Video Self-Modelling versus Video Peer-Modelling: The Effects on Symptoms and Self-Efficacy in the Fear of Spiders.

A thesis

submitted in partial fulfilment

of the requirements for the degree

of

Master of Science in Psychology

at the

University of Canterbury

by

Martin Hood

University of Canterbury

2004

ACKNOWLEDGEMENTS

There are a number of people without whom this thesis would not have been possible.

First and foremost my supervisor, Mr. Neville Blampied, for his continual support and helpful advice throughout the two years of this research.

Special thanks are also owed to Mr Glen Lewis, without whose great technical help, this thesis would not have been possible.

Many thanks also go to Mr Simon Pollard, for allowing me to film the spiders needed for the videos, and the Zoology girls for allowing me access to resources.

My appreciation is further extended to the people who participated in the study and put so much time and effort into watching the videotapes and coming to assessments.

Finally, thanks need to be given to my family and friends. To my parents for giving me everything, including the self-discipline to see through this project. To my partner, Rebecca Dowling for all her encouragement and the hours spent reading drafts. To my friend, Collette Woolcock, for supporting me both with my thesis and throughout the year.

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Abstract

The purpose of this thesis was to compare the effectiveness of video self-modelling to video peer-modelling in increasing self-efficacy in dealing with spiders and reducing spider phobic symptoms. For this study, 16 spider-phobic participants, aged between 19 and 38, were recruited from around the university. They were asked to complete questionnaires regarding their level of spider-phobic symptoms and beliefs; general anxiety and depression; generalised self-efficacy; and how their fear of spiders affected them in their everyday lives. They were placed into matched pairs primarily according to the severity of their phobic symptoms. They were assessed twice during a baseline period with self-report, physiological and behavioural measures. The treatment phase involved one member of each pair watching themselves on video coping well during spider encounters (self-modelling), and the other member watching a copy of the same video (peer-modelling). The treatment included seven exposures to the videos, and participants were required to record their subjective anxiety and self-efficacy each time. Immediately after treatment, the participants were assessed again, and then once more at six-week follow-up.

It was found that self-efficacy level and strength regarding spiders was enhanced more after self-modelling than after peer-modelling, although neither group showed any change in generalised self-efficacy. Participants who had undergone both types of modelling showed equivalent overall levels of reduction in avoidance on the behavioural measure, but self-modelling participants showed the most clinically significant improvements. The self-modelling group showed more reductions in phobic beliefs and self-reported symptoms. Changes in self-efficacy related closely to changes in phobic behaviour. Both groups showed variable changes in subjective anxiety and physiological arousal after treatment. It was concluded that, once a clinician acquired the skills and resources to utilise self-modelling, the findings of superior results compared to peer-modelling indicate that it could prove to be a useful component to include in therapy for phobias.

CHAPTER 1

1.1. Social Cognitive Theory

The most thorough account of the processes involved in modelling and social learning is to be found in the works of Bandura (1971, 1977, 1986, 1997). Departing from the views of pure cognitivism or behaviourism, Bandura proposed that people are not driven solely either by their thoughts or environments. He proposed that there exists instead a “triadic reciprocality” between cognitive factors, environmental factors and behaviour: all of these interact and determine the others. The strength of each of these influences varies depending on the situation and person.

Bandura (1986) characterises humans as having five core capabilities. They are (a) “symbolizing capability”, (b) “self-regulatory capability” (c) “forethought capability” (d) “self-reflective capability”, and (e) “vicarious capability”.

Symbolising capability refers to the ability to process experiences to form internal models that guide future action. This allows the testing of solutions and the estimation of outcomes before action is taken. The self-regulatory capability allows people to regulate their own behaviour according to internal standards.

The last three capabilities are particularly relevant to this thesis. The capability for forethought regulates most of one’s actions. Through forethought people set goals, plan courses of action and anticipate the consequences. Thus, forethought motivates and guides action.

The capability to self-reflect allows people to think about their own experiences and thought processes and develop beliefs about themselves and the environment. They verify and monitor these beliefs through ongoing self-reflection. According to Bandura, the beliefs people develop about themselves and the environment through the process of self-reflection affects their actions. He proposed that one of the most important types of self-reflective thought that affects people’s actions are judgments of their capabilities to deal effectively with situations, or their perceived self-efficacy. On the basis of one’s perceived self-efficacy, one decides what to do, decides how much effort to invest, chooses how long to persevere and approaches tasks anxiously or self-assuredly.

Finally, vicarious capability is that which allows us to learn by observing others’ actions and its consequences for them. According to Bandura, the majority of human behaviour is learned through observing other ‘models’ carry out behaviour. This has the advantage of efficiency, in that each individual need not have to undergo a process of trial and error. It is also useful for human survival, in that reliance on observational learning increases with more hazardous behaviours, where mistakes can be costly.

1.2 Observational Learning and Modelling

Observational learning involves cognitive and behavioural changes in the observer. It occurs through the process of modelling, which involves an individual (the model) illustrating behaviour that can be "imitated or adapted in the thoughts, attitudes or overt behaviours of another individual (the observer)" (Dowrick, 1991, p.65).

Bandura (1986) describes the process of social learning as a two-stage process. In the "response acquisition phase", the model transmits information to the observer, which the observer then symbolically codes and stores in memory. Modelled information is transformed into a representational guide to action. Models usually demonstrate specific examples of the new behaviour, but, in a process Bandura terms "abstract modelling", the observers extract the rules underlying the performance of those specific examples. They can then generate behaviour in situations that differ from the modelled instances. The "performance reproduction phase" occurs when the observer is presented with the appropriate cues. They recall the coded response and use it to guide their actions.

In the case of individuals experiencing chronic phobic anxiety, modelling of coping with a phobic object can have multiple effects on the phobic observer, it can (a) weaken inhibitions over phobic behaviour, (b) prompt the production of behaviour previously learned (c) enhance environmental factors, drawing the observer's attention towards particular objects in the environment, and (d) produce emotional arousal (Bandura, 1986).

According to Bandura (1986), the effect of modelling is governed by four processes: (a) attention, (b) retention, (c) motivation, and (d) production.

1.2 (a) Attention

Attentional processes determine which modelled behaviours are perceptually attended to and which information is extracted. The attention paid to a modelled activity is dependent on the properties of modelled activities themselves (e.g., they need to be salient and discriminable); the personal attributes of the observer (e.g., cognitive competencies, prior knowledge); the functional value (i.e., the observer must feel that the situation being modelled is personally relevant); and the attractiveness of the model (i.e., the model must be interesting or rewarding in some way).

Bandura (1986, 1997) states that the more similar the model is to the observer, the more personally relevant the modelled behaviour will be, and the more attention will be paid to it by the observer.

1.2 (b) Retention

The observer must remember the modelled activities if they are to be influenced by them. The information transmitted by the model must be transformed into symbols (conceptions, rules and propositions) and images to guide future action. Further rehearsal both cognitively and behaviourally increases retention.

1.2 (c) Production

This process involves turning symbolic conceptions into appropriate actions. The person must be physically and cognitively able to carry out the activity. During the production of the behaviour, careful guidance, monitoring and adjustment are conducted internally.

1.2 (d) Motivation

The behaviour is much more likely to be produced if the observer feels motivated somehow: in other words, there must be some reinforcement contingent on it, or, in the very least, an absence of punishment. According to Bandura, if the observer has paid attention to and retained the modelled information then learning has taken place. Whether they then perform the behaviour depends on incentives.

1.3 Self-Efficacy

Through our capacity for self-reflection we develop self-efficacy beliefs. According to Bandura (1997), one may possess all the relevant skills required for a behaviour yet still not behave optimally because of a lack of perceived self-efficacy. Self-efficacy is defined as “the strength of one’s conviction that he or she can successfully execute a behaviour required to produce a particular outcome” (Bandura, 1977, p.192).

For Bandura (1997), one's percieved self-efficacy is an all-pervasive influence in one's life:

> The striving for control over life circumstances permeates almost everything people do throughout the life course because it provides innumerable personal and social benefits…..The inability to exert influence over things that adversely affect one's life breeds apprehension, apathy or despair. (p.2)

Perceived self-efficacy has been shown to be linked to performance independently of ability (Locke, Frederick, Lee & Bobko, 1984). Bandura (1997) proposes some reasons about why this may occur, including:

1. Those with higher self-efficacy in a particular situation expect positive outcomes and may thus persevere longer, and attempt a wider range of strategies to achieve success than those with lower self-efficacy. These attempts, even if unsuccessful, build up component subskills for the behaviour and make success more likely in the future.
2. During actual and anticipated transactions with the environment, those with lower perceived self-efficacy may dwell on personal deficiencies, exacerbating their effect and spend less time thinking about how best to proceed. Those with higher self-efficacy put more attention and effort into strategies for success.
3. After failure, those with low perceived self-efficacy attribute the failure to a lack of skill, whereas those with high perceived self-efficacy attribute it to a lack of effort.

1.3.1 Sources of Self Efficacy

Bandura (1997) argues that people construct their self-efficacy beliefs from four principal sources of information: (a)verbal persuasion, (b) enactive mastery experiences, (c) vicarious experience, and (d) physiological state. This information is then selected, weighted and integrated into self-efficacy judgments during a process of cognitive appraisal. Each of the four sources has its own set of specific factors, or indicators, that is crucial to the influence the information will have on the person's appraisal of their abilities.

The last three sources of information, enactive mastery, vicarious experience, and physiological and emotional arousal state, all operate in the experimental intervention presented in this thesis.

1.3.1 (a) Enactive mastery experiences.

Bandura (1997) asserts that experiences of success or failure are the most influential source of self efficacy information. Bandura, Jeffery & Gadjos (1975) conducted an experiment with snake phobics. One group undertook a guided mastery intervention, one group received guided mastery and an additional hour of self-directed interaction with a boa-constrictor, and one group received no treatment. It was found that the group that had benefited from independent mastery experiences exhibited bolder behavior toward an unfamiliar threat, less fear arousal, less apprehension of snake encounters, and greater self-competency in coping with snakes.

According to Bandura (1997), the strengthening or weakening effect of these experiences on self-efficacy depends on the strength of pre-existing self-efficacy beliefs. If one has high pre-existing self-efficacy then failures are likely to be interpreted as a lack of effort. If one has persistent long-term low self-efficacy then one is more likely to distrust a new positive experience. This may be the situation for many people who have had a long-term phobia. In order for a therapeutic intervention to increase these people's perceived self-efficacy it may be necessary to produce very powerful confirmatory experiences.

Self-efficacy is also more likely to be strengthened if the task is difficult, achieved without external aid, and achieved with low effort. If high effort is expended under ideal conditions for maximum performance then failure signifies limited capacity much more than if only minimal effort was expended. The rate and pattern of attainments is also a significant indicator for cognitive appraisal: individuals who show steady improvements over time are more likely to show increases in self-efficacy than individuals who see their performance leveling off after previous improvement.

Self efficacy is also affected by biases in the self-monitoring of performances. People who selectively attend to and recall their best performances are likely to have enhanced beliefs of personal efficacy. Positive self-review self-modelling research provides evidence suggesting that self-efficacy is enhanced by such a selective positive focus.

1.3.1(b) Vicarious experiences.

Efficacy appraisals are also influenced by vicarious experiences. Individuals can form judgments of their own abilities by comparing themselves to the performances of others. According to Bandura (1977), vicarious experience is a less dependable source of information regarding one's own capabilities than personal accomplishments because of the fact that self-efficacy judgments will rely on inferences the person makes in the process of social comparison.

The greater the model's assumed similarity, the more persuasive the influence on the observer's self-percepts. If the observer observes a similar model perform successfully then "they persuade themselves that if others can do it, they too have the capabilities to raise their performance" (Bandura, 1997, p.87). Alternatively, seeing a model similar to oneself fail despite high effort decreases one's self-efficacy.

The observer must perceive the model to be similar on characteristics assumed to be predictive of performance capabilities, such as age, sex, educational and socioeconomic level, and ethnicity. Even though these are often overgeneralisations and spurious to performance, increased similarity on these characteristics increases the force of modelling influences (Rosenthal, 1978). Bandura (1997) noted that "similarity in age and sex to coping models emboldens phobic observers, although these characteristics do not really affect how well one can perform the feared activities" (p.404). When the model is oneself, self-modelling enhances the similarity of the observer to the model to the maximum possible degree: the observer *sees themselves* performing successfully.

Kazdin (1973) and Meichenbaum (1971) found that models who show the attainment of success by overcoming a challenge through determined effort are of more benefit to the observer than observing easy and faultless performances by experts. Bandura (1997) proposed that this was because setbacks are more likely to be seen as temporary and the observer develops the belief that success depends on effort and perseverance.

Bandura (1997) stated that modelling "provides clear information on how best to perform skills" (p.4). In the case of individuals suffering from phobias, models can teach observers effective strategies for dealing with the feared situations. Bandura (1986) asserts that self-efficacy is enhanced if the modelled performance emphasises the predictability (how the feared object is likely to behave), and controllability (strategies for handling threats): "what phobic thinking renders frightening, instructive modelling makes predictable and personally controllable." (p.405). Bandura (1997) stated that effective coping modelling can boost the self-efficacy of individuals "who have undergone countless experiences confirming their personal inefficacy" (p. 87) which may indeed be the case for many phobic people.

1.3.1 (c) Physiological and emotional arousal.

Bandura (1997) posits that people rely partly on their state of physiological arousal in judging their anxiety. Individuals will consider themselves less able to perform a task when they are tense and viscerally agitated. Anxiety then produces further anxiety through anticipatory arousal (Bandura, 1977). Thus, according to this perspective, interventions to increase self-efficacy should aim to lower anxious arousal in the performance situation.

1.4 Self-Efficacy Theory of Anxiety

Bandura (1997) defines anxiety as involving “anticipatory affective arousal that is cognitively labeled as a state of fright” (p.138). He acknowledges the possibility that people can increase their physiological and affective arousal through ruminations and worrying trains of thought. He proposes that thoughts about one’s coping efficacy are prominent in such self-arousing cognition.

Bandura (1997) argued that efficacy beliefs regulate affect through the individual’s beliefs about control over thought (attentional biases, construal of events, control of perturbing trains of thought), action (actions taken to lessen aversive potential of environment), and affect (amelioration of aversive emotional state once aroused).

According to Bandura (1997) perceived self-efficacy in controlling potential threats is central to anxiety arousal. Threat is not a fixed property of environmental factors, it “is a relational matter concerning the match between perceived coping abilities and potentially hurtful aspects of the environment” (Bandura, 1997, p.140). According to the theory, perceived self-efficacy regulates anxiety through attention (vigilance towards potential threats) and construal (how the threats are perceived and cognitively processed.) In contrast to two factor theory (Mowrer, 1950), social cognitive theory asserts that it is perceived inefficacy in coping with potential threats that causes both anticipatory anxiety and avoidance behaviour.

According to Bandura (1986, 1997) therapeutic interventions, whatever their form, serve as a means of creating and strengthening self-efficacy. Thus, the best therapeutic strategies for phobias involve not merely exposure and habituation to the phobic object, but experiences that develop coping capabilities. They build this sense of self-efficacy through the four principal sources of self-efficacy information previously mentioned.

The optimal intervention, according to Bandura (1997) is one he terms ‘guided mastery’ or ‘participant modelling’. This method combines the influences of direct mastery experiences and vicarious experiences. The therapist, sometimes along with other models, demonstrates the desired behaviour in graduated steps, and then the patient is guided towards successful performance themselves. This is done using “mastery aids” (or “response induction aids”), such as graduated subtasks of increasing difficulty (e.g., touching a snake with gloved then bare hands). Bandura, Jeffery & Wright (1974) showed that the more these aids are employed, the better the treatment results.

Bandura compared the effectiveness of interventions that employ modelling alone to the effectiveness of the guided mastery technique. Bandura, Blanchard & Ritter (1969) divided snake phobics into four groups: (a) control, (b) systematic desensitization, (c) symbolic (filmed) modelling (observing a film in which adults and children performed progressively more intimidating interactions with a snake), and (d) guided mastery. The percentages of each group able to perform the terminal approach task on the Behavioural Approach Test (BAT) after treatment were 92% for guided mastery, 33% for filmed modelling, 25% for systematic desensitization, and 0% for controls. Filmed modelling and guided mastery both effected decreased reported subjective anxiety to ratings of between 1 and 2 out of 10 during approach tasks, significantly more than the other two conditions.

Percieved control, Bandura (1997) proposes, “can cognitively transform threatening situations into safe ones” (p141). Sanderson, Rapee, and Barlow (1989) conducted a study whereby two groups of agoraphobics inhaled carbon dioxide-enriched air, which typically provokes panic attacks in this population. One group was told that there was no way to control the amount of carbon dioxide inhaled. The other group was deceived into believing that they could control the amount by adjusting a valve (which actually had no effect). In the perceived control group 60% fewer participants had panic attacks and the overall level of anxiety arousal was markedly lower. It is the individual’s belief that they can exercise control over aversive events should they choose to, rather than the actual application of control, that reduces anxiety (Glass, Reim & Singer, 1971; Gunnar, 1980; Gunnar-vonGnechten, 1978; Mineka, Gunnar & Champoux, 1986).

Bandura (1997) also proposed that a strong sense of coping efficacy regarding a phobic stimulus can make it easier to dismiss perturbing intrusive cognitions. He conducted a number of experiments which used enactive mastery experiences to build self-efficacy in severely phobic individuals (e.g., Bandura et al., 1975; Bandura, Taylor, Williams, Mefford, & Barchas, 1985;). The majority of the participants experienced intrusive thoughts and recurrent nightmares about snakes and spiders. Coping mastery experiences built coping efficacy and the chronic intrusive cognitions were eliminated in all the participants.

People also differ in their level of efficacy to allay anxiety through palliative means (e.g., self-relaxation, calming self-talk, recreation, social supports.) These have been shown to reduce anxiety (Rosenthal, 1993).

Some symptoms of anxiety disorders, argues Bandura (1997), result not from perceived inefficacy to control environmental threats but perceived inability to control oneself. During the construction of their Spider Phobic Beliefs Questionnaire (SBQ; Arntz, Lavy, van den Berg & Rijsoort, 1993) found that some phobics reported beliefs that they would lose control during encounters with spiders, attacking people or crying uncontrollably for example.

He presents evidence that regardless of the treatment technique used, “subsequent behavioural change is highly predictable from level of self-efficacy change” (Bandura, 1997, p.327). In a study by Williams, Dooseman & Kleifield (1984), agoraphobics were placed into control, exposure and guided mastery groups. Perceived self efficacy and percentage of coping tasks successfully performed were measured pre-treatment and post-treatment. There was a close match between the two measures across the three different conditions, with the greatest improvement in self-efficacy and performance in the guided mastery condition.

In other studies (Gauthier, Laberge, Freve & Dufour, 1986; cited in Bandura, 1997) phobics received equivalent exposure to the phobic stimulus, but were informed that the procedure was either imparting a full repertoire of coping skills, or that it was only imparting a portion of these skills, or measuring their current level of coping skills. Those who had had their efficacy beliefs raised higher by the alleged completeness of the treatment showed more improvement.

In a study by Bandura, Adams, and Beyer (1977), severe snake phobics received two different types of treatments (guided mastery and live modelling) and a control group received no treatment. Results showed that the two treatments both raised and strengthened beliefs of coping efficacy, although the modelling did so less than the guided mastery. There was a high level of congruence between the efficacy levels and performance levels across the modalities. Bandura (1997) concluded that "behaviour corresponds closely to level of perceived self-efficacy regardless of the method by which a sense of coping efficacy is instilled. The higher the level of perceived self-efficacy, the greater are the performance accomplishments" (p.335). A study by Bandura, Reese & Adams, (1982) replicated this finding both between groups and intra-individually.

Clark, Abrams, Niaura, Eaton, and Rossi (1991) showed that efficacy beliefs formed at different points in treatment for phobias predicted, with a high degree of accuracy, later coping success on tasks the participants had not attempted before. Williams, Kinney & Falbo (1989) found that efficacy beliefs were an excellent predictor of the pattern of generalized behaviour changes in a sample of agoraphobics after situationally localized treatment. Further, efficacy beliefs retained their predictiveness when anticipated panic, anticipated anxiety, perceived danger, maximal performance in treatment, and level of anxiety accompanying the behaviour were controlled for.

Bandura (1997) asserts that specific measures of self-efficacy in coping with phobic encounters are much more predictive of behaviour and affect than undifferentiated measures which provide no specific context in the questions. This is because these are too vague and do not provide the participant with situations to compare themselves with.

1.5 Self-Modelling

One treatment technique which is purported to produce improvements in behaviour by increasing self-efficacy is self-modelling (Bandura, 1986; 1997; Bradley, 1993; Dowrick, 1999;). Self-modelling has been defined by Dowrick (1999) as:

> An intervention procedure using the observation of *images of oneself* engaged in adaptive behavior. Most commonly, these images are captured on video, edited into 2-4 minute vignettes, and repeatedly reviewed to learn skills or adjust to challenging environments....[but] can also be produced on audiotape, in the

> imagination, through role-play, or in other narrative media such as still photographs arranged in a series. (p.23)

The viewer thus acts as their own model and can learn adaptive behaviours from these images of themselves performing at or even beyond the best of their capabilities.

Video self-modelling techniques optimise the attractiveness of the model to the observer because of the visual medium they are presented in. Interesting and rewarding models are sought out and paid attention to. Bandura (1986) noted that:

> Control of attention through attraction is perhaps nowhere better illustrated than in televised modelling…. Indeed, televised models can be so effective in holding attention that viewers learn the behaviour they depict regardless of whether or not they are given extra incentives to do so. (p.54)

Video self-modelling also provides richly detailed information about how to perform a behaviour. Bandura (1986) pointed out that it can be "difficult to convey through words the same amount of information contained in pictorial, filmed or live demonstrations." (p.72).

Perhaps the principle advantage of video self-modelling however, is that it allows the maximum possible similarity between observer and model. It has been argued that this is likely to have two effects: the observer is likely to pay more attention (Dowrick, 1999) and the observer should have their self-efficacy enhanced more than if they watched a different person carrying out the desired behaviour (Bandura, 1997; Dowrick, 1999).

Some have argued that self-modelling is unequalled with regard to the degree of observer identification from both a cognitive and affective perspective (Hosford, 1981). Self-modelling often succeeds where other instructional, modelling and incentive approaches fail (Bandura, 1997; Dowrick, 1991; Meharg & Watelsdorf, 1990). Bandura (1997) noted that "apparently, it is hard to beat observed personal attainment as a self-persuader of capability" (p.94).

Thus, the video self-modelling intervention is a powerful combination of the attention getting audiovisual medium with a model of optimal similarity to the observer providing distinctive information about how to perform a task appropriately.

The optimal enhancement of self-efficacy is most often proposed as the factor that produces successful performance during self-modelling (Bandura, 1986; 1997; Bradley, 1993; Kehle, Bray, Margiano; Kehle and Gonzales, 1991; Theodore, & Zhou, 2002). Bradley (1993) examined the effect of positive self-review self-modelling on basketball free-throw performance. The positive self-modelling group performed at a higher level than the control group and the negative self-modelling group that observed only their own poor performances. He did not find a significant difference in self-efficacy level however, an effect he ascribed to the measure used. Self-efficacy strength was, however, significantly enhanced on every trial. The correlation between self-efficacy strength and performance was r=0.689. Holman (1991) found that video self-modelling enhanced swimming performance and self-efficacy strength significantly more than a control group ($p<0.05$). Significant correlations were also found between swimming speed and self-efficacy strength ($p<0.005$).

A wealth of data exists to prove that a close relationship exists between self-efficacy level and performance during peer-model interventions (e.g., Bandura et al., 1982). Further, observational learning studies indicate that behaviour change is enhanced by model similarity (Dowrick, 1983; Kazdin, 1974). Thelen, Fry, Fehrenbach, and Frautschi (1979) also found that the greater the extent to which one identifies with a model the greater the bearing on whether or not one chooses to imitate them. Self-modelling according to social cognitive theory, should be more effective than peer-modelling because the observer does not have to make inferences during social comparison. Therefore self-modelling should produce greater increases in self-efficacy than peer-modelling and performance should closely follow enhancements in self-efficacy level and strength. As it relates to phobias, social cognitive theory predicts that these greater increases in self-efficacy after self-modelling should lead to less avoidance (or more success on approach measures) and less anxiety. There have been no studies to specifically address this question so far.

Although some studies have found self-modelling to be more effective than peer-modelling (e.g., Dowrick & Hood, 1978; McCurdy & Shapiro, 1988), some studies have found no consistent support for the use of self-modelling (Clark et al., 1990; cited in Clark, Kehle, Jenson and Beck, 1992).

Clark et al. (1992) theorised that certain factors may affect the success of the intervention. They suggested that it may not be as useful with preschoolers. This may be because “behavior changes associated with self-modelling would seem to be a deliberate and purposeful enterprise” (p.247), and that the young child’s “self-awareness and capacity to use goal-oriented approaches to actively attend, think, learn and subsequently act” (p.247) may not be developed enough. They also suggested that some behaviours are more difficult to treat using self-modelling, e.g., teaching someone to emit a behaviour may be easier than teaching them to withhold one.

Clark et al. (1992) and others, have noted the positive aspects of the intervention, including (a) the high interest value of participants, (b) its unobtrusive and nonrestrictive nature, (c) the ease of use of the video for the participant, (d) its flexibility in that the participant can view the tapes anytime and have ‘booster’ viewings after the initial treatment, (e) the reliability in the implementation of the intervention, as it does not rely on parents or teachers to carry out elaborate behavioural procedures, and (f) the low amount of professional time and patient time taken once the videos are made.

Clark et al. (1992) do however caution that in constructing an acceptable videotape showing only desirable behaviours, it can be difficult to both choose which behaviours to edit out, and to gain access to and knowledge of recording and editing equipment. In the case of “feedforward modeling” (discussed later), the additional problem exists of producing images of the previously never exhibited target behaviour.

