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Shorter communication
Learning history in fear of blushing

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Abstract

Two studies, investigating the learning history (i.e. traumatic conditioning experiences, vicarious learning, informational learning) of individuals with and without fear of blushing, are presented. In study 1, individuals high ($n = 61$) and low ($n = 59$) in fear of blushing completed the (revised) Phobic Origin Questionnaire [POQ; Öst, L. G., & Hugdahl, K. (1981). Acquisition of phobias and anxiety response patterns in clinical patients. *Behavior Research and Therapy*, 19, 439–447]. In study 2, individuals who applied for treatment for fear of blushing ($n = 31$) and a nonfearful, matched control group ($n = 31$) were interviewed with the same instrument, taking into account only specific memories. High fearful individuals reported more negative learning experiences in connection with blushing than low fearful individuals, irrespective of the type of questioning. Meanwhile, study 1 (written POQ) produced higher percentages of negative learning experiences for both high and low fearful individuals than study 2 (interview). It is concluded that the POQ interview showed a more realistic picture than the written POQ. The possible role of learning history in the acquisition of fear of blushing is discussed. © 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Fear of blushing; Learning history; Traumatic experiences; Conditioning experiences; Vicarious learning; Informational learning; Social phobia

1. Introduction

Fear of bodily symptoms, like blushing, is known to be a prominent complaint for many social phobics (Edelmann, 1990). In various cases, the social phobic fear even concerns specifically the appearance of bodily symptoms; that is, the individual is afraid of negative

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evaluation *because of* (the supposed visibility of) blushing. Some individuals experience so much distress as a result of fear of blushing that they develop a blushing phobia and seek treatment (Scholing & Emmelkamp, 1993; Bögels, Mulkens & de Jong, 1997).

Little is known about the causes of fear of blushing. Some investigations about the possible developmental course of social phobia do exist, suggesting that multiple factors may be involved (Townesley Stemberger, Turner, Beidel & Calhoun, 1995), although it often remains unclear whether the variables detected are the cause or the result of the disorder. The presumed influential mechanisms include familial factors and genetic transmission (e.g. Reich & Yates, 1988; Kendler, Neale, Kessler, Heath & Eaves, 1992; Fyer, Mannuzza, Chapman, Liebowitz & Klein, 1993), biological variables, such as increased heart rates and a potential role of the central dopaminergic system in social phobics (e.g. Beidel, Turner & Dancu, 1985; Levin, Schneier & Liebowitz, 1989), personality characteristics, such as neuroticism and introversion, shyness and behavioral inhibition (e.g. Eysenck, 1982; Bruch, 1989; Turner, Beidel & Townesley, 1990; Kagan, Snidman & Arcus, 1992), parental rearing styles, like overprotectiveness and stressing the importance of others' opinions (e.g. Parker, 1979; Bruch, 1989; Bruch & Heimberg, 1994) and learning history, including traumatic conditioning experiences (e.g. Öst & Hugdahl, 1981).

An investigation by Townesley Stemberger et al. (1995), in which several of the above mentioned variables were taken into account (i.e. family history of anxiety, childhood shyness, extraversion, neuroticism and history of traumatic conditioning experiences), showed that traumatic experiences and shyness were associated with the development of social phobia. It seems reasonable to argue that traumatic experiences also play a major role in the acquisition of fear of blushing. Blushing, like red hair or glasses, is a salient feature and, therefore, an easy object for teasing among children. Moreover, being accused of blushing is enough to evoke a blush (cf. Leary, Britt, Cutlip & Templeton, 1992), which might reinforce teasing. In line with this, it is our clinical impression that individuals with fear of blushing often report a history of being ragged about blushing. For instance, some patients remembered being called "tomato" or "lighthouse" in their childhood.

