and independence); FI, field independents.

\(^a\) Possible values range from 4 to 20.
between field dependence and paranormal belief, although the size of most correlation coefficients was rather small and non-significant. The relationship between field dependence (at least as measured with the GWT) and superstition was supported. Field-dependent subjects exhibited a higher degree of superstition than field-independent subjects. Hypothesis 2 could not be confirmed. The instruction had no significant effect on the belief in the paranormal, though the mean values point in the supposed direction. Hypothesis 3 as well could not be confirmed. The interaction between instructions and field dependence nearly reached significance, but the post hoc tests were not significant. Thus, it could not be proven that field dependents were more influenced by the instructions than were field independents.

7. General discussion

The results of the three studies show that field dependence and suggestibility are to some extent positively associated with belief in the paranormal. According to the results of Study 1, field dependence had rather high correlations with belief in paranormal phenomena (as measured using the “Occultism scale”). In Studies 2 and 3, the relationship between field dependence and belief in paranormal phenomena mainly held for subscales of the PBS, like “Superstition” or the newly-built scale “Esotericism”. In Study 3, a variance analysis further proved that field dependence had a major effect on superstition across all three instruction groups. With respect to suggestibility, the results are very similar. For hypnotic suggestibility and belief in paranormal phenomena substantial correlations were revealed in Study 1. Substantial correlations were also found between the scores of interrogative suggestibility and “Superstition” in Study 2.

In order to test the extent to which the scores of the occultism scale of Study 1 are comparable with the scores of the PBS in Studies 2 and 3, we administered the PBS (we also included the extra scale “Esotericism”) and the occultism scale from Böttinger to a sample of students of one introductory course in psychology (n = 87). The correlation between the PBS and the occultism scale was 0.76 (P < 0.001). The correlations between subscales of the PBS and the occultism scale, except for the correlation with the scale “Traditional religious belief” (r = 0.08), were all highly significant. A further analysis of the results of Study 1 on the item-level revealed that field dependence as measured with the GWT had the highest correlations with those items of the “Occultism scale” which correspond to items of the scale “Superstition” of the PBS and the new scale “Esotericism”, indicating that the substantial correlation between field dependence and belief in paranormal phenomena in Study 1 can be attributed mainly to the items measuring “Superstition” and “Esotericism”.

The correlations between the suggestibility scores and the field dependence scores in Studies 1 and 2 clearly show that there is also a rather strong relationship between suggestibility and field dependence, indicating that field dependence goes along with greater suggestibility. The size of the correlation coefficients was greater for interrogative suggestibility (the coefficients lie between 0.37 and 0.51) than for hypnotic suggestibility (the coefficient was −0.23). The relationship between suggestibility and field dependence is highlighted by the fact that the pattern of the correlations for the field dependence scores is very similar to those of the suggestibility scores. Thus, the suggestibility scores in Study 2 also had only significant correlations with the subscale “Superstition”.

On a theoretical level, it is suggested that the greater autonomy of field independents and the greater sensitivity to social cues of field dependents, which may explain the relationship between suggestibility and field dependence (Gudjonsson, in press), is also relevant for the relationship between these two constructs and belief in “Superstition” or “Esotericism”. Field independents, who can organize and structure their world by themselves, don’t need external references like social cues from other people (Melancon & Thompson, 1989; Witkin & Goodenough, 1981). Field dependents function less autonomously and accede to the dominant properties of the field. Possibly in situations of uncertainty and emotional stress like an exam (these situations are characteristic to invoke superstitious behavior, Vyse, 1997) the superstitious belief can help to cope with it. Consistent with these considerations, Irwin (1993) proposes a model which postulates coping with uncontrollable life-events as a determinant of belief in paranormal phenomena. Interestingly, the method of coping was also seen as a link between state anxiety and interrogative suggestibility (Gudjonsson, 1988a). Perhaps on a cognitive explanation level the working memory plays a causal role in this regard. Thus, there exists a relationship between impaired memory and suggestibility (Gudjonsson, 1988b) as well as between field dependence and impaired memory (Miyake, Witzki, & Emerson, 2001). Miyake et al. (2001) also showed that field-independent performance was negatively affected if the executive components of working memory were needed for concurrent tasks like the generation of random numbers. These results fit in well with the findings of Brugger and Baumann (1994), which demonstrate that believers in paranormal phenomena cannot generate random numbers as well as skeptics. Apart from these considerations, the already mentioned hemispheric asymmetry which was found for field dependents (Berlin & Languis, 1981) and believers in psi (Brugger et al., 1993) could also contribute to the current findings.

What is the resumé of the three studies? There are clear signs of a relationship between suggestibility and field dependence with belief in paranormal phenomena. It seems that the relationship only has modest general validity, and in particular concerns contents such as belief in astrology, esotericism or superstitious thinking. The proper contents of parapsychological research, meaning psi-phenomena (extrasensory perception and psychokinesis) have only a small, although also positive relationship to suggestibility and field dependence. It also looks as though the suggestibility scores and field dependence scores have an influence in the same direction, although the variables are not interchangeable.

References


Murphy, K., & Lester, D. (1976). A search for correlates of belief in ESP. Psychological Reports, 38, 82.