Recently, Dowrick (1999) has suggested that the observation of one’s behaviour should be considered to be “a learning mechanism in its own right, not a special case of observational learning from others” (p.36). He proposed that the task of psychologists now is to ascertain the various factors which make the desired behaviour change more likely. The most obvious factor, according to Dowrick, and supported by social cognitive theory, is that the target behavior must be valued by the observer.

In addition, Kehle et al, (2002) proposed that the learning mechanism at work in self-modelling which enhances performance may be one which changes “the individual’s memory of the performance, or nonperformance of the target behavior” (p.204). They cited research which showed that false memories can be induced in participants, and that this can lead to behaviour change (Braun & Loftus, 1998; Loftus, 1997). There is, as yet, no experimental evidence to support this contention so far however.

This conception does seem to be at odds with the assertion made by Clark et al., (1992) that learning from self-modelling seems to be a “deliberate and purposeful enterprise” (p.247). Dowrick (1991) stated that “the procedure is best presented as a straightforward depiction of potential future behavior, not a bogus past” (p.117). He asserted that deception or ‘false feedback’ is a different and inferior technique to self-modelling. He stresses the value of client participation, citing evidence that shows that when participants are involved in selecting the feedforward images they want results can be very impressive (Maile, 1985, as cited in Dowrick, 1991).

Although the issue of causality is not addressed in this thesis, the controversy over the exact nature of the learning mechanism at work in self-modelling is likely to become the subject of much future research in the area.

1.6 Video Self-modelling

Many of the studies incorporating self-modelling interventions have used video self-modelling. Dowrick (1991, 1999) has drawn the distinction between two types of self-modelling within this medium: positive self-review modelling and feedforward modelling.

1.6.1 Positive Self-Review (PSR) Modelling

In positive self-review interventions, people who have a deficiency in a skill or coping ability are recorded performing the target skill at their maximum possible level. This performance is produced with aids such as rehearsal and incentives. The errors and non-target behaviour are then edited out to produce a short tape showing “fine tuned examples of the best the individual has been able to produce thus far” (Dowrick, 1999, p.25). These tapes show authentic performances and require less editing than the feedforward technique.

In a review of self-modelling interventions, Dowrick (1999) discussed four different categories of PSR interventions that have appeared in the literature to date:

1) Improved image for mood-based disorders;
2) Transferring role-play to the real world;
3) (Re)engagement of disused or low frequency skills; and
4) Increasing adaptive behaviour currently intermixed with non-desired behaviours.

These interventions have met with a good deal of success and Dowrick's (1999) review presents examples which highlight the broad range of populations and situations these techniques can be applied to.

Category four, Dowrick (1999) argues, occurs the most frequently in the self-modelling literature. An example of one of these studies is a study by Hosford, Moss & Morrell (1976). The study involved recording an audiotape of a prison inmate who stuttered. The researchers recorded counseling interviews and asked him to speak about a variety of positive and negative experiences in his life. His stuttering varied between topics, with less stuttering recorded when he talked about positive experiences. The tape was then edited to remove dysfluencies. He was then asked to listen to the tape for at least three hours per week and to practice daily talking fluently. Over the twelve-week counseling period his stuttering decreased from 8.7 times a minute to 0.8 times per minute. At three-month follow-up no increase in stuttering was observed. The authors noted, however, that the results may not have been solely attributable to the self-modelling technique as some sessions included relaxation training and systematic desensitization, and, of course, some of the improvement was likely to have occurred because of the daily practice.

1.6.2 Feedforward Modelling

Whereas the term feedback refers to information about current or recent performance, feedforward self-modelling depicts “skill(s) not yet acquired or not previously demonstrated in a challenging context” (Dowrick, 1999, p.25). Feedforward self-modelling tapes depict the participant’s ideal future, usually showing skills the individual already has, but shown in a new context or combination, i.e., they show behaviours that have never been carried out by that person. These tapes require more editing to combine component skills and appropriate backgrounds together into continuous scenes but have the potential to produce “much greater behaviour change than PSR” (Dowrick, 1999, p.36.)

Dowrick (1999) provides examples from four different categories of feedforward self-modelling:

1) Transfer of setting specific behaviour to other environments;
2) Use of hidden support for disorders that may be anxiety based;
3) Recombining component skills; and
4) Transferring role-play to the real world.

Further discussion of the area of feeforward self-modelling is undertaken below as the intervention presented in this thesis is an example of this procedure.

1.6.2 (a) Transfer of setting specific behaviour to other environments.

Sometimes people can perform a behaviour perfectly well in one setting, but are unable to do so in another. A good example of this is in the disorder of selective mutism. The DSM-IV (American Psychiatric Association, 1994) describes the essential feature of this disorder to be “the persistent failure to speak in specific social situations (e.g., school, with playmates) where speaking is expected, despite speaking in other situations” (p.125). The proposed enhancement in self-efficacy seems to be particularly important in selective mutism, as daily exposure to peer models does not produce speech in these children.

There have been a number of case studies reporting the use of self-modelling treatments for selective mutism. In some of these case studies a child who speaks freely at home would not talk at school, thus the mutism is setting-specific. One approach that has been used is to make a recording in the child's home, with the interviewer out of sight, and 'props' in the background, so as to simulate the class environment. This was then edited together with classroom scenes of the teacher asking the child a question, to create feedforward tapes, with the child appearing to speak in class (Dowrick & Hood, 1978).

In other cases, children have been disinhibited to talk when a significant person, usually a parent, is present. In these cases the mutism is person-, not setting-, specific. Here, the recording can be done in the school setting, and it is often enough that the parent is present, yet out of the view of the camera. The feedforward video depicts the child talking freely in class, without any parental support (e.g. Kehle, Owen & Cressy, 1990).

Dowrick and Hood (1978) created video self-modelling tapes in the treatment of two selectively mute children that had not responded to reinforcement schedules in the classroom. This was because of two factors that often prove problematic in behavioural and operant interventions: other children would compensate for the children's muteness, by answering on their behalf, and school staff were not adequately trained, and did not have the time, to consistently apply the reinforcement contingency. Although the children (a boy, Travis, aged 5 ½, and a girl, Sara, aged 6) were never observed to speak at school, they both talked quite freely at home.

The strategy involved taking some classroom equipment (wall charts and books) into the children's homes and they were filmed making responses to the interviewer's questions in front of this 'backdrop' (with the interviewer out of the picture.) A scene was then shot of the interviewer asking the same questions in the class, and the children's answers edited into this. Before the children were shown their tapes, two weeks of baseline measures were recorded, where both children showed a negligible level of verbalisations in class. In each phase, the 2-minute films were viewed on four occasions, on alternate days, by both the children together. Sara's film was shown for the first four sessions, and Travis's film for the next four, thus each child alternated between phases of self-modelling and peer-modelling.

Sara showed a modest increase in verbalisations on one of the days in the first phase of exposure to her self-model. Travis showed no change after watching the peer-model video. In the second phase, immediately after his first exposure to his self-model tape, Travis showed a very marked increase in speech (producing about three times as many verbalisations in the observation sessions). Sara, on the other hand, showed no increase after watching the peer-model tape in this phase. This was a very clear demonstration of the differing impacts of self versus peer-modelling in changing behaviour. The next phase was Sara's second self-modelling exposure. This time she did show an increase in speech, although less marked than that of Travis. He showed no real change in this phase (again, repeating the difference in self versus peer-modelling in modifying behaviour.) The final phase produced a further increase in Travis' speech after observing himself on video, and again no change in Sara's speech.

At follow-up 6 months later, after just two phases (eight viewings) of their self-modelling tapes, both children showed increases in the amount of speech in the classroom. Sara increased to answering 9 of the 10 activity related questions asked in the observation period, and Travis answered all of them, and would make many more spontaneous verbalisations in the observation period. These results also generalised to the observations of speech in the playground, although this was more anecdotal than formal observational evidence.

In this case, the comparison of self and peer video modelling clearly showed the effectiveness of self-modelling, but a negligible difference after peer-modelling. The children did not lack the component skills to perform the required behaviour (speaking in class). This is because they talked at home and they were also already surrounded by a variety of peer models in the classroom everyday, who talked freely. Therefore, Dowrick and Hood (1978) concluded that the children lacked the self-belief that they could successfully talk in the classroom, thus supporting Bandura's (1997) assertion that therapeutic change occurs in self-modelling because it increases self-efficacy. Selective mutism, from this evidence, seems to be a disorder where the person lacks the self-belief, but not the required skills, and a self-model is more effective than a peer model in treatment[1].

1.6.2 (b) Use of hidden support for disorders that may be anxiety based.

This category of self-modelling techniques in Dowrick's (1999) classification system is actually the same method that has been used to create the tapes in some interventions with selective mutism. Sometimes a person can cope with a situation if there are emotional or physical supports present. If these are placed off-camera it can be made to appear as if the person is coping by themselves. Dowrick (1999) noted that although

[1] The authors advanced no explanation as to why the two subjects should show quite different level of responsiveness to the self-modelling treatment. Clark et al. (1992) have suggested that differences in levels of imitative propensity in children might produce differing results after self-modelling.

anxiety is often implicated or cited as the target of the therapy, it is rarely formally measured in these studies.

A very good example of this type of intervention was demonstrated by Dowrick and Dove (1980). It involved the experimenters developing mastery video-tapes showing three children with spina bifida confidently swimming in a pool. These children were paralysed from the waist down and immediately felt anxious in the water. Although quite capable of swimming using their upper body strength, most of the time at the pool was taken up with the therapist trying to reduce their anxiety about the water. The authors produced feedforward tapes using the physical support of the therapist out of view of the camera (supporting them underwater). After the children viewed themselves performing mastery swimming skills on the tapes the time needed to coax them into the water was minimal. Although the effect of the intervention was to reduce anxiety and avoidance of the water, no specific measures of anxiety were taken, the main outcome variable instead being the number of swimming behaviours achieved.

Another study falling under this category was conducted by Houlihan et al. (1995). The authors intervened to increase the community involvement of a profoundly intellectually disabled man. He had recently had several visits to the hospital for relatively invasive medical procedures. He found these very aversive, requiring up to six people to restrain him, and experiencing nausea, vomiting and lethargy concomitant with each medical appointment. He had developed a conditioned fear of the van used for these medical visits and had started refusing to go on all outings, even when these would involve strong positive reinforcers for him.

The experimenters noted that video peer and self-modelling are very limited in their intrusiveness and can provide a high level of information to participants with limited learning potential. These pragmatic benefits combined with the low cost of the interventions made it ideal in this case. They reasoned that the observation of these tapes would decrease his anxiety and inhibitions regarding the van and outings by educating him about what he could expect to do on the outings (i.e., shopping, banking, and going out to eat.)

The ABACD design started with a retrospectively reported baseline phase of eight months. During this, the participant had taken part in 17% of outings. During this phase, peer-model tapes were constructed, depicting the staff and peers going in the van to the shops, the bank, or a restaurant, performing the activity, and coming home. Rewards were shown in the video, such as praise and reinforcers.

The second phase involved the participant being exposed to the peer video before an opportunity for an outing. During this phase, he went on 55% of the outings, showing that, in this case, peer-modelling was quite effective in increasing target behaviour. A nine month baseline followed, in which he ventured out on only 10% of the available opportunities. Following this, the therapists returned to the facility and he spontaneously started volunteering to go on outings again. The authors assumed that this was because their presence had become a discriminative stimulus for participation in outings, due to the fact that they were present in the peer-modelling phase. With the supportive presence of the authors, he was filmed going on the three types of successful outings. The last phase then involved exposure to the self model tapes in place of the peer model tapes prior to opportunities for outings. During this phase, he left the facility 78% of the time, the last month increasing to nearly 100%, showing an added effect over the peer-modelling intervention.

1.6.2 (c) Recombining component skills.

Some of the most impressive demonstrations of feedforward self-modelling in this category have been in the field of sports. Dowrick (1999) provides a good review of these studies and therefore they will only be lightly touched upon here. Dowrick (1999) reported the technique used to help a 14-year-old girl perform a gymnastics routine successfully. Different elements of the routine were filmed separately (e.g., the run-up, the flip and twist, the landing) and edited together.

Similarly, Franks & Maile (1991) reported the application of the technique to the Eskimo roll in kayaking, the triple lutz in figure skating, volleyball skills, and juggling skills. Maile (1985) reported a similar intervention to improve the performance of a national-level female powerlifter. She was filmed loading weights onto the bar that she had not successfully lifted before, and, separately, completing training lifts (zoomed in enough so that the weight was not shown) wearing the same attire and in competition conditions.

The results were an improvement of 26% over 25 weeks which was a level of improvement far in excess of what would normally be expected at that elite level.

1.6.2 (d) Transferring role-play to the real world.

One of the first empirical investigations of self-modelling to appear in the literature is a study conducted by Creer and Miklich (1970). The authors used a self-modelling technique to treat a 10-year-old boy they called Chuck. Chuck was a resident of a treatment centre for chronic asthma who displayed immature behaviour around adults and socially isolating behaviours around his peers.

In the initial two-week baseline period, the experimenters observed Chuck's behaviour to identify the "inappropriate behavioural chains" (Creer & Miklich, 1970, p.91) to be targeted. Following this, they asked Chuck to rehearse and role-play the scenes to appear on two different tapes. One tape showed Chuck acting inappropriately (e.g., having a temper tantrum after being assaulted by two boys, or jumping into the lap of an adult) and one showed appropriate behaviour (e.g., physically defending himself from the boys, and interacting appropriately with an adult.) After filming, 2 weeks elapsed before Chuck was exposed to the tapes. This was to determine whether role-playing the scenes had any therapeutic effect. No change in Chuck's behaviour was recorded in this phase. The researchers then exposed Chuck to the 5-minute appropriate behaviour self-model tape for two weeks. At the beginning of this phase he abruptly began to exhibit appropriate behaviour which continued for the rest of the phase. For the following 2 weeks, Chuck was exposed to his inappropriate behaviour tape, and his actual behaviour sharply changed, reversing back to the typical behaviours observed during baseline. The final phase exposed him once again to the adaptive model tape and Chuck again started to display appropriate behaviour, which continued for the remaining 6 months of his stay at the treatment centre.

This early foray into self-modelling demonstrates the effectiveness of using role-play to create images of the participant performing at a level that they are actually unable to reach at the time.

1.7 Video Self- Modelling and Phobias

A specific phobia is defined in the DSM IV (American Psychiatric Association, 1994) as a marked and persistent fear that is excessive or unreasonable, cued by the presence or anticipation of a specific object or situation. The person almost invariably undergoes an immediate anxiety response upon exposure to the phobic stimulus and they avoid it or else endure it with intense anxiety and distress. They recognize that the fear is excessive or unreasonable.

Of all the anxiety disorders, specific phobia is the most common with an estimated lifetime prevalence of 10-11% (American Psychiatric Association, 1994). Among the specific phobias, it seems that spider phobia is the most common in this population (Bourdon et al., 1988).

Although no video self-modelling interventions have yet been targeted at the treatment of phobias there is some suggestion in the literature that they could be used successfully in the treatment of anxiety and avoidant behaviours. Two of the studies described above (Dowrick & Dove, 1980; Houlihan et al., 1995) showed the use of the hidden support technique to develop feedforward tapes which elicited reductions in anxiety. Anxiety was not measured in either of these studies however, with the dependant measures instead being the successful performance of the target behaviours.

One study to specifically address the reduction of anxiety using self-modelling was conducted by Kojian (1992). Kojian used a technique called ‘biblio-self-modelling’ to reduce dental anxiety in children, in a multiple baseline across-subjects design. This technique exposed the participant to appropriate target behaviours via a short story, in which they are the protagonist. The story, tailored to each of the three children, depicted them thinking, feeling and acting appropriately while at the dental clinic. The children read the story once before undergoing a dental procedure and measures were taken of heart rate and subjective units of distress (SUDS). In addition, behavioural observations were conducted by the dentist (who was unaware of who received and did not receive the intervention) to measure disruptive behaviour.

The self-modelling intervention did not result in decreases in heart-rate and SUDS over controls, but reduced the amount of disruptive behaviour. Kojian (1991) proposed that a limitation of the effectiveness of the treatment was that the children were exposed only once immediately before the anxiety provoking situation, whereas previous self-modelling studies employed multiple exposures over several weeks and 'booster viewings' could be administered at later intervals with ease (e.g. Creer & Miklich, 1970; Dowrick & Dove, 1980). It seems possible also, in accordance with the assertions of various researchers mentioned earlier (Bandura, 1971; Dowrick, 1999), that biblio-self-modelling lacks some of the benefits that the video medium provides.

In choosing biblio-self-modelling over video self-modelling, Kojian (1991) cited pragmatic difficulties in developing a feedforward tape, including the child not wanting to even enter the dental clinic to shoot the footage, the difficulty of viewing a self-modelling tape prior to the dental procedure, and the expense of the technical equipment required.

Even given these limitations, video self-modelling is potentially an extremely successful treatment for phobias and other anxiety disorders. There have been some indications that it is effective in reducing anxiety and avoidance, but as yet no self-modelling intervention via video has been targeted specifically at these two outcome measures. Thus, there exists a need to investigate the efficacy of this intervention technique in reducing anxious and avoidant symptoms present in individuals with phobias. Due to the relative ease of recruiting a spider phobic sample for such a study; the debilitating effects of a severe level of phobia in these individuals; and the suitability of the phobic object to creating approach scenes which could be manipulated using video techniques; the decision was made to target a self-modelling intervention at reducing the behavioural inhibition and anxiety responses in people with this disorder.

1.8 Existing Treatments for Spider Phobia

The number of people with such a condition makes it relatively easy to recruit people for studies and many advances in clinical practice have come from such research. Spider phobia has been investigated by many researchers and some very effective treatments have been developed. In assessing the clinical utility of a self-modelling intervention for spider phobia, one must compare it to the current best treatments available. The intervention for spider phobia which has shown the best results in terms of minimal treatment time and maximum reduction in phobic avoidance and anxiety is a one-session treatment technique reported by Öst and his colleagues, which is essentially an accelerated version of Bandura's guided mastery or participant modelling technique.

1.8.1 One Session Treatment for Spider Phobia

Öst's (1989) therapy differed from traditional exposure and desensitisation *in-vivo* because the patient progresses through the whole hierarchy in one massed session. The exposure is augmented with modelling by the therapist to encourage the patient to progress, thus showing similarities to Bandura's guided mastery technique. Three important criteria for treatment outline by Öst (1989) are that (a) the phobia must be circumscribed and only concern one specific situation or object, (b) the client is motivated enough to get rid of their phobia (and tolerate anxiety during the process), and (c) there are no reinforcing consequences if the phobia is maintained. In the case of spider phobia, he asserts that the aim is to get the person to be able to trap a spider with a glass and a sheet of paper and throw it out. In order to make long-lasting changes however, a large amount of ‘overlearning’ is desirable. The patient should be extended beyond the treatment goal for a time. Thus, “I want…a spider phobic to have one or two spiders walking around on… [their] hands for a while”(Öst, 1989, p.2).

Öst (1989) describes the therapy as involving the therapist first modelling coping during interactions with the phobic object, and then the patient gradually approximating towards physical contact with it. The therapist then gradually decreases their presence in the room until they can leave altogether.

Öst (1989) reported results from 20 patients with a variety of phobias (blood-injury-injection, spider, rat, cat, dog and bird phobias). The average treatment time was 2.1 hours, and the spider phobics reduced their self-reported scores by 67%. At 4-year follow-up, by means of a clinical interview, 65% of all the patients were assessed as completely recovered, and 90% as maintaining a clinically significant improvement. Notable by its absence in this report was a behavioural measure of phobic avoidance.

Öst, Salkovskis, & Hellstrom, (1991) explored comparisons between one session treatment and manual-based self-exposure treatment. Each group had 17 people with spider phobia randomly assigned to them. Therapist-directed exposure lasted a maximum of 3 hours. Four or five spiders of different sizes were used and each step was modelled by the therapist. The session ended when the patient could handle all the spiders with a SUDS rating of less than 30. The session was videotaped, in a video feedback self-modelling exercise. Thus, the patients were able to remind themselves about what they were capable of during treatment. The self-directed exposure group conducted their own treatment for 4 hours, following the steps in a 30-page manual detailing the procedures of the therapist-directed exposure.

There was a significant difference between the two groups. The researchers set a conservatively high level of achievement as representing clinical improvement. This included lying two standard deviations in the direction of functionality away from the patient group's pre-treatment average on the clinician rating scale, and on the subjective rating of anxiety scale, as well as achieving the final step in the BAT (holding a spider on the hand for 20 secs). According to this standard, 71% of the therapist-directed group achieved clinically significant improvement, compared to only 6% of the self-directed group.

This deficiency in the self-directed group was not due to the patients not exposing themselves to spiders, most did so for the required length of time. It is possible, the authors note, that therapy needed to continue for longer (perhaps 8-10 weeks). It seems likely that the modelling component, missing in the self-directed group, may be responsible for a good degree of the progress seen in the therapist-directed group. The authors also noted that, in their opinion, the cognitive component of the guided exposure treatment was also very important: “the most important factor in the one-session treatment is making explicit the patient’s catastrophic thoughts and devising the exposure situation in such a way that these can be tested out” (Öst et al., 1991, p.421). This is in accordance with Bandura’s (1997) claim that exposure alone produces smaller increases in self-efficacy and decreases in phobic behaviour than mastery experiences. He proposes that during exposure explicit instruction needs to be provided about how to control and cope with the threats.

Öst (1996) summarized the results of a series of studies (Hellstrom & Öst, 1995; Öst et al., 1991; Öst 1996) to show that at follow-up, 100% of patients in the individual therapist-directed one-session treatment group achieved the very stringent conditions for clinically significant improvement, compared to 96% of the small group patients (group size was three to four people), and 75% of the large group patients (group size was seven to eight people). The success of individual and small-group one-session treatments, together with the small time commitment required has led Öst, Ferebee & Furmark (1997) to tentatively conclude that these are the treatments of choice for spider phobia.

1.8.2 Modelling Interventions

The excellent results achieved by Öst and his colleagues are in line with Bandura’s (1997) assertion that enactive mastery or performance accomplishments are the most influential ways to enhance one’s self-efficacy, which will then produce performance enhancements. These are bolstered by the modelling by the therapist, as shown by Öst et al. (1991) to produce much better results than exposure alone.

As discussed earlier, several studies by Bandura and his colleagues (e.g., Bandura et al., 1977; Bandura, Blanchard, & Ritter, 1969) have found that interventions which used solely live or filmed modelling influences did not raise self-efficacy or target behaviour in snake-phobics as much as a guided mastery intervention. This finding has been replicated in spider phobic samples by Öst et al. (1997) and Goetestam (2002).

Öst et al. (1997) compared one-session treatment with live and filmed modelling for spider phobia. The modelling groups observed (directly or on videotape) an individual being treated with the one-session treatment method. Two groups of eight participants were placed into each condition. The direct treatment produced the best results overall, with filmed modelling producing better results than the live modelling condition. It was found that the overall change in level of performance on the BAT and self-reported anxiety were not significantly different between the one-session group and the filmed modelling group, although the changes in self-efficacy level and strength were approximately 15-20% higher in the direct treatment group. The proportion of each group that met Öst's strict criteria for clinically significant improvement at follow-up were: 75% (direct treatment); 44% (filmed modelling); and 14% (live modelling). Öst et al. (1997) reported that:

> A number of participants in the… [live-modelling] condition said that various steps in the treatment lead to a marked anxiety arousal that did not have time to abate before the next step was introduced. Thus a fairly high anxiety level was

> followed by another increase in anxiety, which made it difficult for the patients to focus on the treatment and learn from it. (p.731)

This may have made accounted for the poorer results. The video modelling never produced the same levels of anxiety in observers.

The authors noted that the video modelling results could have been improved by showing multiple models, displaying various types of catastrophic thoughts throughout the video, and commentary by the therapist.

Bandura & Menlove (1968) examined some of the factors involved in the success of filmed modelling in decreasing children's phobic avoidance of dogs. Three groups of children were exposed eight times to either a single peer model interacting with one dog; multiple models (girls and boys of varying ages) interacting with different types of dogs; or a control film. It was found that the children in the two modelling conditions performed equally well at post-treatment, increasing their mean approach scores to enter an enclosed pen with the dog, however the multiple model treatment produced additional increases at follow-up as well. They also found that, on average, observers who were more susceptible to anxious arousal during the exposures to the films benefited less from the modelling intervention.

In an effort to determine the relative contributions of the different components of the guided mastery treatment, Blanchard (1970) found that modelling accounted for approximately 60 % of behaviour change and 80% of changes in attitude towards the phobic object and fear arousal; guided participation contributing the remaining increments.

A different approach was taken by Goetestam and Berntzen (1997). Participants were put into pairs, with one member receiving direct one-session exposure to the feared animal and one member observing the treatment. Substantial gains were made by each observer at the conclusion of the other participant's treatment. The observer was then given some additional direct exposure, after which the treatment goals were reached after 15 minutes, as compared to 1.5 to 2 hours for the first patient. A follow-up approximately 8 years after treatment showed enduring effects.

Shaw & Thoresen (1974) found video modelling combined with imaginal self-modelling to be superior compared to systematic desensitisation in alleviating anxiety and avoidance in dental phobia. The modelling group observed three models (two of predominantly similar age and sex) undergo dental procedures on video, and then were instructed to imagine themselves in the model's situation for 20 seconds until they reported minimal subjective anxiety ratings. The average treatment time was 2 hours less, and self-report measures showed superior results than the systematic desensitization group. The behavioural measure was the achievement of a successful trip to the dentist to complete dental work. 78% of the modelling group achieved this, compared to 44% of the desensitization group.

Successful results were found by Fryrear & Werner (1970), who administered relaxation and video peer-modelling to a participant afraid of performing dissections on animals. The participant was able to perform various dissections with minimal anxiety after seven exposures to the video.