Learning history is considered to be an important determinant in the acquisition of fears and phobias. In 1939, the two-stage theory of fear and avoidance was introduced by Mowrer (1939), and has become known as the conditioning theory. After varying adjustments and elaborations of the theory, Rachman (1977) proposed three possible pathways to fear: (1) conditioning (direct pathway), (2) vicarious acquisition (indirect) and (3) acquisition by transmission of information and/or instruction (indirect). Since the introduction of the "three pathways to fear", research on the acquisition of fears and phobias drew heavily on this proposed integration, several studies (e.g. Merckelbach, Arntz, Arrindell & de Jong, 1992) using the Phobic Origin Questionnaire (POQ; Öst & Hugdahl, 1981), a paper-and-pencil test that asks phobic patients to what extent their fears developed along a direct (traumatic experiences) or an indirect (vicarious learning and/or negative information) pathway.

Research by Öst and Hugdahl (1981), using the POQ, indicated that among social phobic patients, a majority (58%) traced the origin of their fears to an aversive conditioning incident, whereas 13% traced the origin to vicarious experiences, 3% to informational learning and 26% had no recall. An important limitation of this study is, however, that it failed to take into account the responses of a nonphobic control group. Furthermore, the POQ was criticized

because of its supposed inadequate definition of direct conditioning (Menzies & Clarke, 1994; Menzies, Kirkby & Harris, 1998): from the type of questioning (no rules with respect to CS–UCS pairings) and answering (yes/no) in the original POQ, it would remain unclear whether conditioning events had indeed taken place. This methodology might have led to an overestimation of the frequency of conditioned cases (e.g. Menzies & Clarke, 1994).

Townsley Stemberger et al. (1995) used the Social Anxiety History and Interview Questionnaire-Revised (SAHIQ-R; Turner, Beidel, Dancu & Keys, 1986) to assess whether individuals had experienced an identifiable social “traumatic” episode. Results indicated that individuals with social phobia and normal control individuals differed significantly on reporting traumatic social experiences. That is, when all participants with social phobia (i.e. generalized social phobia and specific social phobia) in this study were combined into a single group, 44% of them had a history of traumatic conditioning events, compared with 20% of those in the normal control group. Compared to the results of Öst and Hugdahl (1981), previously mentioned, the percentages of Townsley Stemberger et al. (1995) are somewhat lower. This difference might well be due to differences in the methodology of questioning.

The aim of the present two studies was to investigate, in an analogous population and in a treatment-seeking population, to what extent individuals with fear of blushing, compared with control individuals, had gone through aversive conditioning experiences, vicarious learning experiences, and/or informational learning experiences with regard to blushing. The inclusion of a nonphobic group might provide a clue as to whether negative learning experiences necessarily give rise to phobic complaints (Merckelbach et al., 1992). Besides, we wondered whether it would make any difference to the pattern of results when a revised version of the original POQ was used (a written version in which the specificity of experiences remained unclear and only yes/no could be answered), or an oral version of the POQ was given (which allowed the interviewer to check the specificity of the reported experiences and the presence of a traumatic CS–UCS pairing, and during which participants’ memories were prompted).

In study 1, individuals with high and low scores with respect to fear of blushing were selected from a large group of students, using the 30% highest and lowest scores. They were given the written (“yes”/“no”) version of the POQ. In study 2, individuals who had applied for treatment for fear of blushing and a nonfearful, matched, control group were given an oral version of the POQ, in which only specific memories were taken into account.

2. Study I

2.1. Method

2.1.1. Participants

Participants were taken from a group of 194 (61 men) first year undergraduate students of Maastricht University (69.6% studied Health Sciences, 28.9% Medicine and 1.5% other) who volunteered to participate in a questionnaire study. Volunteers completed a series of 18 questionnaires in groups of 10–20 persons, for which they received a small fee. The “Fear of Blushing” subscale of the Blushing, Trembling, and Sweating-Questionnaire (BTS-Q; Bögels &

Reith, in press) and a slightly revised version of the Phobic Origin Questionnaire (POQ; Öst & Hugdahl, 1981) were part of the test battery. The other questionnaires were intended to answer different research questions.

