CASE HISTORY AND SHORTER COMMUNICATION

Imagery ability and exposure in vivo in spider phobia

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(Received 16 August 1990)

Summary—The present study deals with the effect of imagery ability on treatment outcome in spider phobias. Thirty-eight spider phobics completed the Questionnaire on Mental Imagery (QMI) and the Spider Questionnaire (SPQ). Subjects also went through a behavioral approach task (BAT) during which heart rate and avoidance behavior were measured. Each subject was then given one-session treatment as described by Orl. Immediately after treatment, SPQ and BAT data were again obtained. On the basis of their QMI scores, subjects were assigned to a 'good', 'moderate', or 'poor' imagers group. Neither pre-treatment nor post-treatment measures were found to vary as a function of imagery ability. Thus it appears that, at least for specific phobias such as spider fear, imagery ability is not a relevant variable for predicting the effects of in vivo exposure.

INTRODUCTION

According to Lang's (1985) bio-informational theory, phobic anxiety is the product of an associative network stored in the brain. This network contains representations, i.e. images of certain phobic stimuli that are associatively linked to response tendencies. Lang's theory also assumes that psychophysiological responses (e.g. cardiac acceleration) evoked by imagery of phobic scenes reflect the accessibility of the fear network (Cuthbert & Lang, 1989; Foa & Kozak, 1986). Accordingly, much research prompted by Lang's formulation has been concerned with the differences in psychophysiological reactivity during phobic imagery among the various anxiety disorders. On the basis of this research, it has become clear that simple phobias are characterized by a coherent network in which a few discrete stimulus elements (e.g. crawling, 'snake-like' movements) are directly connected to certain response elements (e.g. cardiac acceleration, avoidance). In contrast, agoraphobia is characterized by a more diffuse associative network (Lang, 1988).

As Foa and Kozak (1986) pointed out, Lang's theory has several interesting and testable implications for behavioral treatment of phobic disorders. For one thing, the bio-informational theory suggests that activation of the phobic network (e.g. by imagery or exposure in vivo) is a prerequisite for extinction of fear responses to occur. From this, it can be inferred that the more accessible a phobic network is, the more likely extinction of fear will take place. There is indeed some evidence to indicate that physiological responsivity (reflecting accessibility of the fear network) to phobic imagery is positively correlated to treatment outcome (Levin, Cook & Lang, 1982).

It is plausible to assume that accessibility of the fear network is not only dependent on the type of phobia but also on trait factors. One important trait factor might be the patient's capacity to produce vivid images (Lang, 1987). Several studies found (reviewed by Cuthbert & Lang, 1989; Lang, 1988) that among Ss with simple phobias, 'good' imagers respond with stronger physiological responses to phobic images (e.g. images of a live snake) than 'poor' imagers. However, Cook, Melamed, Cuthbert, McNeill and Lang (1988) demonstrated that this positive relationship between imagery ability and physiological reactivity does not hold for agoraphobia. Taken together, these findings suggest that, at least in simple phobias, 'good' imagers have better access to the fear network and, consequently, will benefit more from behavioral exposure than 'poor' imagers.

Using a sample of spider phobics (n = 38), the present study examined whether individual differences in imagery ability are related to effectiveness of exposure in vivo. On the basis of Sheenan's version (1967) of Betts Questionnaire on Mental Imagery (QMI), spider phobics were assigned to a 'good', 'moderate' or a 'poor' imagers group. The groups were given one-session exposure treatment as described by Orl (1989). The hypothesis tested was that this treatment is more effective in 'good' than 'poor' imagers.

METHOD

Subjects

Ss were 38 spider phobics (35 women). They were recruited by advertisements in local newspapers. In these advertisements, spider phobics were invited to participate in research concerned with the origins of fears in return for 'free' treatment. The mean age was 32.4 yr (range: 17-54 yr). The mean score on the Spider Questionnaire (SPQ; Korman, Weerta, Hastings, Melamed & Lang, 1974) was 23.1 (SD = 3.3), which is comparable to the mean score (23.8; SD = 3.4) reported by Fredrikson for his phobic sample.

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Table 1. Pre-treatment and post-treatment scores of ‘good’, ‘moderate’, and ‘poor’ images.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Good</th>
<th>Moderate</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRE</td>
<td>23.7 (3.4)</td>
<td>22.5 (3.2)</td>
<td>23.3 (3.5)</td>
</tr>
<tr>
<td>BAT</td>
<td>3.5 (3.4)</td>
<td>3.6 (2.5)</td>
<td>3.0 (1.5)</td>
</tr>
<tr>
<td>HR</td>
<td>87 (14)</td>
<td>78 (13)</td>
<td>94 (19)</td>
</tr>
<tr>
<td>POST</td>
<td>12.1 (5.4)</td>
<td>12.1 (4.5)</td>
<td>11.1 (4.8)</td>
</tr>
<tr>
<td>SPQ</td>
<td>8.5 (3.8)</td>
<td>9.2 (2.6)</td>
<td>8.7 (3.0)</td>
</tr>
<tr>
<td>BAT</td>
<td>91 (11)</td>
<td>87 (19)</td>
<td>87 (16)</td>
</tr>
</tbody>
</table>

SPQ; spider questionnaires (0-31). BAT; behavioral approach task (0-12). HR; heart rate during BAT (in bpm).