Similarly successful results were reported by Hill, Liebert & Mott (1968). A group of preschool-aged dog phobics observed two video peer models interact with a large dog. Eight of the nine boys in the modelling group were then able to approach, pet and feed a live dog, compared to three out of nine in the control group.

Thus, the results vary from moderate to complete success after video peer-modelling for various phobias.

1.9 Rationale for the Current Research

Although the research shows that mastery experiences produce superior results to vicarious experiences in treating phobias, video peer-modelling has also been shown to be moderately effective. The limited amount of evidence from studies comparing video self-modelling to video peer-modelling show that video self-modelling seems to be more effective in reducing anxious avoidance. Video self-modelling may therefore hold promise for the treatment of phobias, perhaps as an adjunct to exposure treatments, or as the principal source of therapy when exposure is not possible or suitable.

As yet, there have been no studies to systematically investigate the effectiveness of video self-modelling for phobias. In addition further research is needed to examine the question of whether self-efficacy strength and level are enhanced after self-modelling and whether self-modelling produces superior results to peer-modelling.

1.9.1 Hypotheses

In this study, video self-modelling and video peer-modelling interventions are applied to phobic participants in an attempt to decrease anxiety and avoidance. Spider phobia was chosen as a model phobia to investigate the effectiveness of the two interventions. No performance-based reinforcement was depicted in the videos or given extraneously. There was also no commentary during the scenes.

Primarily, the study aimed to (a) extend the research on video self-modelling into the field of phobias and to specifically measure the outcomes in anxiety and distress, avoidance, and general spider phobic symptoms and beliefs; (b) provide empirical evidence that self-efficacy strength and level are enhanced during video self-modelling; and (c) compare peer to self-modelling.

The hypotheses of the study were that :

1) Both interventions would produce increases in self-efficacy level and strength, but video self-modelling would produce greater increases than video peer-modelling;

2) Both interventions would produce decreases in avoidance as shown by increases in performance on the approach measure, or BAT, but self-modelling would show greater increases on this measure than video peer-modelling.

3) Both interventions would produce decreases on self-report measures of spider-phobic beliefs and symptoms, but video self-modelling would produce greater decreases than video peer-modelling.

4) Generalised self-efficacy would not change as a result of either intervention.

5) Changes in self-efficacy strength and level would closely relate to changes in performance on the BAT during each intervention.

6) Both interventions would produce decreases in self-reported anxiety (SUDS) and physiological indicators of anxiety (HR), but self-modelling would produce greater decreases than video peer-modelling.

1.10 Choice of Spider Phobia Questionnaires

The choice of questionnaires in this study was extremely important. Since clinical interviews to assess whether participants met the criteria for specific phobia were not possible, the questionnaires measuring the participant's fear of spiders were the primary method of separating those who suffered symptoms approaching the clinical range for spider phobia from those who did not. The positive aspect of this was that there were clear and replicable inclusion criteria. The measures also needed to show self-reported change that resulted from the modelling interventions. Thus, for both of these reasons, they needed to be particularly sensitive and reliable.

1.10.1 The Spider Phobia Questionnaire SPQ; (Klorman, Weerts, Hastings, Melamed, & Lang, 1974)

The most commonly used questionnaire in the literature is the Spider Phobia Questionnaire (SPQ; Klorman et al., 1974). It consists of 31 true-false questions and has high internal consistency (Johnsen & Hugdahl, 1990); is able to differentiate between phobic and non-phobic persons (Fredrikson, 1983); and has been used in many studies (e.g., Merckelbach, de Jong, Arntz, & Schouten, 1993, Öst, 1978). Some authors have reported low test-retest reliability for the SPQ (Packer, Bond, & Siddle, 1987) but others have reported good stability in scores over time (Muris & Merckelbach, 1996).

The questionnaire was developed in 1974 so it seemed conceivable that, despite its popularity, improvements may have been made on it by other researchers. Three further questionnaires specifically developed to measure aspects of spider phobia in adults were developed after the SPQ, namely the Watts and Sharrock Spider Phobia Questionnaire (WSQ; Watts & Sharrock, 1984), the Spider Phobic Beliefs Questionnaire (SBQ; Arntz, Lavy, van den Berg, & van Risjoort, 1993) and the Fear of Spiders Questionnaire (FSQ; Szymanski & O'Donahue, 1995)[2].

1.10.2 The Watts and Sharrock Spider Phobia Questionnaire (WSQ; Watts & Sharrock, 1984)[3]

The authors wanted to devise a measure which would not only measure the change in severity of phobia before and after treatment, but which would also distinguish between separate dimensions of responsiveness (Watts & Sharrock, 1984). The questionnaire consists of 43 items requiring ‘Yes’ or ‘No’ responses. After applying the questionnaire to a sample of spider phobics (N=176), the authors distinguished three separate scales within the questionnaire, specifically *vigilance, preoccupation* and *avoidance-coping.* Correlations within each scale were high (over 0.75) and larger than those between scales (between 0.27 and 0.47).

The questionnaire had good discriminant validity when it was administered to non-phobics and phobics. After *in-vivo* desensitization therapy all three scales showed decrements in phobic responding. A no-treatment control group showed no significant

[2] The FSQ was not chosen for this study because it was decided, after consulting the literature, that it would not add significantly to the information provided by the WSQ and the FQ.
[3] The WSQ appears in full in Appendix A.

change in scores on the three scales, indicating good test-retest reliability. The questionnaire was externally validated against other measures including a BAT and a subjective anxiety scale.

The authors suggested that the vigilance scale measures the degree to which phobics constantly visually scan for spiders in the environment. The preoccupation scale measures the degree to which phobics experience distressing cognitions about spiders. For example "(some phobics) felt haunted by spiders, imagined them vividly and often dreamed about them. They tried to think of spiders as little as possible" (Watts & Sharrock, 1984, p.576). The third scale, avoidance–coping, was a bipolar scale, indicating how much phobics were able to cope with spiders independently or how much they fled from spiders and sought help from others.

The results of Watts & Sharrock, (1984) have been replicated by Barker & Edelman (1987). The questionnaire has been used in further studies (e.g., Gilroy, Kirkby, Menzies, & Montgomery, 2000; Öst et al., 1991; 1997). A slight drawback of the measure is that no data was provided about the validity and reliability of the total score of the WSQ, meaning one has to use the three individual scale scores. However, Szymanski & O'Donahue (1995) asserted that the WSQ appeared to be an improvement over the SPQ. Given these comments, the limited criticisms of the measure, the wide endorsement of it by other researchers, and the more richly detailed insight provided into cognitive and behavioural phobic responding, it was decided that the WSQ was a more appropriate measure than the SPQ for this study.

1.10.3 The Spider Phobic Beliefs Questionnaire (SBQ; Arntz et al., 1993)[4]

The authors developed this measure to address the lack of understanding of the role of cognitions in animal phobias. Disagreeing with the notion that animal phobias are cognition-less (as suggested by Seligman, 1971), they investigated the beliefs of people with spider phobia, both about themselves and spiders. They argued that during confrontations with spiders the cognitive content of the fear becomes activated. While conducting exposure *in-vivo* treatments, the authors noticed that many of the patients would spontaneously express highly developed catastrophic beliefs regarding spiders, for example, "patients frequently claimed that they did not dare touch the animal, because it would jump on them, because it would be poisonous or because it would bite them" (Arntz et al., 1993, p.259). Patients also expressed fears about their own reactions and the consequences of becoming very anxious in an unavoidable encounter with a spider, e.g. "if the spider …crawls on me, I will scream or yell uncontrollably" (Arntz et al., 1993, p.269).

Five factors were extracted from the spider related beliefs: (a) *harm* (beliefs about the spider being dangerous and attacking), (b) *hunter and prey* (thoughts that the spider chases the person), (c) *unpredictability* (the spider is fast and unpredictable), (d) *territory* (the spider will penetrate the personal territory), (e) *multiplication* (the spider will multiply, or more will appear). A further four factors were extracted from the self-related beliefs, including (a) *panic* (similar beliefs to panic patients, such as having a heart attack or losing control), (b) *paralysis* (being unable to think or move during a spider

[4] The SBQ appears in full in Appendix B.

confrontation), (c) *incubation* (beliefs that the fear of spiders will get worse after a confrontation), and (d) *unrestrained behaviour* (such as lashing out or screaming).

The internal correlations of the factors was high (between 0.93 and 0.68) and greater than between factors correlations (under 0.68). Convergent validity was established, the SBQ correlating in the expected direction with other indices of spider phobia, such as the SPQ and BAT. The correlations were modest though, which suggests that it taps unique aspects of spider phobia, and does not correlate so strongly with other measures as to make it redundant. The authors demonstrated, by way of an ANOVA, significant differences between phobic and non-phobic overall scores on the SBQ thus supporting its discriminant validity. Only one subscale, unpredictability, proved to be unreliable on retest. All the other subscales and the two scales (self and spider related) proved reliable . The two scales also proved to be sensitive to change after therapy, showing significant reductions in phobic beliefs.

The findings of Arntz et al. (1993) have not been replicated in the literature. Despite this it was thought that the SBQ could prove useful in recruitment of phobic people into the study. This was because the experimenter, during the recruitment stage, had to rely solely on the spider phobia questionnaires to distinguish clearly between people who merely disliked spiders from those who had a clinical level of fear. Arntz et al. (1993) commented that:

> Firstly…spider phobics appear to have an abundance of harm, attack, and predator related ideas about spiders. Secondly, various ideas about spiders seem to be very exotic, so exotic that they appear to be derived from horror movies or to be produced by a psychotic person. How can people who are for the most part psychologically healthy believe in such strange ideas? (p.275)

Thus the presence of these irrational, catastrophic or negative beliefs would provide a key indicator of phobia in addition to the WSQ.

The nature of the therapeutic intervention in this study was such that it operated in the cognitive domain. Thus, an additional reason to include the SBQ was that it specifically measures cognitively expressed fear responding, would provide an interesting indicator of the effect of video modelling on different cognitive aspects of spider phobia.

CHAPTER 2

Method

2.1 Participants

Participants were recruited from advertisements on noticeboards around the university and from a student job search service on campus. The recruitment phase took 11 months and, of the 123 people who applied to be selected, 16 (14 females, 2 males) met the requirements to be recruited into the study. The participants received payment for their involvement.

In order for an individual to participate in the study, they had to meet certain selection criteria (adapted from Ost, 1996). They had to:

1. (a) Be in the phobic range (a minimum of ½ a standard deviation below the mean reported for phobic groups in the relevant validation sample) on 2 out of 3 subscales on the Watts and Sharrock Spider Phobia Questionnaire (WSQ; Watts & Sharrock, 1984); or (b) be in the phobic range on one subscale of the WSQ and on one subscale (spider-related or self-related) of the Spider Phobic Beliefs Questionnaire (SBQ; Arntz, Lavy, van den Berg, & van Risjoort, 1993);

(2) be between the ages of 18 and 60 years;

(3) indicate that their fear affected them in their daily lives;

(4) have been afraid of and exhibited avoidance of situations with spiders;

(5) have had a minimum of one-year duration of the phobia;

(6) be incapable of inserting a hand into a plastic container with a spider (during the behavioural test);

(7) have no disease of the heart or lungs; and

(8) have no indications of severe depression requiring immediate treatment.

All patients were screened using the Hospital Anxiety and Depression Scale (HADS; (Zigmond & Snaith, 1983). None of the 16 participants were classified as having moderate or severe depression.

All the participants filled out a self-disclosure form[5] which asked them several questions about themselves and their fear of spiders. All of them indicated that their fear affected them in their daily lives, either in social, vocational or recreational activities. Individual characteristics are presented in Table 2.1. Each participant has been given a pseudonym to ensure anonymity.

[5] The Self-Disclosure Form appears in full in Appendix C.

Table 2.1

Participant Characteristics.

Participant	Sex	Age	Ethnicity	Occupation	Education	Fear Onset
Naomi ***A)Self***	F	22	NZ European	Student	Year 13	No memory
Mary ***A)Peer***	F	22	NZ European	Student	Year 13	4-11 yrs old.
Rachael ***B)Self***	F	21	NZ European	Student	Year 13	4-11 yrs old
Justine ***B)Peer***	F	19	NZ European	Student	Year 13	No memory
Jenny ***C)Self***	F	21	NZ European	Student	Year 13	4-11 yrs old.
Faith ***C)Peer***	F	38	NZ European	Student	Degree	4-11 yrs old
Melanie ***D)Self***	F	21	NZ European	Mental health	Degree	No memory.
Elaine ***D)Peer***	F	25	NZ European	Student	Degree	4-11 yrs old.
Kevin ***E)Self***	M	36	NZ European	Student	Tech.Institute	No memory.
Dana ***E)Peer***	F	33	NZ European	Student	Post-graduate	4-11 yrs old.
Karla ***F)Self***	F	39	NZ European	Student	Year 12	4-11 yrs old
Mae ***F)Peer***	F	21	NZ European	Student	Univ Entrance	No memory
Sandra ***G)Self***	F	22	NZ European	Student	Univ Entrance	4-11 yrs old.
Xin G***)Peer***	F	23	Chinese	Student	Year 11	12-18 yrs old
Chris ***H)Self***	M	27	NZ European	Unemployed	Year 11	Before 4.
Karen ***H)Peer***	F	21	NZ European	Student	Degree	Before 4.

2.2 Assessment

2.2.1 Battery of Self-report Measures

The measures decided upon to gauge phobic symptoms were the WSQ (WSQ; Watts & Sharrock, 1984) and the SBQ (SBQ; Arntz, Lavy, van den Berg & Rijsoort, 1993).

Two more questionnaires were added to these to form the self-report battery. These were the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983)[6] and the Generalised Self Efficacy Scale (GSES; Schwarzer & Jerusalem, 1992)[7].

These questionnaires were administered when participants were screened in the recruitment stage, again at the first pre-treatment phase, post-treatment and at six-week follow-up.

2.2.1 (a) The HADS.

The HADS is a 14-item questionnaire that asks the respondent to choose the ending of sentences indicating how depressed or anxious they have been feeling in the past week. For example, the first item is "I feel tense or 'wound up'", and the participant has to indicate which ending comes closest to how they have been feeling out of the options "Most of the time", "A lot of the time", "From time to time", and "Occasionally".

It contains two 7-item subscales, one measuring anxiety (generalised anxiety not focussed on any particular situation, covering anxious mood, thoughts and restlessness) and the other measuring depression (focussed on the loss of interest and diminished pleasure response). Moorey et al. (1991) investigated the internal consistency of the subscales with a sample of 568 cancer patients, and found that Cronbach's Alpha for the anxiety scale was 0.93, and .90 for the depression scale. They also found that construct validity was good, as items loaded on the expected subscales, and accounted for 53% of the variance. Zigmond & Snaith (1983)

[6] The HADS appears in full in Appendix D.
[7] The GSES appears in full in Appendix E.

compared five-point psychiatric rating scales of anxiety and depression with HADS scores for 100 medical outpatients. Concurrent validity was satisfactory, with significant correlations of 0.54 for the anxiety scale and 0.79 for the Depression scale. Snaith & Zigmond (1994) quote the results of an unpublished study examining test-retest reliability with healthy participants (whose emotional states were assumed to be more stable). It indicated significant correlations of 0.92 for the depression scale and 0.89 for the anxiety scale.

2.2.1(b) The GSES

The Generalised Self Efficacy Scale is a 10-item questionnaire that measures a respondent’s generalised self-efficacy, defined as “the strength of an individual’s belief in his or her own ability to respond to novel or difficult situations and to deal with any associated obstacles or setbacks” (Weinman, Wright, & Johnstone, 1995, p. 35). Respondents are required to indicate the extent to which each statement applies to them. For example, the first item is “I can always manage to solve difficult problems if I try hard enough.” The respondent has to choose between “Not at all true”, “Barely true”, “Moderately true” and “Exactly true”.

Normative data and psychometric analysis has been conducted using German samples and the German version of the measure. No data yet exists regarding the English translation. Weinman et al. (1995) collated the data from five different studies and all found that the GSES had high internal consistency (Cronbach’s Alphas between 0.82 and 0.93). Test-retest reliability was found to be 0.47 for men and 0.63 for women over a two-year period. Concurrent validity has been established by comparisons with tests of self esteem (0.52), internal control beliefs (0.40) and optimism (0. 49).

2.2.2 Self-Reporting During Experimental Procedures

2.2.2 (a) Specific self-efficacy inventory (SSI) [8].

To gain some more insight into the hypothesised process of change in self-efficacy over the course of the experiment, it was necessary to collect self-report data before the Behavioural Approach Tests (BAT's) and after each viewing of the treatment video.

In order to assess changes in self-efficacy specific to situations with spiders, the participants were given a questionnaire which was based on the approaches to measuring self-efficacy outlined by Bandura (1997) and exemplified in the research of Öst and his colleagues (e.g., Öst, Ferebee and Furmark, 1997). The questionnaire was named the Specific Self-Efficacy Inventory (SSI), and it consisted of two parts. The first part described (a) the self or peer model's actions during the three scenes depicted in the treatment video, and (b) the 14 steps of the BAT. The participants rated their self-efficacy strength (explained as "your confidence about being able to complete the action shown in the video, or the step described in the BAT") on each item on a 0-100 scale, following Ost, Ferebee & Furmark (1997). The second part of the questionnaire required participants to rate how calmly they would deal with situations with spiders that occurred outside the laboratory, for example visiting the spider exhibit at the zoo. They provided self-efficacy strength responses on a 7-point Likert scale, ranging from 1 ("I would panic and not be able to cope at all") to 7 ("I

[8] The SSI appears in full in Appendix F.

would remain calm and cope effectively with the situation"). These scores were then converted to percentages.

They were required to complete the SSI before both of the BAT administrations in the baseline phase, after each viewing of the video in the treatment phase, and before the administration of the BAT at post-treatment and follow-up (a total of 11 times). In line with the recommendations of Bandura (1997), these measurements provided an extremely sensitive way to gauge changes in self-efficacy level (difficulty of tasks), strength (certainty of being able to perform tasks) and generality (self-efficacy across different types of situations with spiders).

Scores were calculated across the dimensions of level and strength. Following Bandura et al. (1982) and Ost et al.(1997), the level of self-efficacy was the number of performance tasks with a self-efficacy strength score of 20% and above. If participants rated their self-efficacy strength below 20% they were judged as perceiving themselves incapable of executing the activity.

Self-efficacy strength scores were calculated by summing the scores for each section and dividing by the total number in each to give a mean. Thus, means were produced for BAT Self-Efficacy Strength, Everyday Self-Efficacy Strength, Video Self-Efficacy Strength, and Overall Self-Efficacy Strength.

2.2.2 (b) Subjective units of distress scale (SUDS).

Subjective distress was measured using a Subjective Units of Distress (SUDS) measure, where participants rated the level of anxiety experienced on a 0-10 scale. This was carried out in two different settings. In the laboratory assessments, the participants reported their level of anxiety to the experimenter at the point where they terminated the BAT. During the treatment phase the participants recorded their SUDS on a response form[9] after the conclusion of each scene in the videotape exposures (after each scene the video presented a blank screen for 10 seconds to allow the participant to record their level of anxiety).

2.2.3 Physiological Measures

During the four laboratory assessments, measures of heart rate (HR) were taken using a portable digital apparatus which attached to the participant's finger. These were taken at two points, once after a 5-minute rest period at the beginning and once at the point the participant interrupted the behavioural test. This provided a measure of the amount the HR increased from its resting rate at the conclusion of the BAT.

2.2.4 Behavioural Measures

The BAT was used to assess the participants' degree of overt avoidance of spiders. A container with a live sheet-web spider (measuring 3 to 4 cm) inside was placed on a table in the far end of a room (5 x 6m). The test involved increasingly difficult tasks in approaching the spider. The scoring and procedure was based on a combination of elements of different BAT's in the literature (specifically, an amalgam of the BATs of Öst, Salkovskis, & Hellstrom, 1991; and Gilroy, Kirkby, Daniels, Menzies, &

[9] The SUDS response form is shown in full in Appendix G.

Montgomery, 2000). It has more steps on it than these earlier BAT's. This was done to increase the sensitivity of the measure to smaller changes in behaviour.

Table 2.2

The 14 Steps of the BAT.

Score	***The BAT***
0	Stop 4m from container.
1	Stop 3m from container.
2	Stop 2m from container.
3	Stop 1m from container.
4	Stop close to the table with the container.
5	Touch the container.
6	Lift the container and hold it using both hands.
7	Hold the container close to face and observe the details of the spider.
8	Loosen the lid so that it is nearly off.
9	Remove the lid completely.
10	Let the spider out of the container.
11	Catch the spider using the container and cardboard and replace the lid.
12	Touch the spider with a finger.
13	Handle the spider out of the container using both hands and replace in the container.

The procedure followed Ost et al. (1991) as much as possible. The participants were instructed about the scoring of the BAT and then given the SSI to fill out regarding their confidence about completing each step. Then they were instructed to open the door, walk up to the container, remove the lid, get the spider out of the container by touching it with a pencil, recapture it and then to touch it with a finger and handle it. The importance of doing their best was emphasised but they were reminded that they could stop the test at any stage if their anxiety became too uncomfortable. The experimenter stayed on the other side of the door to minimise the effect of his presence.

When the participant stopped approaching the spider they stayed where they were. The experimenter then came up and took the HR measure and asked the participant for a SUDS rating.

Participants performed this test once at the beginning and once at the end of their baseline period. Although this would only provide two baseline measures, it was thought necessary to limit the BATs before the treatment phase so as to minimise the exposure to the spider, which may have confounded the stability of the baseline measure. Following two weeks of exposure to their self-model tapes, they performed another BAT, and then once more at the six-week follow-up. SSI, HR and SUDS measures were gathered at each of these occasions.

2.3 Apparatus

Heart rate was measured with a Lafayette model 77065 heart rate monitor. The treatment scenes were filmed with a Canon XL1SE Mini DV digital camcorder.

Several 'props' were used to create the 'blue screen' scenes[10]. These included fabric, movable backgrounds, and cardboard boxes (all painted blue). It was important for all the fabric and the painted items to be similar in colour. The blue screen scenes were lit using 3 Ross 1000w 'sun guns' mounted on tripods. The scenes were edited together using a Videonics MXPRODV digital video mixer.

The phobic stimuli used in the experiment were two spiders. The first was a 'Sheet-Web' spider (in the genus *Cambridgea)*, common to New Zealand native forests, which was used for the BAT. It measured approximately 3-4 cm across, including legs. It was placed in a transparent plastic cage, (10 x 10 x 20cm) with a screw-top lid. The second spider was a Peruvian Pink-Toed Tarantula (*Avicularia Avicularia*). The spider was approximately 10 cm long (including legs) and had a thick body and legs, making it ideal for blue-screen filming. This spider was shown only in the treatment videos and not live. The scenes with the tarantula were included to present the video modelling equivalent of Öst's (1989) 'overlearning' in his exposure therapy.

2.4 Procedure

2.4.1 Recruitment

All potential participants made the initial contact via email to the experimenter. They were sent an information pack by mail or email. This contained information about the experiment, the self-disclosure form, and the battery of questionnaires.

[10] Appendix H describes how the filming of the treatment videos was carried out.

The self-disclosure form screened for physical health, and determined age of onset and demographic details. It also asked the participant to describe their first memory of being afraid of spiders, their scariest experience with spiders, how their fear affected them in everyday life (in social, vocational and recreational activities), and what (if any) thoughts or images repeated in their minds about spiders. The main purpose of this was to see if their symptoms were severe enough for them to be included in the study.

The main purpose of the HADS was to screen for depression but it also gave an indication of generalised anxiety (although this was not made a criterion for exclusion). The phobic questionnaires gave an indication of severity of phobic symptoms, and the GSES an indication of their level of generalised self-efficacy (which was also not an exclusion criterion).

Participants were then grouped together as matched pairs. The three criteria were, in order of importance:

1) Phobic Symptoms measured by the three subscales of the WSQ;
2) Gender;
3) Phobic beliefs as measured by the SBQ.

The matched pairs are shown in Table 2.1; each pair was assigned a letter (A through to H).

2.4.2 Pre-Treatment (Baseline) Phase

The research design used was multiple baseline across-subjects. Participants underwent baseline (pre-treatment) periods of varying lengths (between 2 and 3 weeks). All participants came into the lab twice in this period, once at the beginning and once at the end. Both members of each pair came in on the same days. At assessment 1, participants completed the battery of questionnaires, the SSI and the BAT (which also provided SUDS and HR measures). Following the completion of the BAT, one member of each pair was involved in filming the scenes for the treatment video. These were then edited together by the researcher to produce the treatment videos.

At assessment 2, only SSI, SUDS, HR and BAT measures were taken. The participants were then given their peer or self-modelling videos (with no discussion about why they were going to see themselves or someone else on the video) with instructions about when and under what conditions they should watch them and forms on which to record SSI and SUDS scores.

2.4.3 Treatment Phase

The treatment phase lasted for two weeks. During this period, all participants watched the videotapes once every two days. They recorded their SUDS scores between each scene (rating how anxious each scene made them feel). They recorded their SSI scores at the conclusion of the tape. The tapes lasted approximately eight minutes and included three scenes showing a participant ‘interacting’ with spiders (see Appendix H for more detail). This phase was conducted in the participants’ homes. No BAT’s were conducted during this phase.

The treatment videos consisted of three scenes. The focus was on presenting spiders as being predictable and controllable, as some authors have suggested (e.g., Ost et al., 1991)these two factors are extremely important in therapy. In line with the feedforward self-modelling literature, the videos showed participants engaging in adaptive coping behaviours in the presence of spiders, which were currently beyond their capabilities. For all the scenes it was decided that mastery modelling may be slightly unrealistic and that coping modelling would present a more achievable future behaviour. Thus, the participants involved in filming were advised to 'act' a little, showing cautious yet undeterred behaviour.