To create two extreme groups with regard to fear of blushing, only individuals with scores in the lowest and highest 30% of the distribution of the scores on the “Fear of Blushing” subscale were taken into consideration. The high fearful group consisted of 61 individuals (15 men) with a mean age of 19.9 years (range 18–40; S.D. 3.0) and a mean Fear of Blushing score of 43.2 (range 28.2–77; S.D. 11.3). The low fearful group consisted of 59 individuals (21 men) with a mean age of 20.4 years (range 18–39; S.D. 3.2) and a mean Fear of Blushing score of 4.4 (range 0–10.2; S.D. 2.6). The high and the low fearful group did not differ with respect to age ($t(118) = 0.90, p > 0.05$) and sex ($\chi^2(1) = 1.7, p > 0.05$).

2.1.2. Assessment

The BTS-Q Fear of Blushing subscale (Bögels & Reith, in press) measures, by visual analogue scales (VASs), the extent to which individuals experience blushing as a problem and are afraid to blush (e.g. “To what extent are you hindered in your daily functioning by blushing?”). Research concerning the psychometric properties of the BTS-Q indicates that it is a highly reliable instrument and that it has good discriminant validity; the subscale Fear of Blushing (or Trembling or Sweating) is able to discriminate not only social phobics from controls, but also social phobics with fear of bodily symptoms from social phobics without such fears (Bögels & Reith, in press).

Individuals completed a slightly revised version of the “learning history” section of the POQ (Öst & Hugdahl, 1981). This consists of nine questions that have to be answered in a yes/no format. The revision concerns the phrasing of the conditioning questions: in the original POQ, participants are asked to think back about their phobia and to try to remember how it started; then, they are asked whether they can remember if the fear started with any specific event or situation where they experienced strong discomfort and/or anxiety (no clear CS–UCS pairing). In our POQ, individuals were asked whether they remembered any painful or traumatic events in connection with blushing (*conditioning experiences*: three questions, e.g. “Have you ever experienced a nasty or painful situation because you were blushing?”). Next, they were asked whether they had family members or close friends who were afraid of blushing (*vicarious learning*: three questions, e.g. “Is your mother afraid to blush?”), and whether they heard negative information about blushing (*informational learning*: three questions, e.g. “Have you ever heard unpleasant things about blushing in the media (such as on T.V., on the radio, in magazines or books?)”). The presence of at least one “yes” in a category was considered sufficient to assign an individual to that specific category. This procedure allows for the possibility that participants are assigned to more than one category (see also Merckelbach et al., 1992). Two extra questions were added in order to verify the answers to the conditioning questions: “Have you ever been teased or ragged because of blushing?” and “Have you ever been laughed at or humiliated because of blushing?”. When either or both of these questions were answered affirmatively while none of the conditioning questions were, the conditioning category was still considered to be answered in the affirmative.

2.2. Results

The frequency of high and low fearful individuals who answered at least one conditioning item, vicarious learning item, and/or informational learning item with “yes”, is presented in Table 1.

The number of individuals who answered affirmatively to at least one conditioning question was significantly higher in the high fearful group than in the low fearful group ($\chi^2(1)=18.8$, $p < 0.001$). Similar results were obtained for the vicarious learning category ($\chi^2(1)=9.7$, $p < 0.005$). In the case of informational learning, however, no difference emerged between the high and the low fearful group ($\chi^2(1)=1.3$, $p = 0.25$).