Assessment and procedure

Ss first completed the QMI and the SPQ. The QMI (Sheenan, 1967) has been widely used to measure imagery ability (e.g., Cook et al., 1989). It contains 35 items which pertain to images in specific modalities (e.g., in the visual modality: ‘seeing a sunset’; in the auditory modality: ‘hearing steam escape from a boiling kettle’; etc.). Ss are asked to rate the vividness of these images on a 7-point scale (1 = ‘very vivid’; 7 = ‘not at all vivid’). The total QMI score varies between 35 (very good imagery ability) and 245 (very poor imagery ability).

The SPQ is a 31-item self-report instrument that measures fear of spiders. It has reasonable psychometric properties (Klorman et al., 1974) and has been recommended as an outcome measure (Fredrikson, 1983).

Having completed the QMI and SPQ, Ss carried out a behavioral approach task (BAT). The Ss were seated in a comfortable chair in a dimly lit, sound attenuated chamber. A large table (approx. 1 x 4 m) was placed in front of the Ss. A movable box of Plexiglass containing a live spider (Tegenaria) was placed at the far end of the table. The Ss held a string connected to the box in their dominant hand and were instructed to advance the box up to a point at which they began to feel uncomfortable. It was stressed that they by no means should force themselves. BAT performance was scored on a 13-point scale ranging from 0 (distance between S and spider more than 3 m) to 12 (‘spider on hand’). Additionally, heart rate (HR) during the BAT was recorded with a transilluminated plethysmograph connected to a Beckman Pulse/Precision/Volume Coupler. Following the BAT, Ss were treated with the one-session therapy described by Oso (1989). This treatment method consists of a combination of exposure in vivo and, if necessary, modeling. During the treatment, Ss are encouraged, in a stepwise manner, to interact with phobic stimuli (i.e., spiders). The ultimate goal of the treatment is for Ss to be able to tolerate physical contact with the phobic stimulus. Preliminary results presented by Oso (1989) indicate that this treatment yields good immediate and long-term results.

The treatment lasted about 2.5 h. Ss were then allowed a short rest. Finally, Ss completed the SPQ and carried out the BAT again.

RESULTS

QMI scores ranged from 38 to 148. Ss (n = 13) in the lower 33% of the QMI distribution were assigned to the ‘good’ images group, whereas Ss (n = 12) in the upper 33% of the distribution were assigned to the ‘poor’ imagers group. The remaining Ss (n = 12) were assigned to a ‘moderate’ imagers group. Mean QMI scores of ‘good’, ‘moderate’, and ‘poor’ images were 57.5, 85.4, and 117.4, respectively [F(2, 35) = 88.4, P < 0.01].

Table 1 shows pre- and post-treatment data of the three groups. For each variable, a 3 (groups) x 2 (pre- vs post-treatment) analysis of variance (ANOVA), with the last factor being a repeated measure, was carried out. An ANOVA performed on the SPQ scores yielded a main effect of treatment [F(1, 35) = 230, P < 0.01]. However, neither the main effect of group, nor the interaction term reached significance [both: F(2, 35) < 1]. As for the BAT data, a highly significant effect of treatment emerged [F(1, 35) = 53.5, P < 0.01]. But again, no significant main effect of group [F(2, 35) < 1], nor interaction effect of group [F(2, 35) < 1] was found. An ANOVA of the HR data during BAT yielded an effect of treatment approaching significance [F(1, 35) = 3.7, P = 0.06]. This effect was due to a general increase in HR. It should be noted that during the post-treatment BAT, the distance between spider and Ss was smaller than during pre-treatment BAT. No further effects reached significance.

In sum, no pre-treatment differences were found between ‘good’, ‘moderate’ and ‘poor’ imagers. For both SPQ and BAT, clear treatment effects occurred, but these effects were not modulated by imagery ability (QMI).

A correlational approach confirmed this pattern of results. Pearson product-moment correlations between QMI and pre- and post-treatment measures were generally low and non-significant. They varied between 0.15 [r(QMI/post-treatment BAT), P = 0.17, one-tailed] and -0.18 [r(QMI post-treatment SPQ), P = 0.14, one-tailed].

DISCUSSION

Foa and Kozak (1986) argue that accessing the fear network is a prerequisite for modification, i.e., extinction of phobic responses to occur. They also suggest that pre-existing differences in imagery ability “may influence emotional processing during exposure” (p. 24). As noted earlier there is, indeed, inferential evidence to sustain this view. “Good” imagers have been found to show greater physiological responses to fear-relevant images than “poor” imagers and strong physiological reactors are known to benefit more from flooding or systematic desensitization (see reviews by Foa & Kozak, 1986; Cuthbert & Lang, 1989).

In contrast to the position of Foa and Kozak (1986), the present results show that, at least in spider phobics, imagery ability does not affect short-term effects of exposure in vivo. One could counter that imagery ability may play an important role whenever imaginal exposure techniques rather than in vivo exposure are used. However, keeping in mind that exposure in vivo is the treatment of choice for simple phobias (Emmelkamp, 1982), the present results suggest that imagery ability is not a clinically relevant factor in the treatment of specific phobias. Two additional remarks are in order. Firstly, it may
well be the case that long-term effects of in vitro exposure are modulated by imagery ability. We are currently examining this issue. Secondly, there are clear individual differences in the extent to which people benefit from exposure in vitro. Identification of the factors that are responsible for these differences remains an important research goal. While it seems that at least in the case of spider phobics, imagery ability is not a relevant variable, other factors, possibly related to imagery, such as worrying (Borkovec & Hu, 1990) may play a critical role in treatment effects.

REFERENCES