2.4.4 Post Treatment Phase

After 2 weeks of exposure to the tapes, participants were assessed again at the lab. Assessment 3 was identical to Assessment 1, including the full range of measures (including the self-report battery).

2.4.5 Follow-up

Finally, six weeks after the conclusion of the treatment phase, Assessment 4 followed the same pattern as Assessment 1 and 3. Thus, overall longer-term change across all the measures could be ascertained to some degree.

CHAPTER 3

Results

3.1 Reliability

To ensure the reliability of the data entered for analysis from the response forms and the questionnaires, the data was entered into the computer twice, by two different coders. The data was then compared and discrepancies were checked and corrected. The data was organized into various spreadsheets using Microsoft Excel. This was then cut and pasted into both Jandel Sigmaplot (to create the graphs) and Microsoft Word (for the final document). Whenever data was transferred between spreadsheets or software, it was re-checked against the original data spreadsheets for each participant.

3.2 Analysis

The complexity of constructing the videotapes constrained the number of participants in the study. In addition, after initial data analysis, one pair contained outlying data and was therefore not included in the calculation of group means. Consequently the sample size used to calculate descriptive statistics from was 14, with 7 in each group. For this reason, inferential statistical tests have not been used. The focus has been placed instead on detailed analysis of individual cases, and patterns that have been replicated across cases. Results are presented in tables and graphs and analysed visually. Assessments are numbered 1 through to 4 on the graphs to represent baseline through to follow-up assessments. Means, standard deviations and effect sizes[11] are shown in tables. The tables show mean changes across self and peer-modelling groups, and also a comparison of changes within each pair (self-modelling participant’s change - peer-modelling participant’s change), the mean of all pairs being displayed. It should be noted that percentage scores represent proportions of the maximum possible score on each measure, not proportions of initial (assessment 1) score.

Of the eight pairs of participants who took part in the study, all followed the treatment programme as intended by the researcher. However, one participant (Karla) disclosed at the end of the experiment that she had bipolar disorder. The data showed that she deviated markedly from the general pattern shown by other participants on many of the measures. Overall, her improvements were minimal, and during the treatment phase, her self-efficacy varied between days considerably. Further, her scores on the HADS elevated from moderate to severe anxiety by the end of the study, indicating an on overall increased tendency towards general anxiety. Given these factors, when calculating group means it was decided that the results from this pair (Pair F) should be analysed separately from the other pairs, as they constituted outlying data which

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[11] The effect sizes for the comparison of changes between participants in each pair (between groups) are Cohen's *d;* calculated as: Cohen’s $d = M_1 – M_2 / S.D.\ pooled;$ where $S.D.\ pooled = \sqrt{[(S.D._1^2 = S.D._2^2)/2]}$ *where* M_1 = mean difference score (assessment 4 – assessment 1) for the group with the largest change (usually the self-modelling group); M_2 = mean difference score for the group with the smallest change; $S.D._1$ = S.D. for difference scores of group 1; and $S.D._2$ = S.D. for difference scores of group 2. The effect sizes for mean changes within self or peer-modelling groups (repeated measures within groups) are based on Cohen’s *d*, they are calculated with $Effect\ Size = M_1 – M_2 / S.D.\ pooled;$ where $S.D.\ pooled = \sqrt{[(S.D._1^2 = S.D._2^2)/2]};$ *where* M_1 = Group assessment 4 mean, M_2 = Group assessment 1 mean, $S.D._1$ = S.D. for assessment 4, and $S.D._2$ = S.D. for assessment 1. It should be noted that the within groups effect size is a raw effect size, and not Cohen’s *d.*

would skew and distort the means. Thus, this pair's data was not included in the calculation of means, yet it does still appear in the figures which display individual scores. The full tables showing the results from all the participants' means and standard deviations appear in Appendices I to L.

3.3 Self-Reported Specific Self-Efficacy: The SSI

3.3.1 Self-Efficacy Strength

Figure 3.1 shows the group means for all the different self-efficacy strength measures over four assessments[12]. It can be seen that both groups commenced the experiment at approximately the same strength across the four measures. The self-modelling group then reported consistent increases in self-efficacy strength at each assessment across all measures. The peer-modelling group reported increases comparable in size on BAT self-efficacy only, and smaller increases on the other measures. The largest change within groups, and the largest difference between the groups was the overall mean change in video self-efficacy for the participants that had received self-modelling. The mean changes, standard deviations and effect sizes are shown in Table 3.1.

[12] The data for each individual participant on all self-efficacy measures is given in Appendix I.

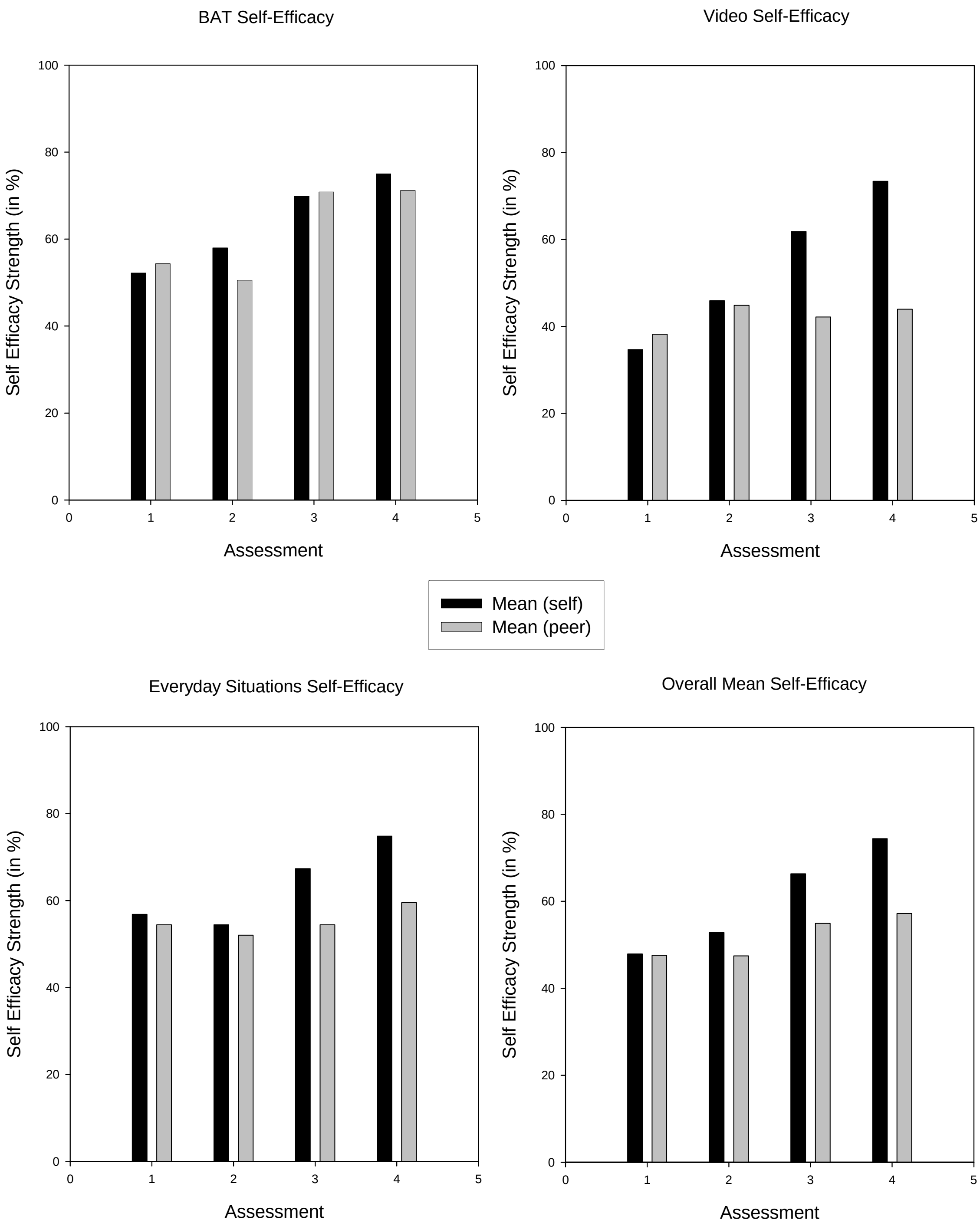

Figure 3.1. Self-efficacy strength means across assessments on four different measures.

Table 3.1

Mean Changes in all Self-Efficacy Strength Measures, Standard Deviations and Effect Sizes.

Change in Measure (Assessment 4 – Assessment 1)	Mean	S.D.	Effect Size
BAT Self-Efficacy Strength			
Mean - self (S.D.)	22.81	16.77	1.41
Mean – peer (S.D.)	16.85	16.65	1.46
Difference (self-peer)	5.96	26.02	0.36
Video Self-Efficacy Strength			
Mean - self (S.D.)	38.75	20.49	2.08
Mean - peer (S.D.)	5.71	20.09	0.24
Difference (self-peer)	33.04	34.41	1.63
Everyday Self-Efficacy Strength			
Mean - self (S.D.)	18.03	15.96	1.46
Mean - peer (S.D.)	5.10	15.88	0.33
Difference (self-peer)	12.93	15.72	0.81
Overall Self-Efficacy Strength			
Mean - self (S.D.)	26.53	14.54	2.19
Mean - peer (S.D.)	9.61	10.22	0.72
Difference (self-peer)	16.92	19.72	1.35

It should be noted that in Table 3.1, the standard deviations were between 53% and 88% of the mean changes for the self-modelling group, and equal to, or much larger than, the mean changes for the peer-modelling group and the difference between individual changes in each pair. This indicates that there was a high degree of variability in change in self-efficacy strength measures over the course of the experiment, although this was less evident in the self-modelling group.

Figure 3.2 shows the individual variation in self-efficacy strength changes. The figure plots each participant’s assessment 1 self-efficacy strength score against their assessment 4 score. Therefore a participant who showed no change is represented as a point lying on the diagonal, whereas improvement is indicated by points lying above the diagonal, and worsening by points lying below it.

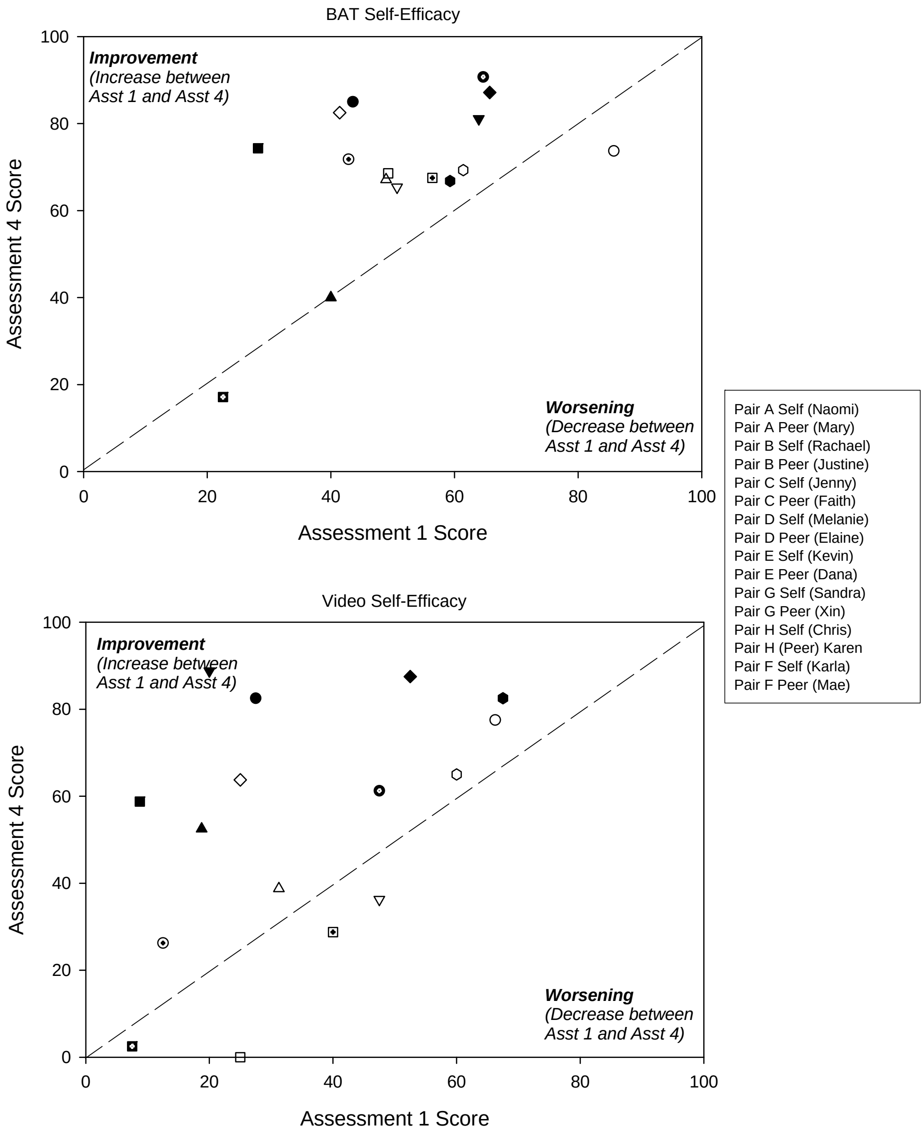

Figure 3.2. Self-efficacy strength score changes for each participant (including pair F). Assessment 1 score plotted against assessment 4 score.

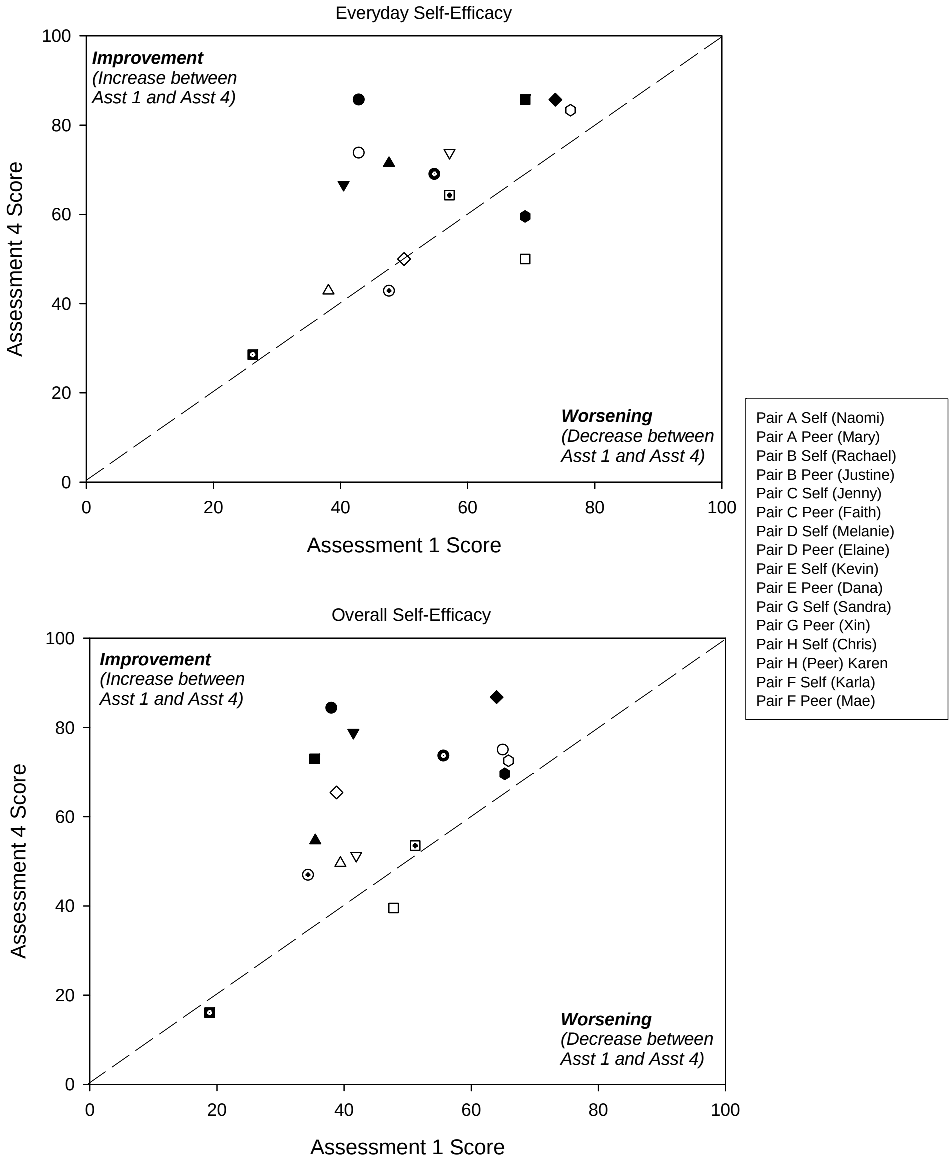

Figure 3.2 (continued). Self-efficacy strength score changes for each participant (including pair F). Assessment 1 score plotted against assessment 4 score.

Figure 3.2 shows that Karla’s data points (a) generally lay near the diagonal in the areas of the scatter-plots that indicate worsening over time, and (b) usually show less increases than Mae’s. For all the other participants, on every measure except BAT self-efficacy, every participant that received self-modelling showed more improvement than the peer-modelling member of their pair (with the exception of Sandra, who showed approximately equal change to Xin on the Overall measure and less change on the Everyday measure.) On the BAT self-efficacy measure, two self-modelling participants (Naomi and Rachael) showed more increases than the peer-modelling participants in the pair, three (Melanie, Sandra, and Chris) showed approximately equal change, and two (Jenny and Kevin) did not show as much change.

The largest changes in self-efficacy strength occurred in the self-modelling participants' scores on the Video measure. The changes for the individuals in each pair are depicted in Figure 3.3, which plots changes in this measure as a proportion of each participant's initial score at assessment 1. The figure shows reports of video self-efficacy strength taken in the laboratory for the baseline, post-treatment, and follow-up phases, and also during the treatment phase, where ratings were noted down by the participants after watching each individual scene.

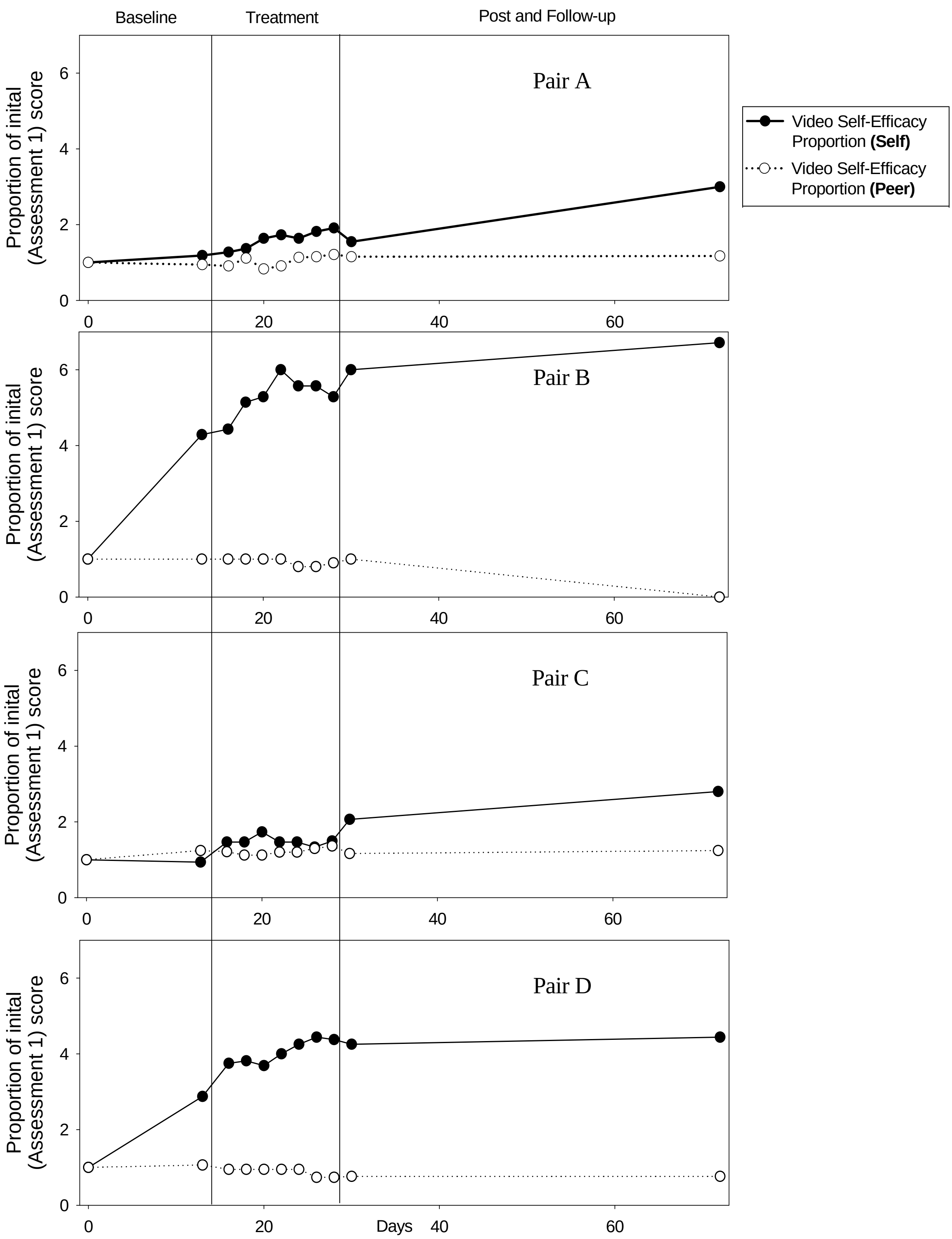

Figure 3.3. Video self-efficacy plotted as a proportion of initial score (assessment 1) for each participant.

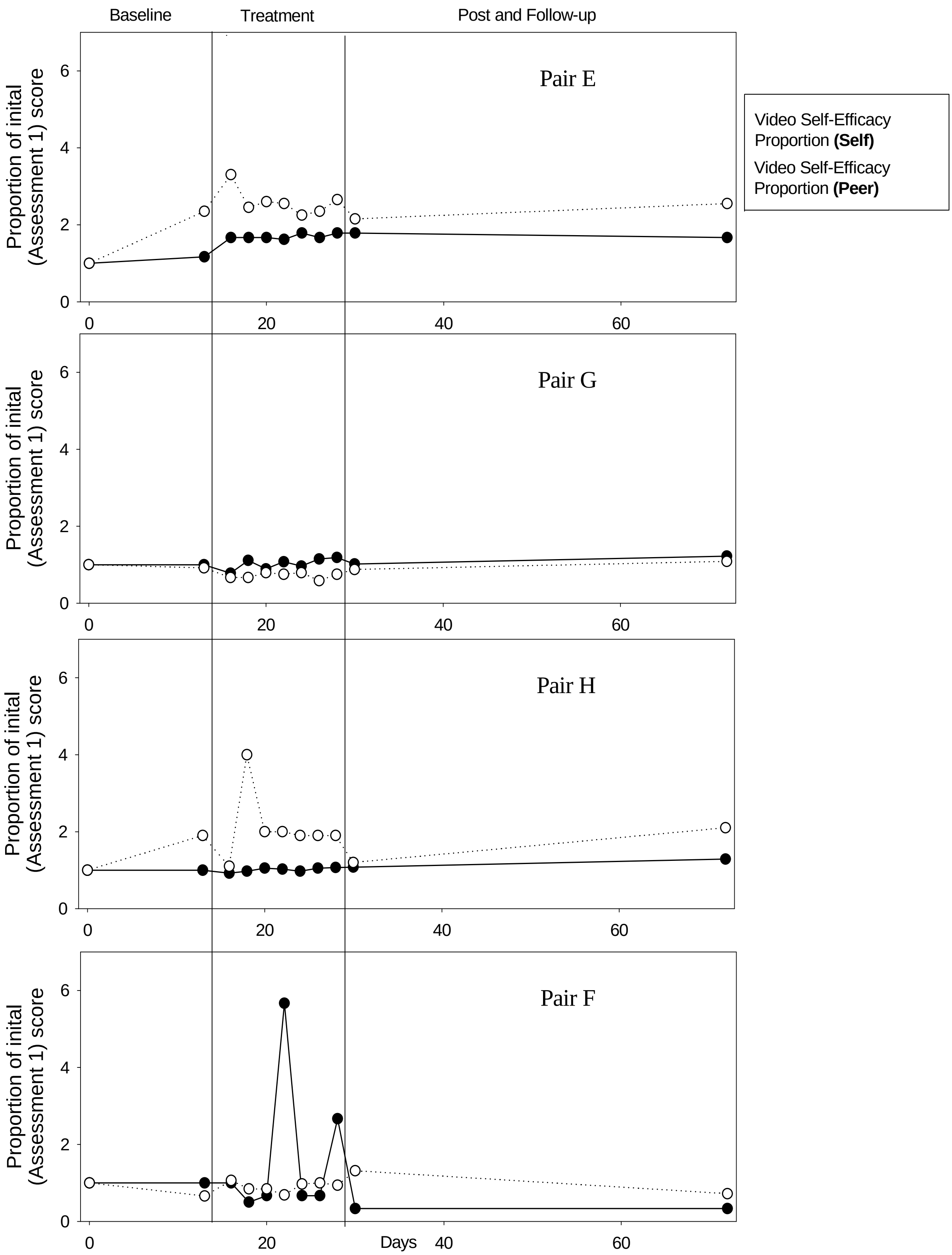

Figure 3.3 (continued). Video self-efficacy plotted as a proportion of initial score (assessment 1) for each participant.

In the self-modelling group, Naomi (A), Jenny (C), Kevin (E), Sandra (G), and Chris (H) showed stable baselines, and Rachael (B) and Melanie (D) showed sharp increases. In the peer-modelling group, Mary (A), Justine (B), Faith (C), Elaine (D) and Xin (G) showed stable baselines, Karen (H) and Dana (E) showed increases.