3. Study II

3.1. Method

3.1.1. Participants

Thirty-one individuals (seven men) with a primary diagnosis of social phobia, with fear of blushing in social situations as the most prominent fear (DSM-IV; American Psychiatric Association, 1994), were included in the present study. Participants had applied for treatment in a program in which people who suffered from fear of blushing were offered free treatment in exchange for participating in research (Mulkens, Bögels, de Jong & Louwers, 1998). Mean age was 25.5 yr (range 14–49; S.D. 9.3). Mean onset age of the complaint was 13.4 (range 4–38; S.D. 6.6). Mean score on the BTS-Q subscale Fear of Blushing was 68.2 (range 43.3–93.8; S.D. 13.4), which is considerably higher than that of a student population (22.0 (S.D. 17.0)) (Bögels, Alberts & de Jong, 1996), but comparable to that of a treatment-seeking group at a mental health centre (66.0 (S.D. 26.0)) (Bögels & Reith, unpublished data).

Thirty-one control participants (10 men) were recruited by means of an advertisement in the local newspaper and among students and university employees. They were matched with fearful individuals on age, sex and educational level. Mean age of the control participants was 26.9 (range 15–47; S.D. 9.7), mean Fear of Blushing score was 18.1 (range 0–40.5; S.D. 12.4). Fearful and control individuals did not differ with respect to age ($t(60)=-0.59$, $p > 0.05$), sex ($\chi^2(1)=0.73$, $p > 0.05$) and educational level ($\chi^2(4)=0.73$, $p > 0.05$).

Table 1

Frequency of high ($n = 61$) and low ($n = 59$) fearful individuals who answered at least one conditioning item, vicarious learning item, and/or informational learning item with “yes”

Type of experience	High fearful individuals		Low fearful individuals	
	<i>n</i>	%	<i>n</i>	%
Conditioning	59	96.7	39	66.1
Vicarious learning	43	70.5	25	42.4
Informational learning	48	78.7	41	69.5

3.1.2. Assessment

During the intake session before the treatment, blushing phobics were interviewed using the same revised version of the POQ (Öst & Hugdahl, 1981). Individuals were given sufficient time to think seriously about every question, and were allowed to hark back to earlier questions. They were also provided with a standard example in each category. The presence of at least one specific memory was considered sufficient to assign an individual to the conditioning, vicarious learning and/or informational learning category. Thus, participants could be assigned to more than one category. When no specific memory could be reproduced with regard to any of the questions in a category, the individual was not assigned to the category concerned. Control participants were given the same oral version of the POQ.

3.2. Results

The frequency of blushing phobics and control participants who could remember at least one specific conditioning experience, vicarious learning experience, and/or informational learning experience is presented in Table 2.

The frequency of individuals who reported specific memories with regard to conditioning items was significantly higher in the phobic group than in the control group ($\chi^2(1)=5.4$, $p < 0.05$). Similar results were obtained for the frequency of individuals who reported specific informational learning items ($\chi^2(1)=4.3$, $p < 0.05$). In the case of vicarious learning, however, the analysis revealed a trend ($\chi^2(1)=3.2$, $p = 0.07$), indicating that more phobic individuals than control individuals reported specific vicarious learning items.

4. Discussion

The main results of the two studies can be summarized as follows. (1) Individuals with fear of blushing more often reported having experienced conditioning experiences with regard to blushing than control individuals. This was the case for both studies. (2) With regard to vicarious learning, a similar pattern emerged: individuals with high scores on fear of blushing more often reported having had such experiences, as opposed to individuals with low scores. This difference was significant in study 1, while it reflected a tendency in study 2. (3)

Table 2

Frequency of fearful individuals ($n = 31$) and control participants ($n = 31$) who could remember at least one specific conditioning experience, vicarious learning experience and/or informational learning experience in connection with blushing

Type of experience	Blushing phobics		Control participants	
	<i>n</i>	%	<i>n</i>	%
Conditioning	23	74	14	45
Vicarious learning	17	55	10	32
Informational learning	11	35	4	13

Informational learning experiences followed a dissimilar pattern: these experiences were equally present in both high and low fearful individuals in study 1, whereas in study 2, specific informational learning events were more prominent in phobic individuals. (4) Globally, the results were equal across both studies, but much higher percentages were obtained in study 1.