During treatment, in the self-modelling group, Naomi, Rachael, Jenny, Melanie and Kevin showed steady increases in video self-efficacy. Xin and Karen remained at baseline levels. In the peer-modelling group, none of the participants showed consistent increases across the treatment phase.

After treatment, in the self-modelling group, only Kevin showed a decrease by follow-up. Out of those who had received peer-modelling, only Dana, Xin and Karen showed an increase between post-treatment and follow-up.

In Pair F, Karla, while viewing images of herself with spiders, showed unstable video self-efficacy strength. During some viewings it was lower than initial levels, and during others it was almost six times greater. After treatment her video self-efficacy strength remained at low levels. Mae, after receiving peer-modelling, showed a slight increase over the treatment phase, but returned to initial levels by follow-up.

3.3.2 Self-Efficacy Level

After both interventions, mean self-efficacy level increased by two BAT steps for the self-modelling group (S.D. = 2.31, Effect size = 0.71) and by 0.71 BAT steps for the peer-modelling group (S.D. = 3.99, Effect size = 0.28). The difference within individual pairs therefore averaged 1.29 BAT points (S.D. = 5.88, Effect size = 0.40). Figure 3.4 shows mean changes in self-efficacy level over time.

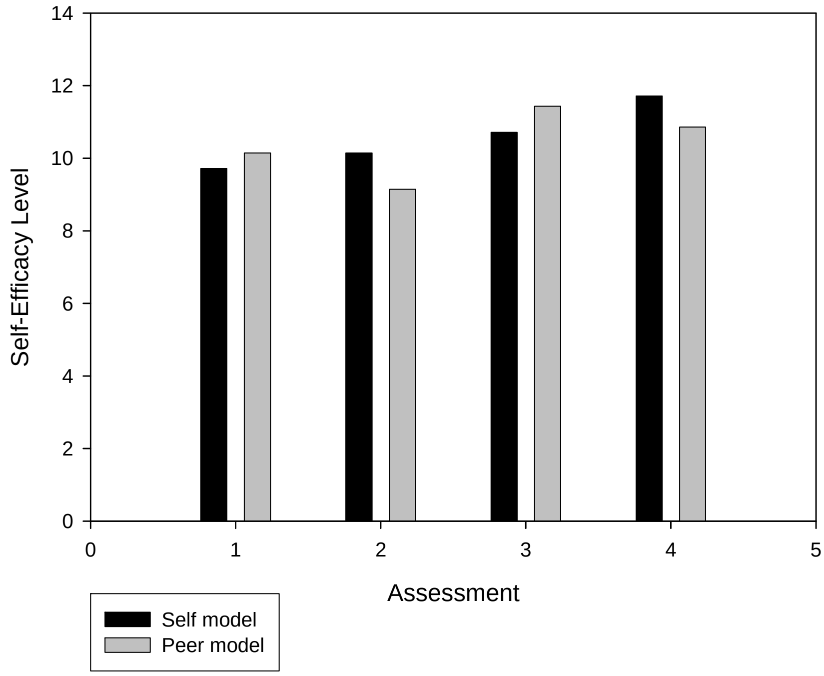

Figure 3.4. Self-efficacy level means over four assessments.

As can be seen from the results, both those who had received self-modelling and peer-modelling, showed small increases in self-efficacy level, but these increases were greater for the self-modelling group. It should also be noted that only the self-modelling group continued to show an increase in self-efficacy level between post-treatment and follow-up.

The self-efficacy level was measured by calculating how many items on the BAT the participants had 20% or more certainty about completing. As can be seen from the BAT description in Chapter 2, step 11 involved letting the spider out, and step 13 involved touching the spider with a finger. Over the course of the experiment, it was noted that these three steps in particular were very challenging. Most participants, despite intense efforts, reached their limits at these points. Figure 3.5 shows changes in self-efficacy level over every phase of the experiment for each participant.

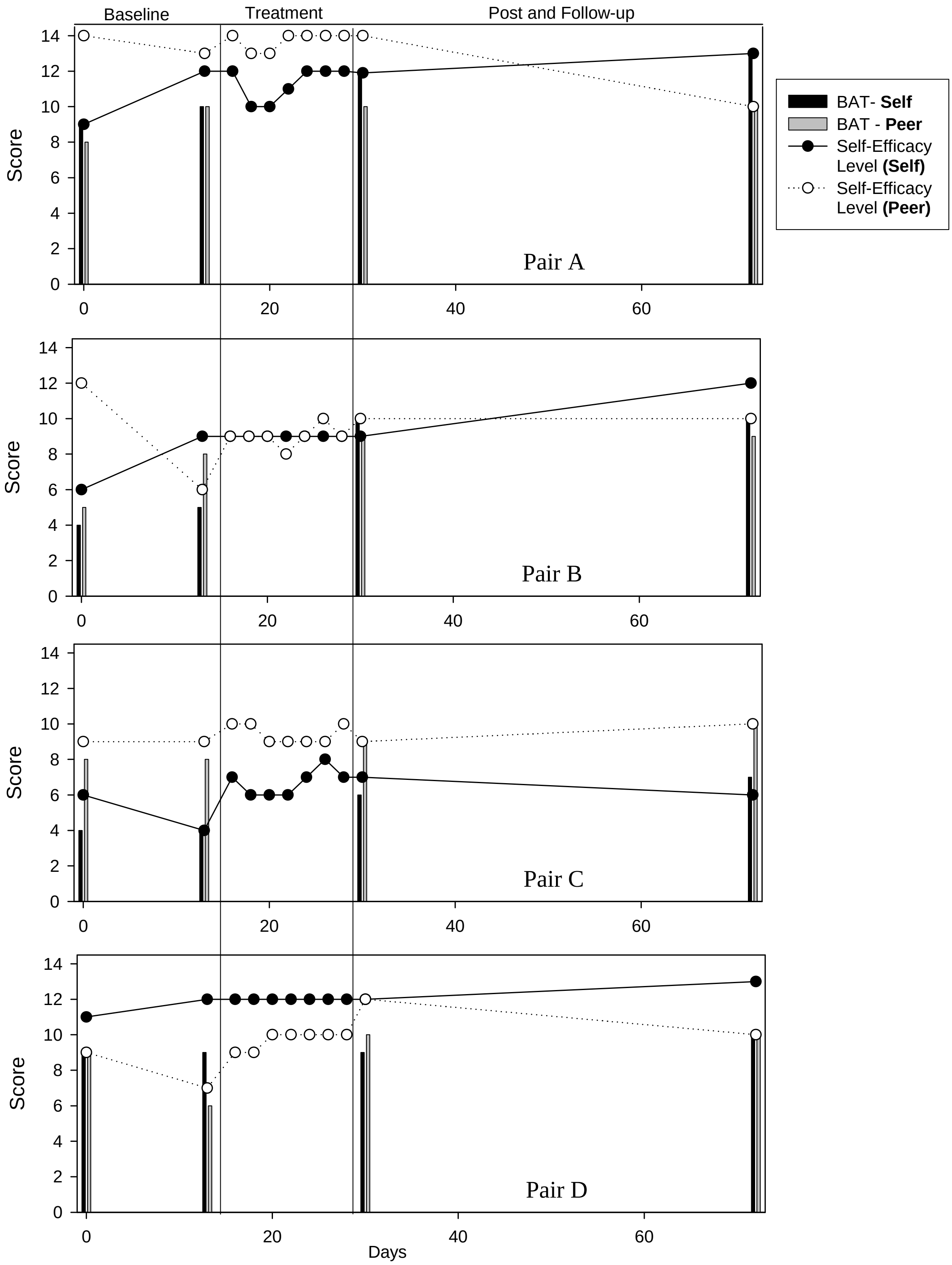

Figure 3.5. BAT scores and self-efficacy level for each pair of participants.

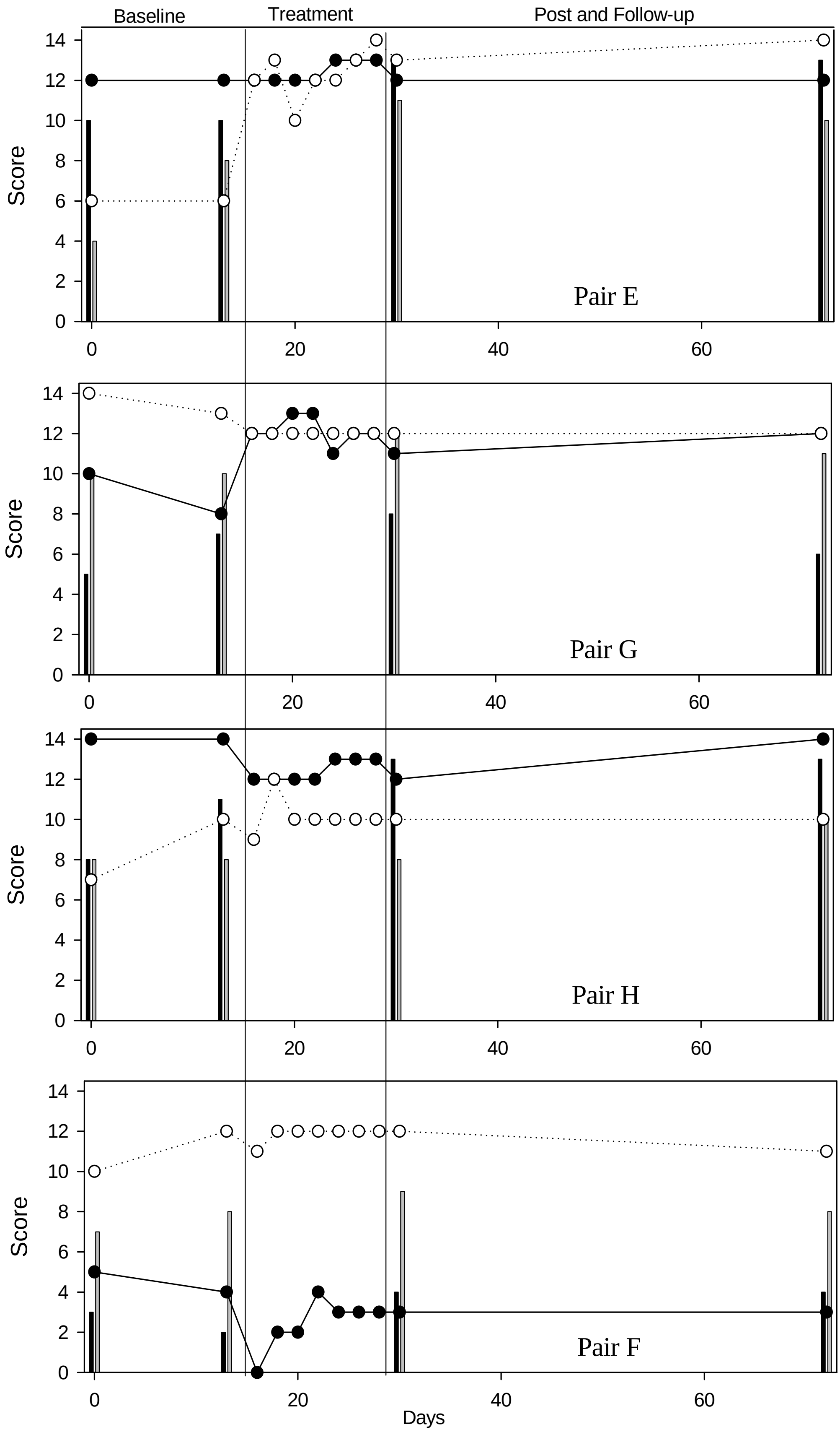

Figure 3.5 (continued). BAT scores and self-efficacy level for each pair of participants.

In the self-modelling group, Melanie (D), Kevin (E), and Chris (H) showed relatively stable baselines, Naomi (A) and Rachael (B) showed increases, and Jenny (C) and Sandra (G) showed decreases. In the peer-modelling group, Mary (A), Faith (C), and Xin (G) and Dana (E) showed relatively stable baselines, Justine (B) and Elaine (D) showed decreases, and Karen (H) showed an increase.

During treatment, in the self-modelling group, Jenny, Kevin and Chris showed small increases, the other participants remained relatively stable. In the peer-modelling group, Elaine, Dana and Karen showed increases, and Mary, Justine, Faith, Xin remained stable.

After treatment, of those who received self-modelling Naomi, Rachael, Melanie, Sandra, and Chris showed increases, Jenny showed a decrease, and Kevin stayed the same. The participants in the peer-modelling group did not show much change after treatment, Mary being the only one to show any real change with a decrease of four points.

In pair F, while Karla remained relatively stable, Mae showed a slight increase at baseline. Karla showed some variability in self-efficacy level during treatment, and a general trend of a level of 3, lower than her baseline level, which continued until follow-up. Mae did not show any marked changes from her baseline level over the treatment post-treatment periods.

Figure 3.6 shows the changes in the mean BAT scores for both groups of participants[13]. It can be seen from the results that the average BAT score at assessment 1, for both groups, was approximately 7. This equated to being able to hold the container with the spider inside with both hands. Both groups improved on the approach measure by about 3 steps, on average, reaching a level of 10. At this step they could remove the lid completely but not let the spider out of the container. The self-modelling group improved 3.29 points (S.D. = 1.89, Effect size = 1.19). The peer-modelling group improved 3.14 points (S.D. = 1.86, Effect size = 1.96).

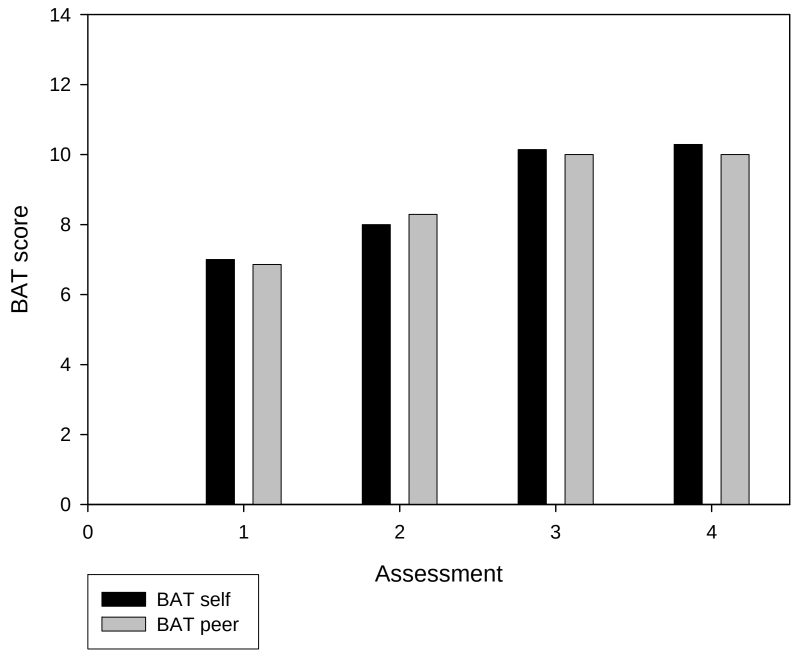

Figure 3.6. BAT performance means over four assessments.

[13] The BAT score for each participant is shown in Appendix J and Figure 3.5.

The observations of the researcher, as described earlier, confirm that letting the spider out (step 11) seemed to act as a rather major barrier for many of the participant and not many were able to achieve it despite high effort. The ones that did then seemed to progress through step 12 easily, catching the spider again. The second major obstacle to overcome was step 13, touching the spider.

The mean difference between individuals in each pair was only minor (0.14 steps on the BAT, (S.D. = 2.67, Effect size = 0.08). Both self-modelling and peer-modelling, on average, seemed to produce similar increases in BAT performance.

3.4.1 Trends across individual cases in BAT level achieved

Trends in individual BAT performance are shown in Figure 3.9, alongside self-efficacy levels. Each participant is analysed separately in this section, with comparisons between BAT and self-efficacy level, to enable fuller investigation of changes over the experiment.

3.4.1(a) Baselines for both groups.

In the self-modelling group, participants in pairs A to E showed stable baselines, and those in pairs G and H showed increases. In the peer-modelling group, participants in Pairs C, G and H showed stable baselines, A, B and H increases, and in D, a decrease.

3.4.1(b) Changes after treatment for the self-modelling group.

After treatment, Naomi (A) increased from step 10 to 12, and then to touching the spider by follow-up. She actually wanted to continue and hold the spider for 20 seconds (step 14) but the animal had fallen off the table in the course of the BAT and it was decided to stop the test. After treatment, Naomi performed exactly at her self-efficacy level. Rachael (B) did not increase immediately after treatment, but went from 9 to 12 by follow-up. After treatment, Rachael also performed closer to her self-efficacy level, although she felt able to do more at Assessment 4 than she actually achieved. Jenny (C) increased two points after treatment and then one further by follow-up, performing beyond her self-efficacy level. Melanie did not improve immediately after treatment but reached step 10 by follow-up. She constantly felt able to achieve more however. Kevin (E) could not achieve step 11 (letting the spider out) at baseline, but managed to achieve step 13, with much persistent effort, at post-treatment and follow-up, a level slightly more than he expected. Sandra (G) initially increased after treatment by one step, and then fell back to initial levels, despite her self-efficacy being at much higher levels. Chris (H) did manage to let the spider out at baseline but jumped back and could not catch it again. After treatment he was only able to touch the spider (level 13) although he felt able to hold it.

3.4.1(c) Changes after treatment for the peer-modelling group.

After treatment, Mary (A) showed no real change in BAT performance, being unable to get past step 10 and let the spider out. Her self-efficacy level came down to match her performance. Justine (B) showed a small increase, to level 9 (removing the lid), but was unable to progress further. Her self-efficacy level matched her performance closely. Faith (C) increased from 8 to 9, and then to 10 at follow-up, performing exactly at her self-efficacy level. Elaine jumped from 6 to 10 but was unable to go further, her self-efficacy level again coming down to match her BAT performance. Dana (E) progressed three steps upward to step 11 after treatment, although was unable to let the spider out again at follow-up, despite a self-efficacy level of 14. After treatment, Xin (G) went from 10 to 12, performing close to her self-efficacy level. Karen (H) progressed from 8 to 10 by follow-up, matching her self-efficacy level.

3.5 Self-Reported Spider-Phobic Beliefs: The SBQ

3.5.1 The SBQ spider and self-related subscales

Figure 3.7 shows the mean values for SBQ spider-related and self-related subscales for the combined participants' scores (excluding Pair F)[14]. As can be seen from the results, the peer-modelling group scored higher on both subscales at baseline. After treatment, both those who had received self-modelling and peer-modelling, showed reductions in phobic beliefs regarding both the spider's actions and their own actions during encounters with a spider. Both groups showed strong spider-related phobic beliefs and these were generally more resistant to change than the self-related phobic beliefs. Although the peer-modelling group showed an increase of spider-related phobic beliefs between post-treatment and follow-up, the self-modelling group continued to show further decreases. The scores on the self-related phobic-beliefs subscale were initially weaker for both groups and changed more than spider-related phobic beliefs after both interventions. Both groups showed continued decreases at follow-up, although these were more pronounced in the self-modelling group. Means, standard deviations and effect sizes are shown in Table 3.2.

[14] The data on all self-report questionnaires for each individual participant is shown in Appendix K.

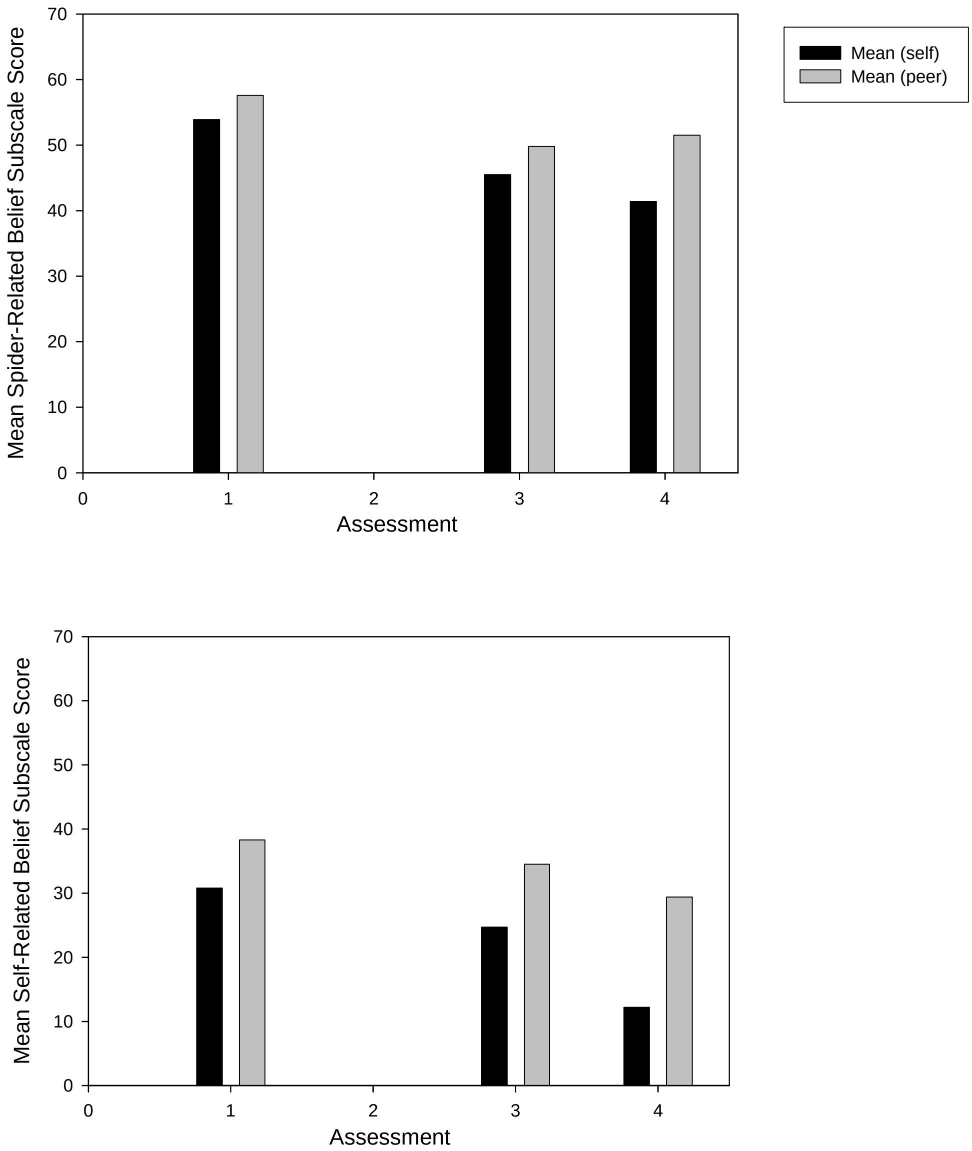

Figure 3.7. SBQ spider-related and self-related subscale means

Table 3.2

Mean Changes in SBQ Spider and Self-Related Subscales, Standard Deviations and Effect Sizes.

Change in Measure (Assessment 1 - Assessment 4)	Mean	S.D.	Effect Size
SBQ spider related mean (self)	-12.52	13.47	-0.73
SBQ spider related mean (peer)	-5.76	17.12	-0.41
Difference in spider-related subscale change (self-peer)	-6.76	15.15	-0.44
SBQ self-related mean (self)	-18.58	10.35	-1.84
SBQ self-related mean (peer)	-8.94	12.57	-0.55
Difference in self- related subscale change (self-peer)	-9.64	12.56	-0.84

As shown in Table 3.2, the average spider-related beliefs scores decreased more after self-modelling. The average self-related beliefs scores also decreased more after self-modelling, showing a larger effect size. The difference between participants within each pair was small for the spider-related means and larger for the self-related means. The large standard deviations relative to mean changes, indicate that there was a high degree of variability in change between the participants, although this was again less marked for the self-modelling participants.

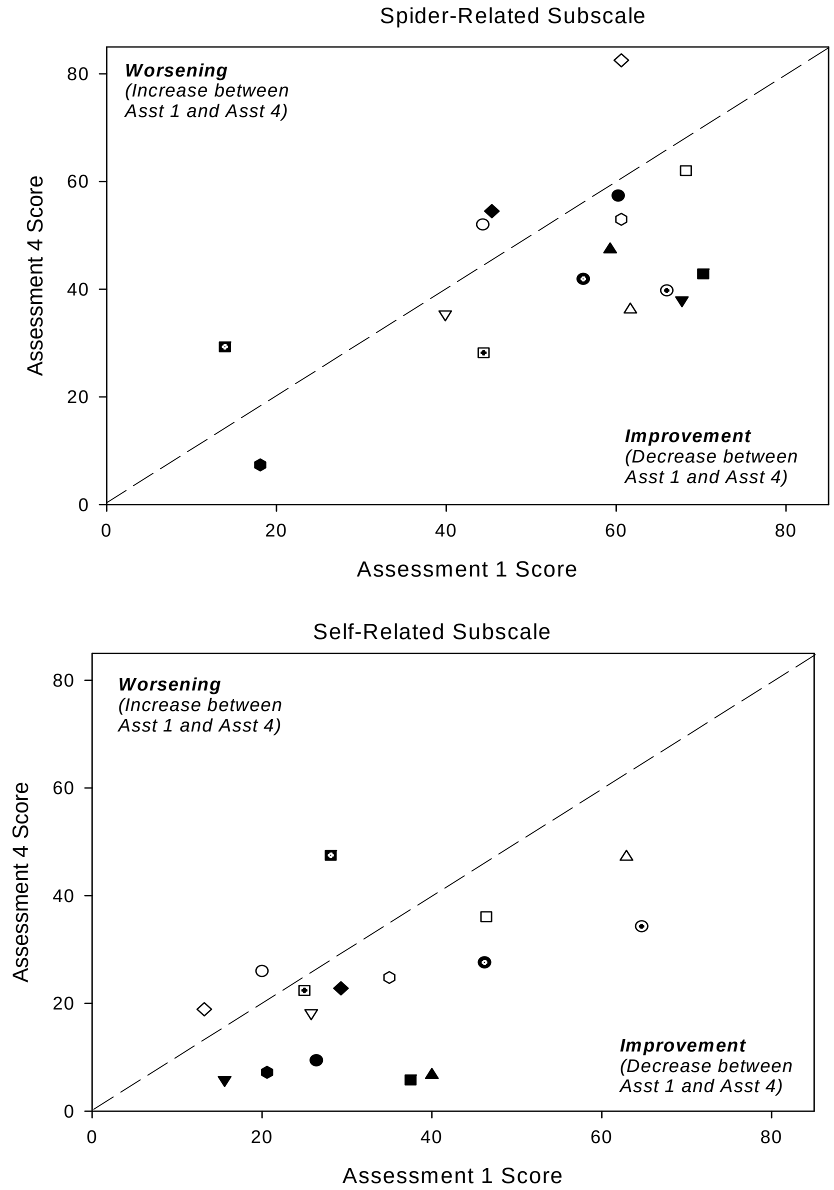

Figure 3.8. SBQ spider-related and self-related subscale score changes for each participant. Assessment 1 score plotted against assessment 4 score.

The figure shows that Karla’s data points on both scales show the greatest degree of worsening over time of any self-modelling participant. Out of the other pairs, on the spider-related subscale, four of the self-modelling participants showed greater decreases; one showed worsening, but less than their peer-model counterpart. Two members of the peer-modelling group showed better improvement than their self-model counterparts. On the self-related subscale, the self-modelling participants generally showed more improvement than their peer-model counterparts, except for Pair H.

3.5.2 The SBQ subscales

The SBQ was used because it provides detailed information ranging across nine subscales about the kind of beliefs held by spider-phobics. Figure 3.9 presents mean changes between assessments one and four for all SBQ subscales for the combined participants’ scores (excluding Pair F).

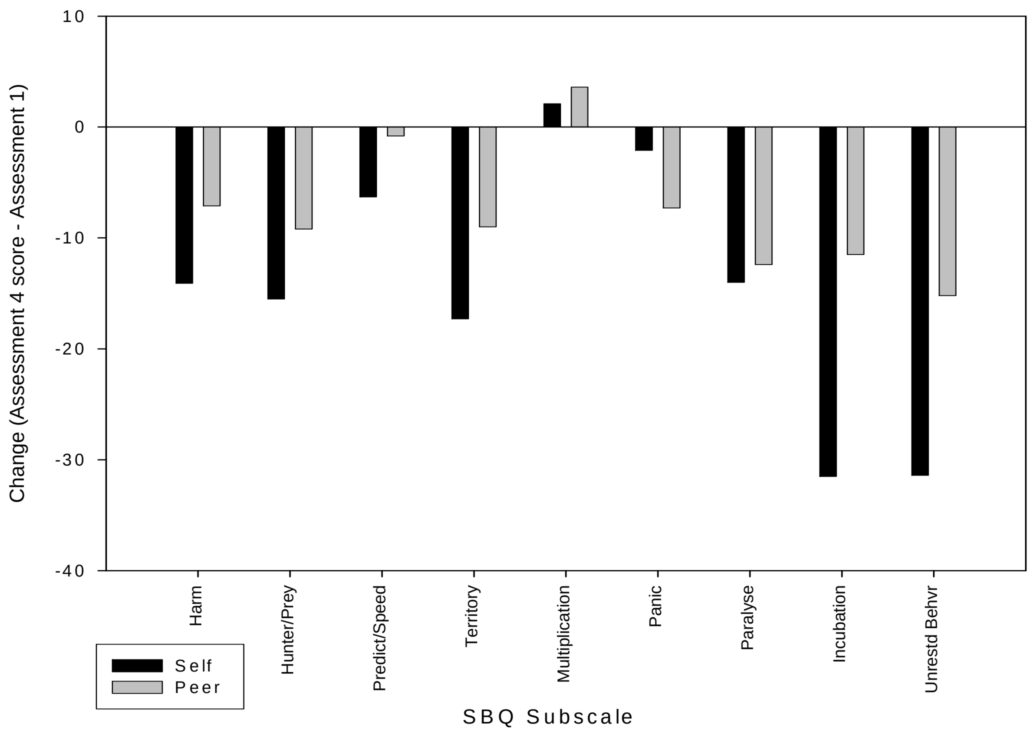

Figure 3.9. Changes in SBQ subscale mean scores (assessment 4 - assessment 1) across peer and self-modelling groups.

3.5.3(a) Spider-Related Beliefs[15].

The self-modelling group showed reductions on 4 out of 5 of these subscales. The peer-modelling intervention appeared also to reduce scores on these four subscales, however, for this group, the change on *Unpredictability* and *Speed* subscale was minor. The fifth subscale, *Multiplication,* increased after the interventions, although not by a great deal. As shown in Figure 3.2, self-modelling was generally more effective than peer-modelling at reducing these irrational spider–related fears measured by the subscales. Means, standard deviations and effect sizes are shown in Table 3.3.

[15] In Figure 3.2, the spider-related subscales are the first five subscales (*Harm* to *Multiplication*).

3.5.3(b)Self-Related Beliefs[16].

The peer-modelling intervention appeared to reduce scores on all four subscales. The self-modelling intervention also reduced phobic beliefs on these four subscales, but the reduction in *Panic* beliefs was minor. The self-modeling group showed greater reductions on three out of four of these subscales. The decreases on two of the subscales (*Incubation* and *Unrestrained Behaviour*) for the self-modelling group were rather larger than on all the other subscales, at approximately 30% of the total possible score. The peer-model group experienced similar reductions to the self-model group regarding the belief that they might be unable to move in a spider encounter *(Paralysis).*

Table 3.3

Mean Changes in all SBQ Subscales, Standard Deviations and Effect Sizes.

Change in Measure (Assessment 4 – Assessment 1)	**Mean**	**S.D.**	**Effect Size**
SBQ Harm mean (self)	-14.07	11.53	-0.68
SBQ Harm mean (peer)	-7.08	17.37	-0.36
Difference in Harm Subscale Change (self-peer)	-6.99	19.4	-0.47
SBQ Hunter/Prey mean (self)	-15.52	15.12	-0.92
SBQ Hunter/Prey mean (peer)	-9.22	21.78	-0.57
Difference in Hunter/Prey Subscale Change (self-peer-modelling)	-6.3	17.32	-0.34
SBQ Unpredictability/Speed mean (self)	-6.33	22.43	-0.30
SBQ Unpredictability/Speed mean (peer)	-0.82	15.21	-0.06
Difference in Unpredictability/Speed Subscale Change (self-peer)	-5.51	21.91	-0.29
SBQ Territory mean (self)	-17.35	16.66	-1.02
SBQ Territory mean (peer)	-8.98	21.11	-0.44
Difference in Territory Subscale Change (self-peer)	-8.37	15.83	-0.44
SBQ Multiplication mean (self)	2.14	21.72	0.09
SBQ Multiplication mean (peer)	3.57	21.91	0.12
Difference in Multiplication Subscale Change (self-peer)	-1.43	36.92	0.07
SBQ Panic mean (self)	-2.06	15.8	-0.11
SBQ Panic mean (peer)	-7.33	12.07	-0.72
Difference in Panic Subscale Change (self-peer)	5.27	21.74	-0.37
SBQ Paralysis mean (self)	-13.97	9.01	-1.22
SBQ Paralysis mean (peer)	-12.38	16.86	-0.57
Difference in Paralysis Subscale Change (self-peer)	-1.59	17.18	-0.12

[16] In Figure 3.2, the self-related beliefs are the last four subscales (*Panic* to *Unrestrained Behaviour*).

Table 3.3 (continued)

Mean Changes in all SBQ Subscales, Standard Deviations and Effect Sizes.

Change in Measure (Assessment 4 – Assessment 1)	**Mean**	**S.D.**	**Effect Size**
SBQ Incubation mean (self)	-31.53	8.28	-2.06
SBQ incubation mean (peer)	-11.53	16.22	-0.52
Difference in Incubation Subscale Change (self-peer)	-20	20.82	-0.78
SBQ Unrestrained Behaviour mean (self)	-31.43	18.52	-1.81
SBQ Unrestrained Behaviour mean (peer)	-15.18	19.56	-0.74
Difference in Unrestrained Behaviour Subscale Change (self-peer)	-16.25	24.08	-0.85

Means, standard deviations and effect sizes are shown in Table 3.3. It can be seen from the table that the standard deviations again seem to be large compared to the mean changes, though this pattern is generally limited to the peer-modelling participants and the difference within pairs. On all the subscales except *Multiplication* and *Panic* (where the self-modelling group showed little change) the standard deviations are all smaller than the mean changes. Overall this data indicates that generally there was a wide variability in change over the course of the experiment except for when the self-modelling group showed a sizeable decrease, in which case the change was more consistent among these participants.

3.6 Self-Reported Spider-Phobic Symptoms: The FQ

3.6.1 Total FQ scores

Overall, the mean FQ scores, shown in Figure 3.10, show a generally decreasing trend for both peer and self-modelling groups. The self-modelling group initially scored higher than the peer-modelling group on phobic symptoms, and decreased more, so that the two groups scored identically at follow-up. The peer-modelling group mean decreased by 11% of the maximum possible FQ score (S.D. = 18 %, Effect size = 0.65), and the self-modelling group mean decreased by 16% of the maximum possible FQ score (S.D. = 13%, Effect size = 1.32).

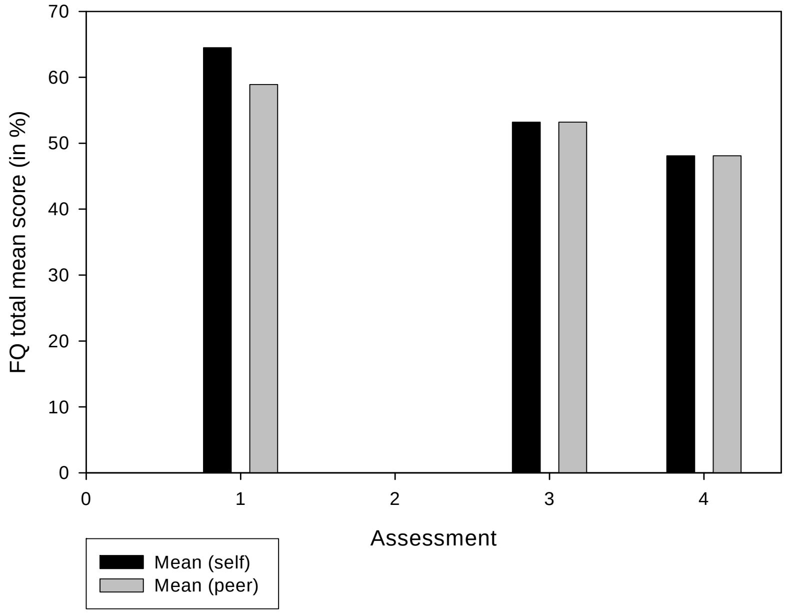

Figure 3.10. FQ total mean scores across peer and self-modelling groups

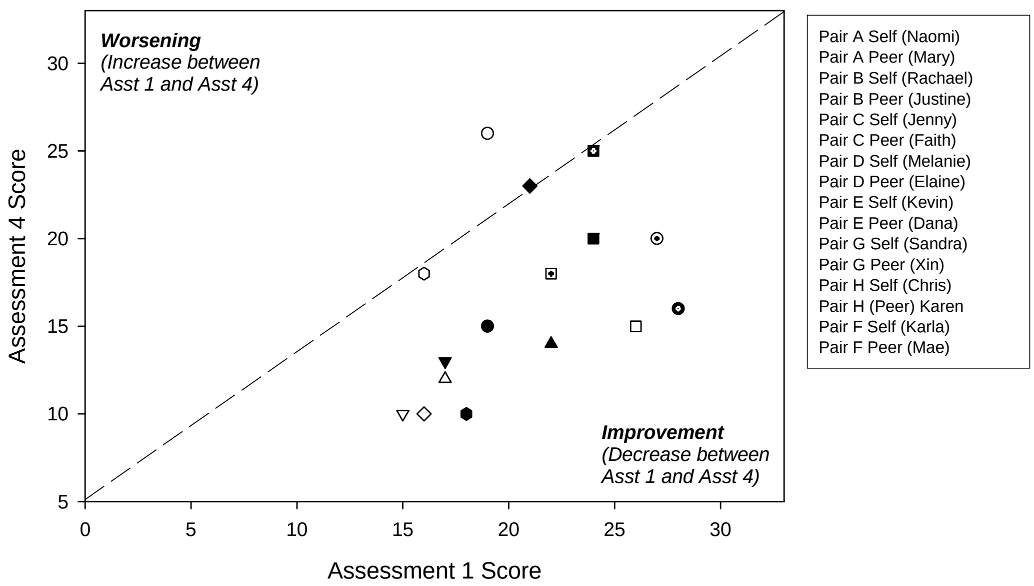

Figure 3.11. Individual variation in FQ score changes across participants.

Figure 3.11 shows the individual variation among participants in FQ changes. It can be seen that all of the self-modelling participants, even Karla, are close to the diagonal or show improvement. The peer-modelling participants fared slightly worse although there was not a marked difference, except for Mary, who scored considerably higher at assessment 4.

3.6.2 The FQ subscales

Figure 3.12 shows the overall mean reductions across the three FQ subscales. It can be seen from the data that the mean scores of both groups on all the subscales were reduced over the course of the experiment. The self-modelling group showed more of a reduction on two out of the three subscales (*Vigilance* and *Preoccupation*.) The peer-modelling group showed more of a reduction on the *Avoidance/Coping* subscale. The largest difference between the two groups was on the *Vigilance* subscale. Means, standard deviations and effect sizes are shown in Table 3.4.

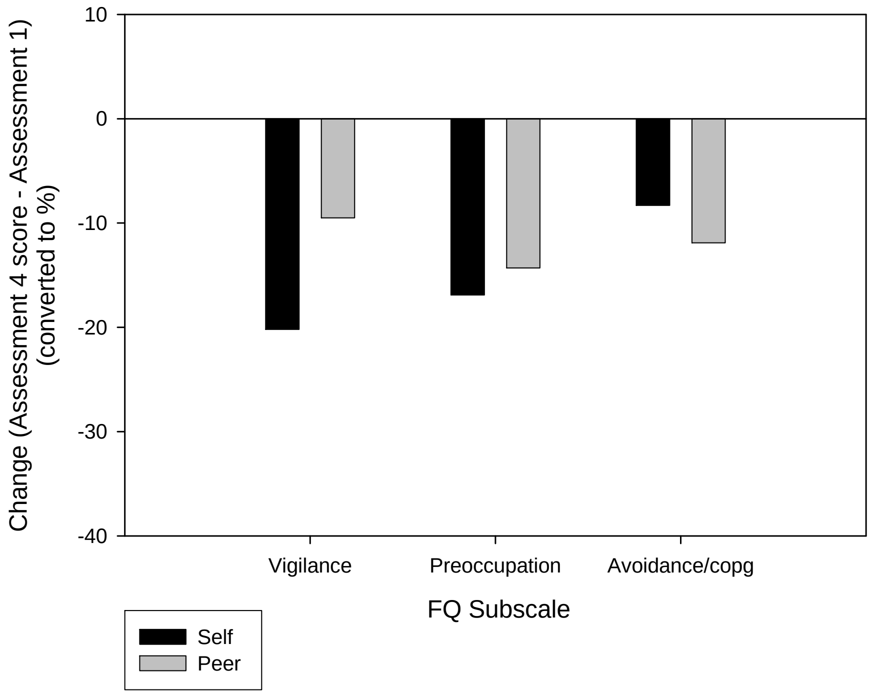

Figure 3.12. Change in FQ subscale mean scores (assessment 4 - assessment 1) across peer and self-modelling groups.

Table 3.4

Mean Changes in FQ Score, Standard Deviations and Effect Sizes.

Change in Measure (Assessment 4 – Assessment 1)	**Mean**	**S.D.**	**Effect Size**
FQ Vigilance mean (self)	-2.43	2.44	- 0.82
FQ Vigilance mean (peer)	-1.14	2.48	-0.57
Difference in Vigilance Subscale Change (self-peer)	-1.35	3.3	-0.52
FQ Preoccupation mean (self)	-1.86	2.19	-0.84
FQ Preoccupation mean (peer)	-1.57	1.62	-0.92
Difference in Preoccupation Subscale Change (self-peer)	-0.32	3.04	-0.15
FQ Avoidance/Coping mean (self)	-1	2.24	-0.51
FQ Avoidance/Coping mean (peer)	-1.43	1.13	-0.75
Difference in Avoidance/Coping Subscale Change (self-peer)	0.5	2.88	0.24

Table 3.4 shows that once again the standard deviations were large compared to group mean changes. Therefore the changes in FQ were highly variable between participants in both groups.

3.7 Self-Reported Generalised Self-Efficacy: The GSES.

Figure 3.13 shows the mean GSES scores across the three assessments in which it was administered to the participants. The self-modelling group scored slightly higher than the peer-modelling group at baseline, post-treatment and follow-up. Overall, there was little difference between initial and follow-up scores on the GSES for both groups. The self-modelling group increased by 2% of the maximum possible score (S.D. = 8%; Effect size = 0.32). The peer-modelling group increased by 4% of the maximum possible score (S.D. = 5%; Effect size = 0.27). The average difference between the participants within each pair was a greater increase for the peer-modelling participants of 2% of the maximum possible total score on the measure (S.D. = 10%; Effect size = 0.28).

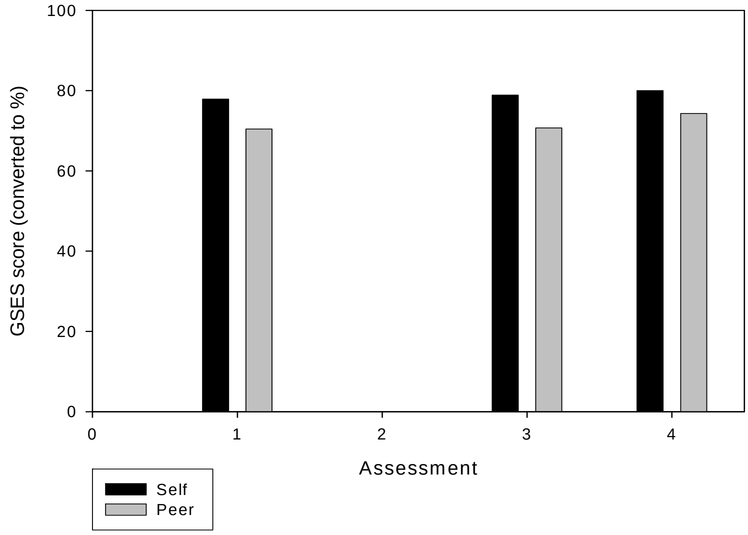

Figure 3.13. Total GSES score (in %) across self and peer-modelling groups.

3.8 Changes in self-efficacy strength and level in relation to changes in performance on the BAT

Pearson product-moment correlations were calculated to show how closely the self-efficacy and strength levels matched the BAT scores for all the pairs except F. The results are shown in Table 3.5.

Table 3.5.

Pearson Product-Moment Correlations between BAT and Various Self-Efficacy Measures.

Self-Efficacy Measure	Correlation (r) with BAT level achieved on all assessments	Probability (p)
Self-Modelling Group		
Video Self-Efficacy Strength	**0.50**	**<0.05**
Everyday Self-Efficacy Strength	0.40	*NS*
BAT Self-Efficacy Strength	**0.85**	**<0.001**
Overall Self-Efficacy Strength	**0.70**	**<0.01**
Self-Efficacy Level	**0.75**	**<0.01**
Peer-Modelling Group		
Video Self-Efficacy Strength	0.35	*NS*
Everyday Self-Efficacy Strength	0.28	*NS*
BAT Self-Efficacy Strength	**0.63**	**<0.01**
Overall Self-Efficacy Strength	**0.55**	**<0.05**
Self-Efficacy Level	**0.55**	**<0.05**
Both Groups		
Video Self-Efficacy Strength	0.43	*NS*
Everyday Self-Efficacy Strength	0.34	*NS*
BAT Self-Efficacy Strength	**0.78**	**<0.001**
Overall Self-Efficacy Strength	**0.63**	**<0.01**
Self-Efficacy Level	**0.66**	**<0.01**

As Table 3.5 shows, there are a considerable number of strong positive correlations between BAT performance and self-efficacy strength and level measures. Large correlations are shown in bold type[17]. The large correlations with BAT self-efficacy strength, overall self-efficacy strength and self-efficacy level were found for each group individually and for both together. It is also noticeable that the correlations are larger in the self-modelling group, with video self-efficacy also strongly correlating with BAT performance. The correlation between overall self-efficacy strength and

[17] The convention used for Pearson product-moment correlations was 0.5 = large; 0.3 = medium; 0.1 = small; as per Cohen (1988).

BAT performance is shown graphically in Figure 3.14. Figure 3.15 shows the correlation between BAT performance and self-efficacy level.

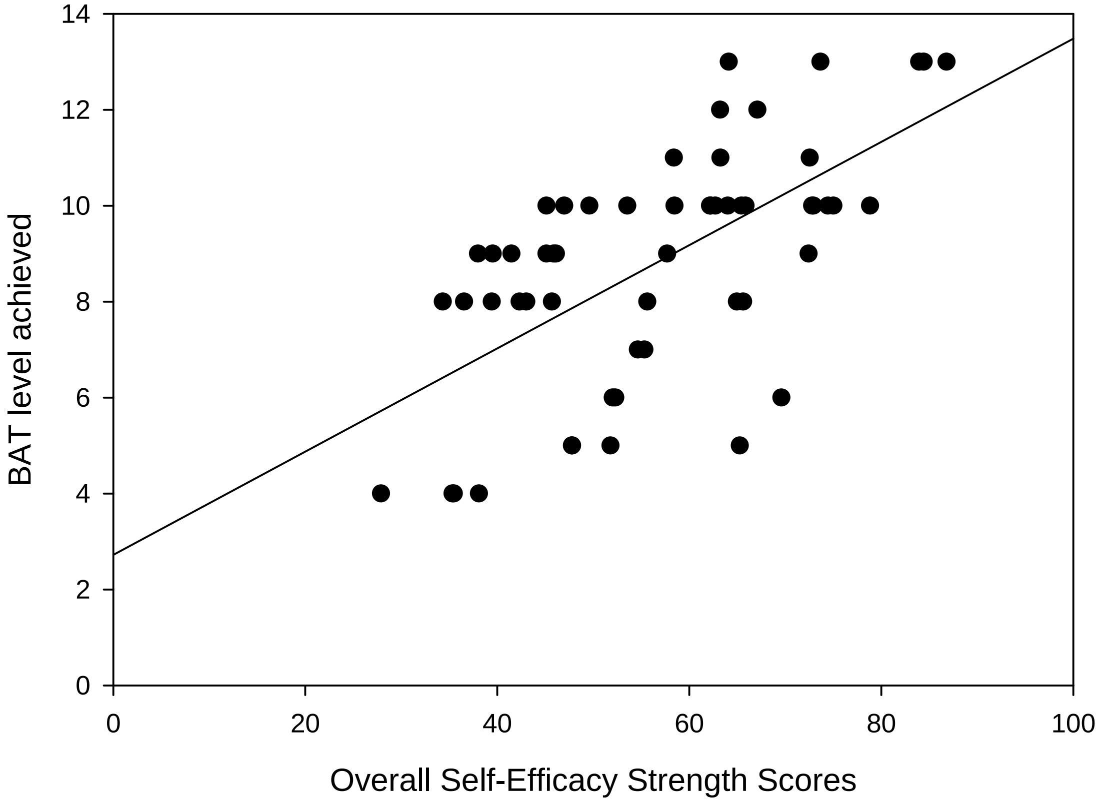

Figure 3.14. Overall self-efficacy strength scores for all participants (excluding pair F) plotted against BAT performance (over assessments 1 to 4).

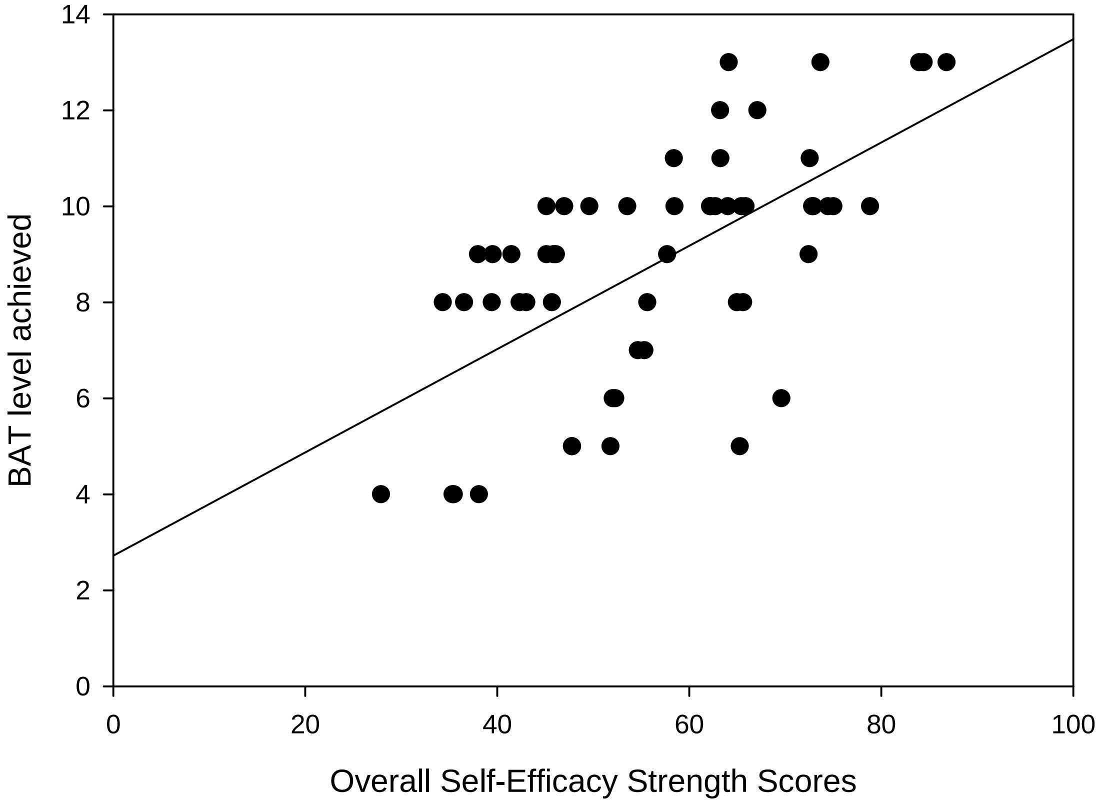

Figure 3.15. Overall self-efficacy level scores for all participants (excluding pair F) plotted against BAT performance (over assessments 1 to 4).