The finding that high fearful individuals more often report negative conditioning experiences than controls suggests that negative conditioning events are at the basis of the development of fear of blushing. However, this is not necessarily the case. High fearful individuals might already have been afraid of blushing before these experiences took place. Neither the questionnaire nor the interview asked the individual if blushing (the CS) was a neutral event prior to the pairing with the aversive UCS. Furthermore, high fearful individuals might be much better able to pay attention to or to recall negative conditioning events with respect to blushing, simply because these events matter more to them now. Next, individuals with fear of blushing might have a lower threshold to qualify a situation as negative (due to their fear), or they might be more sensitive to other people's comments and interpret them more readily as negative. On the other hand, since we feel that subjectively experienced seriousness of situations is of utmost importance, this argument seems irrelevant.

Vicarious learning was also more prominent in high fearful participants than in their low fearful counterparts. This finding indicates that high fearful individuals more often seem to have close family members or friends who have a problem with blushing than low fearful individuals do, which might result in more modelling behavior. Nevertheless, this finding might also be the result of a bias that high fearfuls might have towards detecting, interpreting or recalling (fear of) blushing in significant others.

The results with regard to informational learning differ between the studies. Using the written POQ, equal numbers of high and low fearfuls report having had informational learning experiences, whereas the oral POQ produces a significant difference between fearful individuals and control participants. The type of questioning might lie at the cause of this difference; however, assuming that the oral version is more accurate, high fearfuls again report more informational learning experiences. Here as well, one might suspect that high fearfuls selectively attend to, interpret and recall these types of experiences.

With respect to the potential differences in the pattern of results when using a written or an oral version of the POQ, it can be observed from Tables 1 and 2 that the percentages of conditioning, vicarious learning, and informational learning for both high and low fearful individuals are higher in study 1 than in study 2. Several reasons can be put forward to account for this difference. Firstly, differences in the level of anxiety between the groups in studies 1 and 2 might have resulted in differential reporting of negative learning experiences. However, the phobics *and* controls in study 2 had higher fear of blushing scores than the high and low fearful individuals in study 1. If anything, one would therefore expect participants in study 2 to report *more* negative learning experiences instead of *fewer*. Secondly, differences in the research populations with regard to age and level of education (university students versus a mixed group) might have accounted for these differences. However, that does not seem to be very plausible: the age differences were not huge (mean age of 20 versus 26), and the majority (70%) of study 2 consisted of university students, students of higher secondary education, and working individuals with a qualification from one of these kinds of education.

The above arguments lead us to conclude that the differences must be merely due to a

methodological aspect; one possibility is that a face-to-face interview (study 2) makes people reluctant to report potentially shameful experiences, compared to a written questionnaire taken anonymously. Another plausible explanation might be the fact that our interview had stricter rules, only assigning someone to a category when a specific memory with respect to that category could be reproduced. The written POQ provided no clue as to whether participants had in mind specific (CS–UCS paired) or general memories with regard to the questions. Therefore, in study 1, the occurrence of the several types of learning experiences with regard to blushing might have been overestimated. In line with this, Menzies and Clarke (1994) and Menzies et al. (1998) have concluded that the original (written) POQ might overestimate the presence of the several learning pathways to phobias. Note, however, that the percentages in our study cannot be compared to those in the study of Ös, and Hugdahl (1981), since our participants could be assigned to more than one category: Öst and Hugdahl (1981) made their participants attribute their phobia to only one learning pathway.

Taken together, it appears that individuals with fear of blushing more often have a history of negative learning experiences than control individuals. However, it remains to be investigated whether this is a result of *actual* differences in the occurrence of negative events, or differences in attention for, and in the interpretation of such events as negative, and/or recall for such events. Furthermore, although the relative pattern of results appeared to be equal across study 1 and 2, there are reasons to believe that the results of study 2 are more valid. Thus, to obtain a realistic picture with regard to the learning history in fearful individuals, the use of strict instruments is recommended.

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