3.9 Changes in Subjective and Physiological Indicators of Anxiety: SUDS and Heart Rate.

3.9.1 SUDS

3.9.1 (a) Changes in group mean SUDS.

Figure 3.16 shows the mean change in SUDS for the two groups[18]. It can be seen from the results that the self-modelling group, on average, reported a SUDS rating of approximately 7.5 at the most stressful point in the BATs at baseline and post-treatment assessments, and that this dropped at the follow-up assessment. The overall change for this group was a decrease of 0.86 (S.D. 1.84, Effect size = -0.62). However, after a stable baseline average of approximately 6 on the SUDS, the peer-modelling group mean SUDS rating increased to slightly over 8, although this decreased slightly at follow-up. The overall difference between follow-up assessment mean SUDS rating and assessment 1 mean SUDS rating for this group was an increase of 1.71 (S.D. 2.77, Effect size = 0.76). The difference between individuals, on average, was a greater decrease in SUDS by 2.57 points for the self-modelling participants (S.D. = 3.82, Effect size = -1.09).

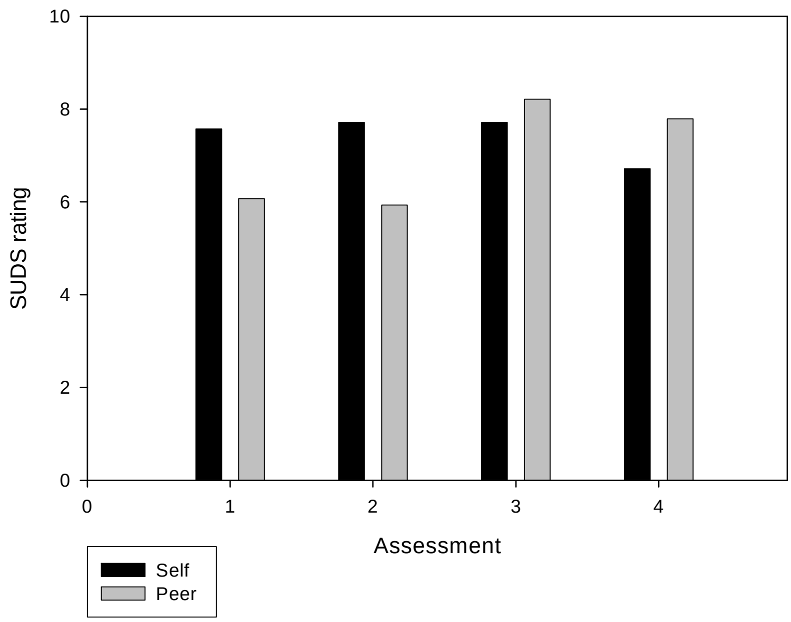

Figure 3.16. Mean SUDS ratings across four assessments.

[18] The data for each participant on subjective and physiological measures of anxiety are shown in Appendix L.

3.9.1(b) Changes in individual SUDS.

Figure 3.17 shows SUDS ratings for each participant during laboratory assessments and treatment video viewings.

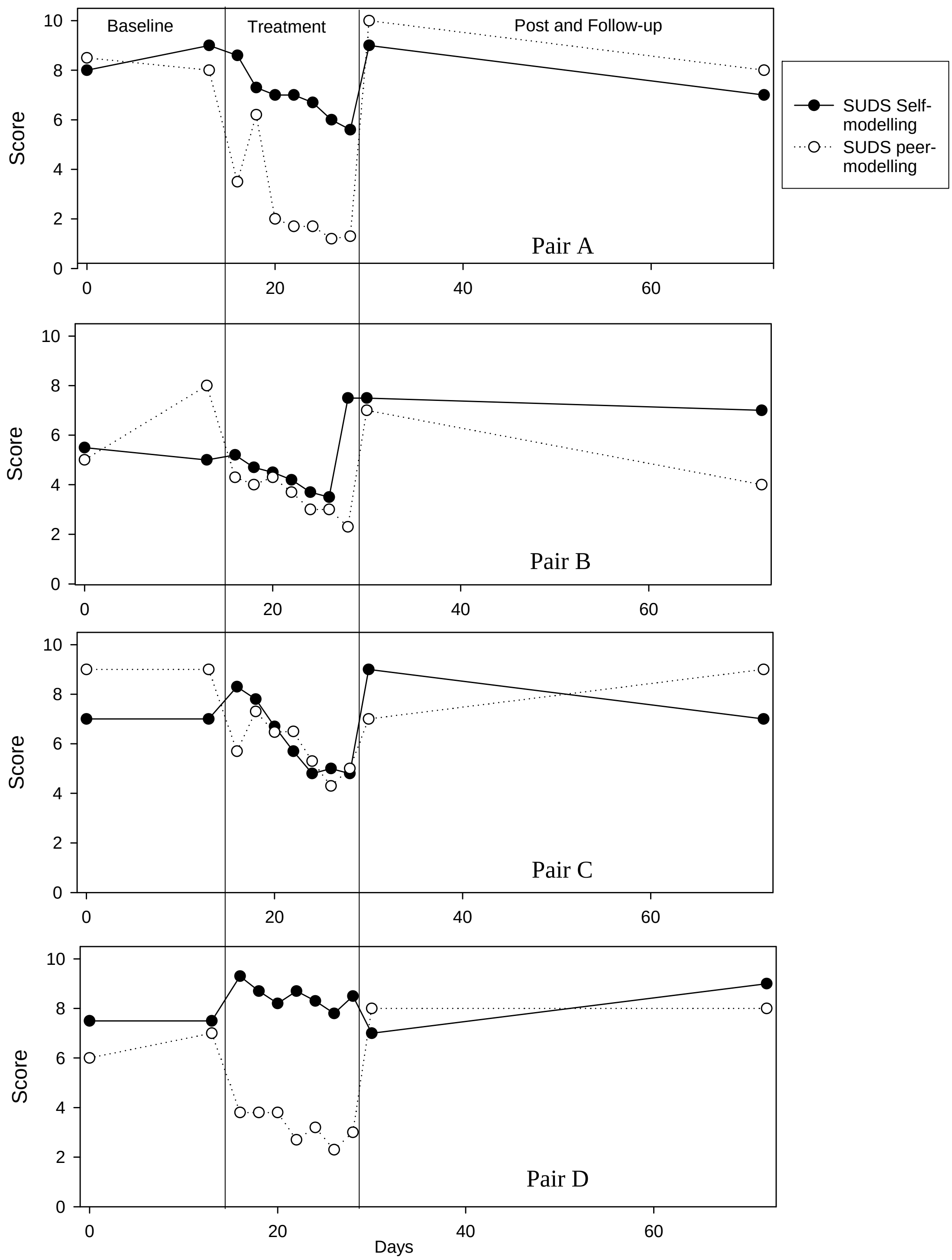

Figure 3.17. SUDS scores for each pair of participants.

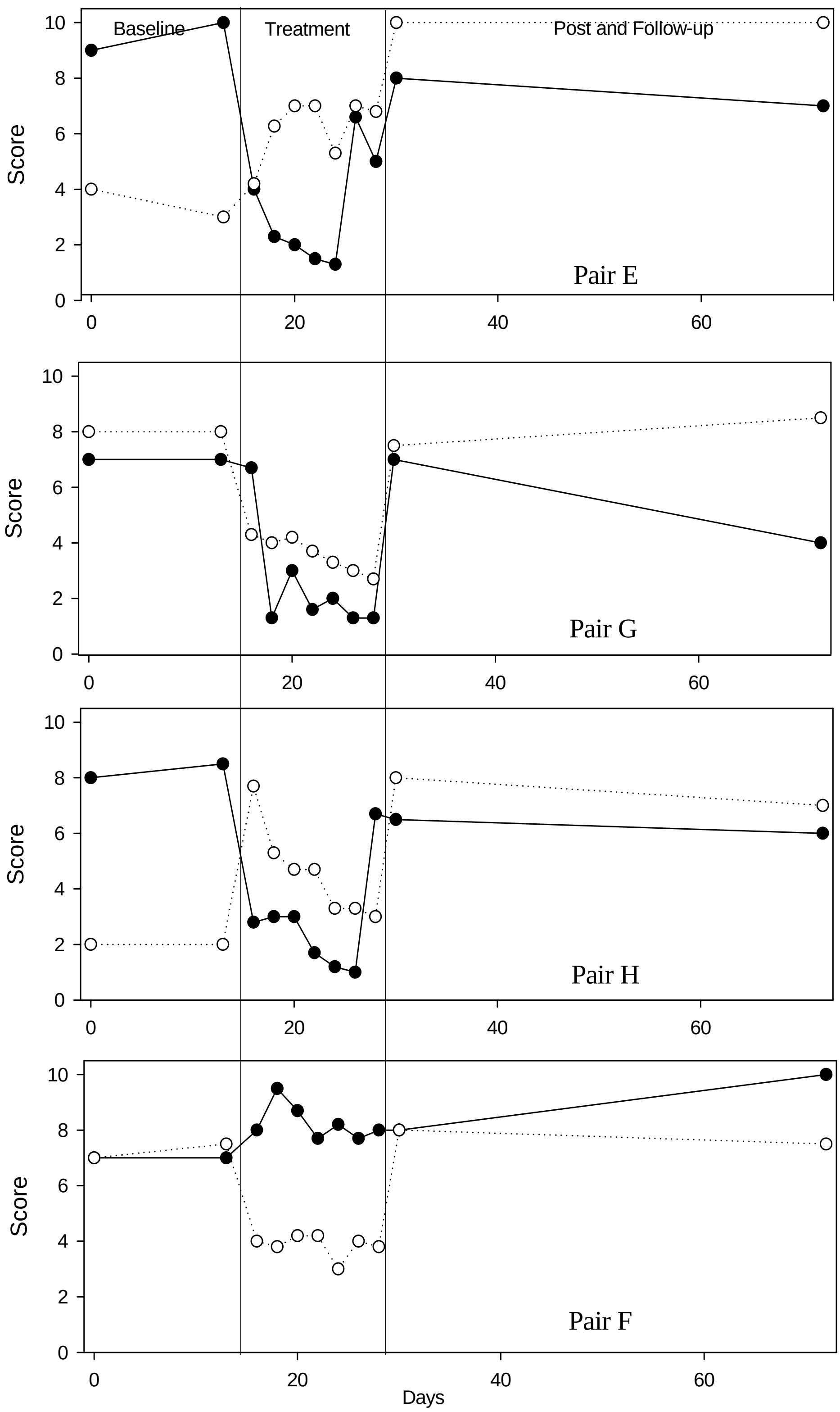

Figure 3.17 Continued. SUDS scores for each pair of participants.

In both groups, all participants generally showed relatively stable baselines. Most participants went on to report lower SUDS during the treatment phase, indicating that they found the video scenes generally less distressing than the live BAT exposures at baseline. It was notable that several participants actually reported more distress at some point during this phase than they had during the baseline BATs. The participants were Rachael (B), Jenny (C), and Melanie (D) in the self-modelling group and Dana (E) and Karen (H) in the peer-modelling group.

After treatment, Naomi (A), Kevin (E), Sandra (G) and Chris (H) in the self-modelling group, and Justine (B), Faith (C), and Karen (H) in the peer-modelling group returned to baseline or lower levels by follow-up. Rachael (B) and Melanie (D) in the self-modelling group reported higher SUDS at follow-up than they did at baseline. Jenny (C) initially reported higher SUDS at assessment 3 and returned to baseline at follow-up. Dana (E) and Karen (H) in the peer-modelling group also showed increases at follow-up. Mary (A) showed an increase at assessment 3 but returned to baseline at follow-up. Xin (G) reported slightly more than baseline SUDS at follow-up. With some slight variation, therefore, it appeared that the participants who reported higher SUDS than baseline while watching the treatment videos were the same ones that reported higher SUDS than baseline when back in the laboratory at follow-up.

In Pair F, Karla also reported higher SUDS in both the treatment phase and the post-treatment and follow-up assessments than she did at baseline. Mae reported lower SUDS during treatment than at baseline, and equal to baseline levels at follow-up.

3.9.2 Change in Heart-Rate (HR)

Figure 3.18 shows the mean change in HR difference scores (the difference between resting HR and HR immediately after the conclusion of the BAT in beats per minute [bpm] for the two groups.) These difference scores indicated how much each participant's HR was accelerated from its normal resting point by the experience of the BAT. It can be seen from the results that the self-modelling group, on average, showed a very unstable level of change in HR between resting and post BAT over the baseline period, showing a large increase at assessment 2. After treatment, the HR difference score dropped to slightly below initial levels, a total decrease of 1.86 bpm (S.D. = 12.46, Effect size = 0.18). The peer-modelling group mean, in contrast, showed a more stable baseline, and an increase at post-treatment, falling by follow-up to exactly initial levels (S.D. = 18.18). The average difference between self and peer-modelling participants was therefore just the decrease of 1.86 bpm shown in the self-modelling group (S.D. = 23.98, Effect size = -0.11).

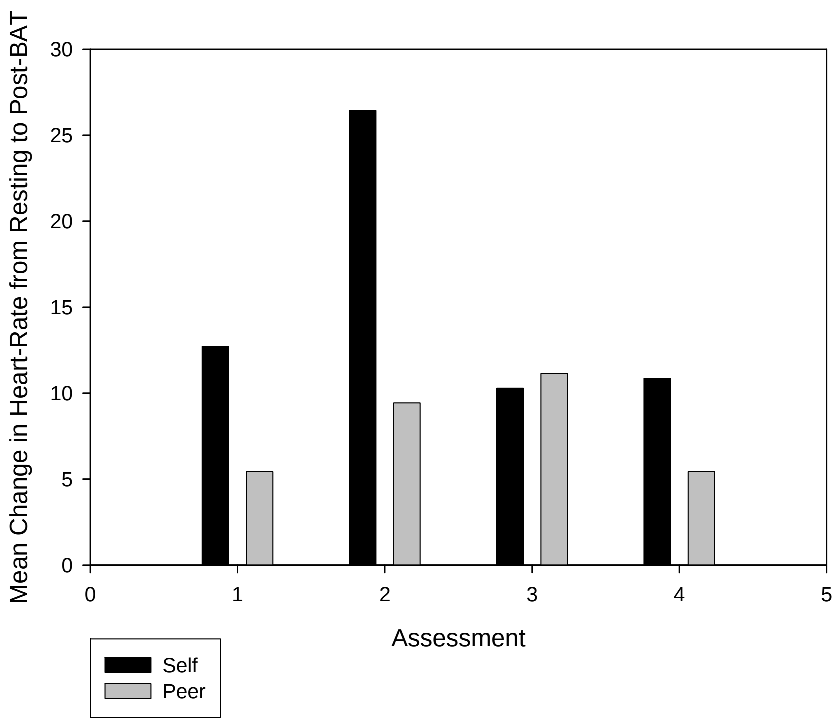

Figure 3.18. Heart-rate changes across four assessments.

The mean results do not show the large variation that occurred in HR difference scores between assessments for many of the participants. Each participant's difference scores are displayed in Figure 3.19.

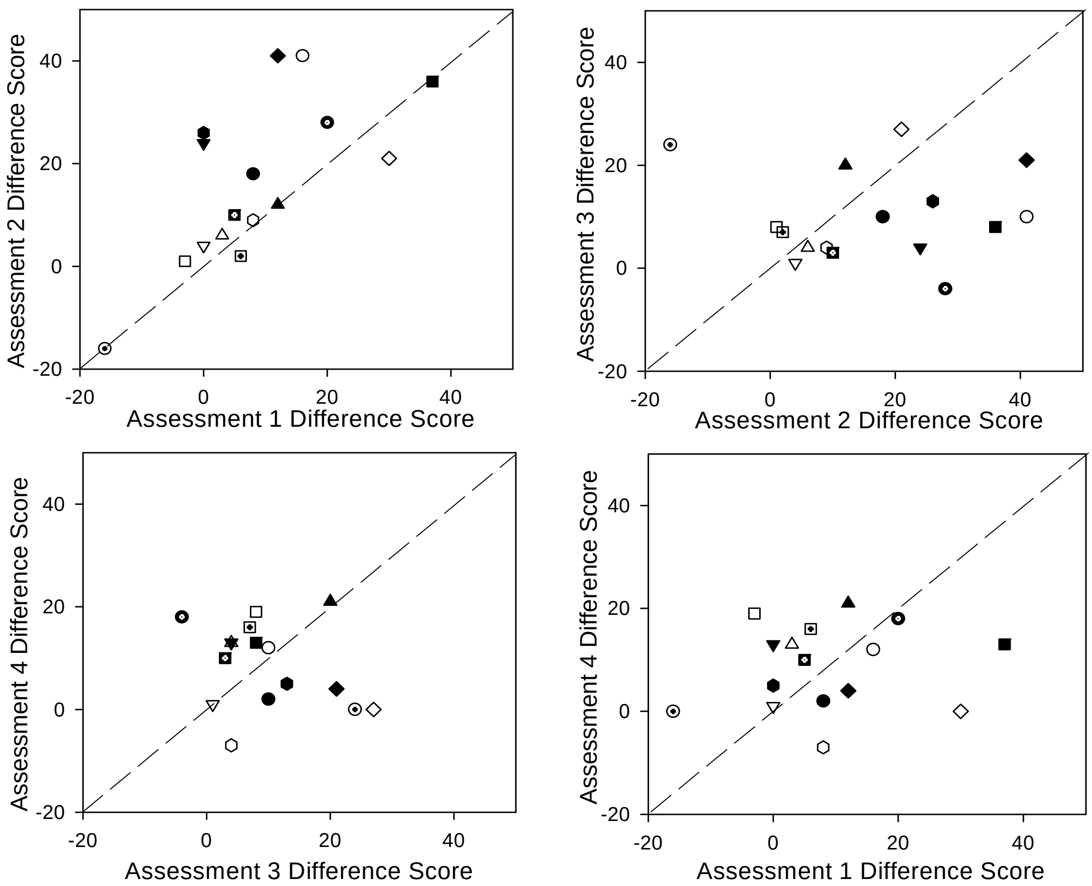

Figure 3.19. Individual variation in HR difference score changes between each assessment across participants.

It can be seen from Figure 3.19 that there was a high degree of variation between participants' scores from assessment to assessment. The figure shows that the self-modelling group mean showed such a large difference between assessments 1 and 2 mostly because of variation shown by only three of its members: Kevin, Sandra, and Melanie. Between assessments 2 and 3, however, the self-modelling participants clearly showed the most decreases in difference scores. This was due to two things: Kevin Sandra and Melanie dropped back down towards their assessment 1 levels, and two more self-modelling participants, Rachael and Chris, showed big decreases, after remaining stable between the first two assessments. Between the last two assessments, the self-modelling participants showed both sizeable increases and decreases.

Among the peer-modelling participants, between the first two assessments there was little variation, except for a large increase by Mary. Between assessments 2 and 3, most participants remained stable; Mary showed a large decrease back to initial levels; and Karen, stable at the earlier assessments, showed a very large increase. Between the last two assessments, Mary showed a large decrease; and Xin and Dana, who had previously remained relatively stable, showed large decreases.

CHAPTER 4

Discussion

The results of Pair F will be discussed separately due to the atypical responses of the self-modelling participant, Karla, to treatment. The results of the seven other pairs will be discussed in terms of the six hypotheses of the study. The hypotheses proposed in the study were that:

1) Both interventions would produce increases in self-efficacy level and strength, but video self-modelling would produce greater increases than video peer-modelling.

2) Both interventions would produce decreases in avoidance as shown by increases in performance on the approach measure, or BAT, but self-modelling would show greater increases on this measure than video peer-modelling.

3) Both interventions would produce decreases on self-report measures of spider-phobic beliefs and symptoms, but video self-modelling would produce greater decreases than video peer-modelling.

4) Generalised self-efficacy would not change as a result of either intervention.

5) Changes in self-efficacy strength and level would closely relate to changes in performance on the BAT during each intervention.

6) Both interventions would produce decreases in self-reported anxiety (SUDS) and physiological indicators of anxiety (HR), but self-modelling would produce greater decreases than video peer-modelling.

4.1 Summary and Interpretation of the Results for all Pairs except F.

4.1.1 Hypothesis 1

4.1.1(a) Self-efficacy strength.

The results showed that over the course of the experiment, both those who had received peer-modelling and those who had undergone self-modelling, on average, reported stronger beliefs that they could successfully execute the behaviours depicted on the video, required in the BAT, and described in a list of everyday encounters with spiders. Further, these increases in self-efficacy strength were larger for the self-modelling group, with large effects[1] being shown for both groups and between self and peer-modelling participants for most measures. These results thus support Hypothesis 1.

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[1] Whenever reference is made in the discussion to the size of effects, Cohen's conventions have been used (as a guideline only, as the effect sizes regarding change within a group over time are not strictly Cohen's *d*). According to these conventions, 0.8 is a large effect size; 0.5 is a medium effect size; and 0.2 is a small effect size.

The group mean results show that after the baseline phase the difference between self and peer-modelling becomes quite marked for all the measures except BAT self-efficacy. These differences first appear after the conclusion of the different treatments (i.e., at assessment 3) which were all carried out at different times by the participants. This supports the conclusion that the difference occurred because the self-modelling videos were more effective at enhancing video, everyday and overall self-efficacy strength. It should also be noted that the self-modelling group continued to show a marked increase in self-efficacy strength measures between post-treatment and follow-up, suggesting that further increases may have occurred after the conclusion of the experiment.

The data for each individual pair on the video, everyday, and overall self-efficacy measures show that the self-modelling participants usually experienced more increases in self-efficacy strength than the peer-modelling participants. In the case of BAT self-efficacy strength, the participants in each pair that showed the most change were equally distributed between the groups.

All of these findings are in line with previous studies (e.g., Holman, 1991; Bradley, 1993; Öst et al, 1997) which found that both self and peer video modelling increase self-efficacy to some extent. The findings are also predicted from Bandura's (1986, 1997) social cognitive theory. According to the theory, the modelling interventions used the vicarious source of self-efficacy information to strengthen self-efficacy beliefs, in this case, the belief that one can cope with the spider as seen in the video, in everyday situations, and in the BAT.

Both interventions produced enhanced self-efficacy strength because they adhered to Bandura's (1986) description of the four processes involved in modelling. Both modelling interventions maximized attention by providing salient and discriminable examples of coping behaviours in spider encounter situations. These were functionally valuable in that the participants all wanted to be able to cope with spiders more effectively. Further, the models were all presented in the attractive and interesting video medium. Retention was enhanced by presenting the modelled examples seven times over two weeks. Production processes were largely left to the participants, as it was assumed that the participants possessed the cognitive ability to process the modelled examples and, in a process of abstraction, generalize the rules to other situations. The motivation to perform the more adaptive behaviours was assumed to exist in each participant's wish to alleviate their phobic symptoms.

The self-modelling intervention produced superior enhancements of self-efficacy strength compared to peer-modelling. According to social cognitive theory, the stronger effects occurred because several factors affecting the modelling processes were optimised only in the self-modelling intervention. The intervention allowed the maximum possible similarity between observer and model. This made the observed behaviour more personally relevant and thus increased the level of attention the self-modelling participants paid to the video scenes (Bandura, 1997; Dowrick, 1999). It also maximized the impact of the vicarious source of self-efficacy information by preventing any inferences being made during the social comparison which usually takes place when the observer watches a model (Bandura, 1997).

BAT self-efficacy strength was not enhanced by a much greater degree after self-modelling compared to after peer-modelling. However, this is explained by the fact that the participants in both groups were receiving self-efficacy information about the BAT from the source which Bandura (1997) proposes as being the most powerful: enactive mastery experiences. Much research has shown that interventions which involve an enactive mastery component produce superior results to the vicarious experience of modelling alone (e.g., Bandura, Jefferey & Gadjos, 1974; Öst, Ferebee & Furmark, 1997). The experiences that all the participants underwent during the BATs in each assessment would have been a more powerful influence on their self-efficacy. Thus, the expected effect would be to enhance BAT self-efficacy strength to approximately the same degree in both groups.

At first glance, it appears that the problem in the analysis remains that in the self-modelling group, enactive experiences plus the added component of self-modelling should have increased BAT self-efficacy in this group over and above the gains made by the peer-modelling group. However, the finding that there was little difference between the two groups may have been because the experiences of encountering the live spider in the baseline BATs made it easier for the peer-modelling participants to visualise themselves coping in the BAT situation during each video viewing. This may have lessened the loss of effectiveness that would usually be predicted to occur after peer-modelling due to inferences made in the process of social comparison.

This explanation seems all the more likely when one considers that both groups showed equivalent increases on the BAT self-efficacy measure, whereas the peer group did not show as much increase on the other measures. This may have been because both groups had their BAT self-efficacy strength influenced to some degree by successful performance experiences on the BATs, whereas enactive sources of self-efficacy information regarding the situations described in the everyday and video measures were not available to the participants (unless relevant experiences occurred in their lives outside the experiment).

The finding that video self-efficacy was enhanced the most after self modelling, and that the difference between the two groups was the largest on this measure, is not surprising because the measure consisted of items specifically about scenes shown on the video. This is where one would expect the strongest difference between self and video modelling. The predicted effect of self-efficacy enhancement would not have been weakened through generalization to other situations.

The everyday and overall measures of self-efficacy strength were again higher for the self-modelling group, but there was not as much difference between the groups as that shown on the video self-efficacy measure. This may be explained by the fact that these measures contained questions about situations that were not depicted in the video. Thus, it seems that the self-efficacy enhancements shown after video self-modelling do not generalise perfectly to other situations, and are weaker when the situations have not been modelled for the observer.

A further finding of note was that the self-modelling group showed much less variability in self-efficacy strength changes than the peer-modelling group, suggesting that self-modelling produced more consistent improvements on these measures.

4.1.1(b) Self-efficacy level.

The results showed that, over the course of the experiment, self-efficacy level increased by exactly two BAT steps for the self-modelling group (and continued to show increases between post-treatment and follow-up) and 0.71 BAT steps for the peer-modelling-modelling group. Therefore both groups increased somewhat in self-efficacy level and the self-modelling group increased more than the peer-modelling group, which supports Hypothesis 1.

Self-modelling seemed to produce a more consistent increase in self-efficacy level than peer-modelling. The peer-modelling group contained one participant who increased 8 points, and three who actually decreased. The self-modelling group members all either increased or stayed at the same level.

It is noticeable, however, that the effect sizes showing (a) the average difference within each pair, and (b) the change between assessments 1 and 4 for the self-modelling group, are not as high as those that occurred for self-efficacy strength increases.

The self-efficacy level measure was calculated using self-efficacy strength scores of 20% or more on the BAT self-efficacy strength measure. Therefore, the cause of (a) is likely to be the same as that which caused BAT self-efficacy strength increases to be similar for both groups: experiences during the BATs served to equalise both groups.

Finding (b) can be interpreted as being caused by the fact that over the course of the experiment, due to both enactive mastery experiences and modelled successes, there was a strong enhancement of the self-modelling participants' certainty that they could again achieve the steps on the BAT they had already achieved at baseline, but a weaker enhancement of their belief that they could advance further along the BAT. This is to be expected as enactive experiences had already shown the participants that they could achieve the earlier steps, and the video strengthened these beliefs. Proceeding further was more daunting; as only the video depicted this possible future, there had been no real-life experiences to support the beliefs.

4.1.2 Hypothesis 2

The results showed that both groups showed increases on the BAT, progressing approximately 3 points further. The difference between the two groups was minor, with the self-modelling group improving slightly more, although the effect was very small. The effects for both groups were larger, with the peer-modelling group showing a considerably larger effect than the self-modelling group. Therefore, the results only partially supported Hypothesis 2, insofar as both groups showed improvements.

However, the peer-modelling group showed approximately equal improvement in score on the BAT, and a larger effect, which does not support the hypothesis.

The finding that both groups showed approximately equal increases in BAT performance accords with the finding that BAT self-efficacy strength was raised to approximately the same degree in both groups, but is not predicted from the different increases in self-efficacy level across both groups. This may be explained by the imprecision of the self-efficacy level measure (discussed in section 4.1.5).

Although the mean data does not fully support the hypothesis, a closer look at the individual cases shows some important evidence to the contrary. One important point of difference between the two groups is that the highest scorers from both groups achieved quite different final levels at follow-up. Out of the peer group, the four highest scores initially were 10, 8, 8 and 8. These increased to 11, 10, 10, and 10 respectively at follow-up. Only one peer-modelling participant could let the spider out of the container. In contrast, the four highest of the self-modelling group started with scores of 10, 9, 9, and 8. These elevated to 13, 13, 10 and 13 at follow-up respectively. One of the participants expressed willingness to proceed to step 14 (holding the spider for 20 seconds) but the experimenter had to stop the assessment as the spider had fallen off the table and had 'frozen' in defence. Thus, at follow-up, three out of the top four in the self modelling group could touch the spider with a finger, quite an achievement for people who had entered themselves in a study because of their fear of spiders. It appears that the mean changes which showed approximately equal improvement in BAT score between the groups hide the evidence that, in the cases where most effectiveness was shown, self-modelling actually produced more clinically significant improvements than peer-modelling.

4.1.3 Hypothesis 3

4.1.3(a) Self-reported spider-phobic beliefs: The SBQ

The results showed that, over the course of the experiment, both those who had received peer-modelling and those who had undergone self-modelling, on average, reported fewer spider-related and self-related beliefs on the SBQ. Further, these effects were larger and more consistent for the self-modelling group. These results thus support Hypothesis 3. Both interventions appeared to be more effective at reducing self-related phobic beliefs. The difference in effectiveness between the two interventions was more pronounced for self-related beliefs than for spider-related beliefs.

The findings that self-modelling and peer-modelling both reduced spider-phobic beliefs are in line with Bandura's (1986, 1997) social cognitive theory. He asserts that people who have a phobia have developed maladaptive beliefs about themselves (including self-efficacy beliefs) and the environment (including the likely behaviour, predictability and controllability of spiders). The person develops a phobia because they believe that their coping abilities are not sufficient to match the aversive qualities and potentially aversive behaviours of spiders. Therapeutic interventions, such as modelling, strengthen self-efficacy beliefs and reduce symptoms.

According to this perspective, the modelling interventions strengthened the participant's belief that they could cope with the spider and control themselves in an exposure situation. The video also depicted the spiders as being controllable and predictable. This weakened the participants' belief that the spider might act in a harmful or aversive way to some extent.

The self-related items included beliefs such as becoming paralysed with fear (*Paralysis)*, having their fear and symptoms worsen after exposure (*Incubation*), and losing control of themselves (*Unrestrained Behaviour*). These are essentially all beliefs about one's lack of coping self-efficacy in a spider encounter situation. For this reason, in line with the improvements in the measures of specific self-efficacy strength and level, the strength of these beliefs was reduced over the course of the experiment due to enactive and vicarious experiences.

The finding that self-modelling reduced the spider-phobic beliefs more than peer-modelling can be predicted by the finding that the self-modelling participants experienced a greater increase in their self-efficacy strength and level. This confirms that seeing oneself, rather than somebody else, dealing effectively with spiders is more effective at boosting self-efficacy (and reducing beliefs that one cannot cope during exposure to the phobic object).

An analysis of the correlations between the decreases in self-related phobic beliefs and the increases in overall self-efficacy strength for each participant shows the degree of congruence between these two measures that the theory predicts. Four out of seven participants in the self-modelling group showed correlations between -0.76 and -0.99. The other three participants showed weaker correlations or no correlations ($r = -0.41$ to 0.01); (95% CI: $-0.99 \leq -0.59 \leq -0.19$). In the peer-modelling group, four out of seven participants showed correlations between -0.91 and -0.99, the other participants showed variable positive correlations ($r = 0.56$ to 0.99); (overall, 95% CI: $-1.00 \leq -0.23 \leq 0.63$). The patterns of correlations show that although participants in both groups show strong correlations, the self-modelling group showed the strongest and most consistent relationship between self-efficacy enhancement and decreases in self-related phobic beliefs.

The interventions, particularly self-modelling, were more successful at weakening maladaptive self-related beliefs than spider-related beliefs. This finding is in line with social cognitive theory, in that the central therapeutic mechanism theorised to occur during modelling is an increase in self-efficacy: the belief that one can cope with the potentially aversive behaviour of the spider. The treatment videos were predicted to enhance the participant's self-efficacy regarding their own reactions to the encounter. They were not specifically predicted to change the participant's beliefs about the potential behaviour of spiders. The smaller decrease in spider-related beliefs for both groups may have been because the spider's actions were viewed as less controllable than one's own. Hence, these beliefs may be less dependent on self-efficacy beliefs.

An analysis of the correlations supports this proposition. In the self-modelling group, all the participants showed relatively strong negative correlations (between -0.59 and -0.97), except one participant, who showed a positive correlation of 0.99; (95% CI: $-1.00 \leq -0.49 \leq 0.13$). In the peer-modelling group, some showed strong negative correlations (four between -0.80 and -0.99), there was more variability in the other r values (between 0.03 and 0.99); (overall, 95% CI: $-1.00 \leq -0.25 \leq 0.59$). When the overall mean correlations and confidence intervals are compared, for the self-modelling group, the spider-related beliefs show less congruence with self-efficacy than self-related beliefs. The data also once again shows that the self-modelling group displayed the strongest and most consistent relationship between self-efficacy enhancement and decreases in spider-related phobic beliefs.

The modelled scenes primarily depicted the models remaining calm and coping effectively in the three different spider encounter situations. The opportunities to show the predictability and controllability of the spider itself were limited by the video technology available. As described in Appendix H, it was initially planned to show the sheet-web spider being 'herded' around in circles by the participant's finger in one of the scenes. This would have demonstrated the high degree of controllability and predictability of spiders, which Bandura (1986) and Öst et al. (1991) have emphasised as key ingredients in successful treatments for phobias. Technical difficulties eventually made this impossible and it was substituted with a brief, less convincing shot of the spider being herded along a table-top by the end of a pen. Further, Öst et al. (1991) assert that "the most important factor in the one-session treatment is making explicit the patient's catastrophic thoughts and devising the exposure situation in such a way that these can be tested out" (Öst et al., 1991, p.421). The treatment medium in this experiment precluded the possibility of doing this for each participant and no commentary containing examples of catastrophic thoughts was overdubbed onto the scenes. Thus, after the conclusion of the treatment phase, the participants may have retained many beliefs about the potential aversive behaviours of spiders.

4.1.3(b) Self-reported spider-phobic symptoms: The FQ

The results also showed that over the course of the experiment both groups reported fewer spider-phobic symptoms on the FQ. There was a larger effect for the self-modelling group than for the peer-modelling group. These results therefore also support Hypothesis 3. When the subscales of the FQ were examined, it appeared that self-modelling only showed a greater effect on the vigilance subscale.

For both groups, the FQ showed reductions in participants' constant scanning and vigilance, preoccupation or distressing recurring thoughts about spiders, and avoidance (which was replaced by more adaptive coping strategies). This finding is in line with social-cognitive theory. Bandura (1997) asserts that in regards to anxiety disorders, efficacy beliefs regulate affect through the individual's beliefs about control over, among other factors, attentional biases, perturbing trains of thought, and actions which can be taken to lessen the aversive potential of the environment (coping). Therefore, the strengthened sense of self-efficacy engendered by vicarious and enactive mastery experiences in the experiment led to positive changes in beliefs in these areas, which was reflected in the lower FQ scores.

An analysis of individual correlations between FQ total score and overall self-efficacy level showed that, in the self modelling group, all except two participants' scores ($r = 0.30$ and $r = -0.47$) were strongly negatively correlated (r values between -0.86 and -0.99); (95% CI: $-1.00 \leq -0.68 \leq -0.24$). In the peer-modelling group, negative correlations ranged between $r = -0.51$ to -0.99, with three participants showing strong positive correlations (r value between 0.77 and 0.99); (95% CI: $-0.99 \leq -0.10 \leq 0.79$). The self-modelling group therefore showed the pattern of strong negative correlations predicted by the theory. The peer-modelling group, however, showed a much more variable relationship between the measures.

4.1.4 Hypothesis 4

The results show that there was little change for either group on the GSES, and little difference between the participants in each pair. These results support Hypothesis 4. The findings are in accord with Bandura's (1997) assertion that therapeutic interventions for phobias raise self-efficacy in coping specifically with the phobic object, and that only measures of this specific type of self-efficacy show improvements closely related to behaviour change after successful interventions. In contrast, he asserts, generalised self-efficacy measures are too vague and do not provide the respondents with enough specific context to measure any changes that relate to behavioural improvements after interventions.

4.1.5 Hypothesis 5

The results showed that there were many strong positive correlations between BAT performance and self-efficacy strength and level. It was noticeable that the largest correlations for both groups were between BAT self-efficacy strength and BAT performance (for the overall BAT self-efficacy strength correlation, $r = 0.78$, $p < 0.001$). This is in line with the previous findings regarding these two measures discussed earlier. It is also in accordance with Bandura's (1997) assertion that self-efficacy is the principal determiner of performance, and that "subsequent behavioural change is highly predictable from level of self-efficacy change" (Bandura, 1997, p.327).

The findings are similar to previous video self-modelling studies where self-efficacy was measured. Bradley (1993) found a correlation between self-efficacy strength and basketball free-throw performance of 0.689. Similarly, Holman (1991) administered video self-modelling to increase swimming performance and found a positive correlation between pre and post self-efficacy strength and swimming speed significant at the $p < 0.005$ level (he did not report the correlation size).

The finding of a strong overall correlation between self-efficacy level and BAT performance (overall, $r = 0.66$, $p < 0.01$) is also in line with these findings. This highlights that the self-efficacy level measure was not quite as reliable a predictor of performance as the BAT self-efficacy strength measure. This is probably due to the nature of the measure. Based on earlier studies (e.g., Öst et al., 1997) the self-efficacy level was calculated from the number of BAT steps that the participant endorsed as feeling 20% or more certain that they could complete. This cut-off point forced a distinction between participants regarded by the measure as feeling completely unable to achieve the step and those regarded as feeling completely able to achieve it, depending on whether they scored above or below 20%. This resulted in a loss of data and precision in the measure. For this reason, the self-efficacy level measure was not as good a predictor of performance as the self-efficacy strength measure.

The results also showed that the correlations of BAT performance with video self-efficacy strength were weaker than with BAT self-efficacy; and further, that the correlations with everyday self-efficacy was weaker still. This may be explained by the differing levels of similarity to the BAT situation:

1. The BAT self-efficacy measure was calculated from beliefs about the exact steps to be performed on the BAT, which had already been experienced by the participants and was also shown in the video to some extent;
2. The video self-efficacy measure asked about performance situations which, although not the same as the steps of the BAT, were depicted on the video as occurring in the same room and, in two scenes, with the same spider as the BAT; and
3. The everyday self-efficacy measure loaded on items dissimilar to the BAT in that they occurred outside a laboratory situation and included different types of spiders and experiences.

Thus, in line with the claims made by social cognitive theory, BAT performance had the highest correlations with measures of the participants' beliefs about their BAT performance capabilities and the lowest correlations with their beliefs about dissimilar situations. This highlights the need for specificity in measures of self-efficacy, and reiterates the finding that gains made in one area after modelling (BAT self-efficacy and performance) did not generalise perfectly to other situations.

The last finding of note relating to hypothesis 5 is that the number of large correlations found (especially for BAT self-efficacy strength) indicates that the participants' self-reports were reliable and reasonably good reflections of their actual level of ability.

4.1.6 Hypothesis 6

4.1.6 (a) Self-reported distress and anxiety: The SUDS.

As can be seen from the results, the self-modelling group, on average, decreased slightly on the SUDS measure by follow-up and the peer-modelling group actually increased slightly. Thus, the first prediction in the hypothesis that both groups would decrease in SUDS was not supported. The second prediction that the self-modelling group would show a greater decrease in SUDS than the peer-modelling group was supported.

It can be seen from the individual results that most of the participants reported less SUDS during the video exposure than during the BAT, and that these levels decreased gradually over consecutive viewings. This is what one might expect: the video scenes depicting spiders were not as anxiety provoking as being close to a live spider. This is in line with previous findings, such as that of Öst et al. (1997). When comparing direct treatment with live and filmed modelling, they stated that "videotape is a much weaker form of exposure and the patients never had to fear that the spider could crawl up on them" (p730).

Some of the participants in the current experiment, however, reported more SUDS during the video viewings than during the baseline BATs. If the SUDS ratings of these participants are compared between baseline and post-treatment or follow-up BATs, all show a moderate to large increase, whereas all the other participants show either no change or a decrease. The small overall decrease in SUDS shown in the self-modelling group, and the slight increase shown by the peer-modelling group, is, in large part, due to the data from these participants.

This finding may be a similar phenomenon to that found by Öst et al (1997) when they compared video to live modelling for spider phobics. They found that participants who had undergone a video peer-modelling condition reported less anxiety after treatment than those who had undergone live peer-modelling (who did not show much increase in SUDS at all). The reason the researchers cited for this was that the participants in the live-modelling condition experienced high levels of anxiety arousal while observing the model, which made it difficult for them to concentrate on the information and learn from it. It appears that the same effect may have occurred in this experiment. Those that failed to habituate to the anxiety-provoking qualities of the intervention videos showed minimal decreases in anxiety after treatment. It may even be that for those susceptible to high anxiety during video modelling, these interventions actively worsen subjective anxiety during live spider exposures through classical conditioning processes.

4.1.6 (b) Physiological indicator of anxiety: Heart-rate (HR)

The results showed that there was little or no change for both groups on the HR measure from assessment 1 to assessment 4. This did not support the hypothesis. However, the individual data showed that many of the participants in both groups varied considerably from one assessment to the next. This suggests that the measure was unreliable.

Each participant was made to wait in the laboratory until their HR had stabilised at a resting level. Then it was taken again at the end of the BAT, and the final HR measure was the difference score of these two readings. This was done to remove differences that may have occurred due to the participants starting the BAT at different levels relative to their resting HR. This only removed one of the possible confounds in the measure however. At least three more were still present:

1. Each person underwent BATs of different lengths. The BATs involved physical exercise and sudden increases in anxiety (usually if the spider made a sudden movement) which had varying lengths of time to dissipate, depending on how long the participant persevered at the task.
2. Each participant had a different fitness level. This would have affected how long their HR took to fall back to its resting level after stimulation.

3. Each participant would have had differing levels of anticipatory anxiety before the beginning of the BAT which may have elevated their HR above resting level.

Thus, these factors would have confounded the measure and produced the high degree of variability both within and between participants.

4.2 Summary and Interpretation of the Results for Pair F.

Mae's results are usually always reasonably close to the peer-modelling group mean whereas Karla's results are extremely different from the normal pattern shown in the self-modelling group. Her results are often in the opposite direction of change from the group mean, or fall more than one standard deviation away from it. This section discusses some examples from Karla's data, and concludes with a possible interpretation for these.

4.2.1 Summary of Karla's results

4.2.1(a) Self-efficacy.

In BAT self-efficacy strength Karla was the only participant to show an overall decrease, her difference score lying 1.68 standard deviations below the mean for the group. Her video self-efficacy showed great fluctuations after each viewing of the video, ranging from six times more than to half as much as her initial score. She was the only participant in the self-modelling group to show a decrease on this measure by follow-up. Her

Everyday self-efficacy was only raised to a small degree, and she was the only member in the group to show a decrease in self-efficacy level.

4.2.1 (b) BAT performance.

Karla progressed only one step on the BAT to reach step 4 (stopping close to the container) by follow-up. She could not touch the container with the live spider inside. It was observed that even reaching this level was a huge struggle for her, and that when she reached the table she could not look at the spider for more than a second. All the self-modelling participants had, at one time or another in the course of the experiment, reached step 7, where they could hold the container close to their faces and observe the spider for some time.

4.2.1 (c) Self-report measures.

Most interesting were the increases in spider-phobic beliefs. On the SBQ spider-related subscale, in contrast to Mae, who showed a large decrease, Karla showed a large increase in phobic beliefs, 2.07 standard deviations away from the mean change for her group. She showed an even larger increase in self-related beliefs, scoring 3.67 standard deviations more than the mean change for her group. The largest increase was shown in her beliefs on the *Multiplication* subscale (the spider will multiply, or more will appear), which increased from 10% to 60%.

4.2.1 (d) Correlations between BAT performance and self-efficacy.

The correlation which one would expect to be the highest is that between BAT self-efficacy strength and BAT performance. However, Karla's data shows a strong negative correlation ($r = -0.67$). This indicates that her self-reporting of self-efficacy was not reliable or reflective of her abilities. She tended to consistently underestimate her abilities.

4.2.1 (e) Subjective measures of anxiety: SUDS

Karla reported SUDS as high as 10 during one of the video viewings. This was after a stable baseline of 7 during the BATs. She then went on to report a SUDS rating of 10 at the follow-up BAT. She was clearly very distressed at times during the treatment, and this distress worsened over the experiment's course.

4.2.2 Interpretation of Karla's results

Added to these aberrant results is the data on the HADS measure, on which her generalised anxiety levels elevated from moderate to serious, increasing by 7 points. All the other participants in the study stayed at the same level or decreased on this measure. Her depression scores, in contrast, did not show any appreciable change. If one considers all these factors, it seems likely that Karla's bipolar disorder was involved in some way in her results. Her avoidance did not improve to a great degree; her self-reported beliefs got significantly worse; her anxiety worsened to reach maximum levels, both in the BAT and generally; and her self-efficacy worsened.

In terms of her anxiety, she showed the same pattern as some of the other participants in that she found the video very distressing, and then the post-treatment BATs more distressing than the baseline BATs. It seems unlikely that her aberrant results are solely expressions of the same phenomena found with the other participants who showed increases in SUDS. This is because the other participants usually showed decreases in other symptoms and avoidance, and increases in self-efficacy. In addition, none of the other participants showed increases in generalised anxiety. It seems more likely that all of the changes seen in Karla's case occurred because of her condition, and the high SUDS at follow-up occurred largely because of her severe generalised anxiety at the time.

In terms of social cognitive theory, Karla was unable to benefit from the modelling intervention because her disorder may have rendered her without the cognitive competencies to sustain attention; transform the information into symbols and images to guide action; be cognitively able to produce the appropriate behaviour; or be motivated enough to carry out the behaviour.

4.3 Implications

This study extended the investigation of video self-modelling into the field of specific phobias. The findings have many implications for the application of video self-modelling interventions in this area.

4.3.1 Advantages of Self-Modelling over Peer-Modelling for the Treatment of Phobias

The findings hold promise for the application of video self-modelling to the treatment of phobias. This study provides preliminary evidence regarding the improvements phobic patients are likely to make and what limitations exist when self-modelling is applied to these disorders.

4.3.1 (a) Self-efficacy.

When videos depict scenes involving models coping with a phobic object, the observer is likely to develop much stronger beliefs that they too can cope in such a situation if they observe themselves as the model rather than if they observe another person. These beliefs are strongly correlated with reductions in avoidance of the phobic object. In addition, self-modelling produces self-efficacy enhancements in people with phobias more consistently than peer-modelling.

These self-efficacy enhancements do not generalise perfectly to other situations, and are weaker when the situations have not been modelled for the observer. Phobic patients are likely to believe that they can cope with more frightening situations after video self-modelling (self-efficacy level) and this effect is more powerful and consistent than that found after peer-modelling.

4.3.1 (b) Avoidance.

After self-modelling, clinically significant reductions in avoidance of the phobic object are more likely than after peer-modelling. For patients with spider phobia, this means that they will be more likely to be able to touch the spider and even be willing to hold it for 20 seconds.

4.3.1 (c) Irrational beliefs.

Video self- modelling reduces phobic patients' irrational beliefs about (a) their lack of coping abilities and control over themselves in an exposure situation, and (b) the potential behaviours of the phobic object, to a greater degree and more consistently than video peer-modelling. The degree of reduction appears to be greater for (a) than (b), but this may have been because of limited focus on (b) in the video scenes.

4.3.2 Further Implications

4.3.2 (a) Teaching the withholding of behaviours

Clark et al. (1992) suggested that self-modelling may be more suited to teaching people to emit behaviours rather than to withhold them. This study showed that phobic participants can be taught to decrease their phobic beliefs, vigilance and preoccupation with spiders. These are behaviours that the participants learned to withhold more successfully after self-modelling. Thus, this evidence goes against the claim made by Clark et al. (1992).

4.3.2 (b) Practical Advantages of self-modelling treatment.

There are several practical advantages self-modelling possesses over traditional psychotherapeutic methods, including:

1. The short treatment time. After the videos were made (filming of the participants took about 30 minutes), the participants all spent less than 1 hour undergoing treatment.
2. The high degree of interest, co-operation and motivation towards treatment in the participants.
3. The fact that the participants were able to watch the video privately for 10 minutes each time in their own homes.
4. The fact that the videos remained consistent in the information given each time, unlike the variation that may occur in normal therapy.
5. The minimal amount of time the clinician needs to invest in treatment once the videos are made.
6. The ease with which further 'booster viewings' can be administered after the conclusion of treatment.

4.3.2 (c) New filming techniques.

This study pioneered a new technique in video self-modelling: the use of blue screen filming to generate some of the scenes. This technique makes it possible for the therapist to place the phobic patient against any background (e.g., on the top of a high cliff looking over for height-phobia), or insert the phobic object into a background which shows the patient (as was used in this study). The use of computer technology to generate or alter images would offer a further extension of this technique.

4.3.3 The Limitations of Self-Modelling Treatments for Phobias

4.3.3 (a) Self-reported anxiety.

After video-modelling, it may be that the level of subjective anxiety experienced during the video observations dictates whether subjective anxiety will increase or decrease upon the patient's subsequent encounters with the phobic object. Lowered anxiety during video exposures appears to lead to lower anxiety upon subsequent live exposures, whereas heightened anxiety during the viewing of the video has the opposite effect. It may be that high anxiety during video exposures merely prevents the patient learning from the modelled behaviours (although this seems unlikely as they still make gains in other areas). Alternatively, both self and peer modelling, may have the potential to condition states of high or low anxiety arousal that continue into live exposure situations, depending on the reaction of the patient to the video. For this reason, caution when administering self-modelling interventions for phobias may be advisable. Further research is needed in the future to confirm whether this effect recurs with a larger sample of participants. If the effect had been anticipated by the experimenter, the study could have been improved by including education in progressive muscle relaxation and then allowing participants to stop the videotape at any time until their SUDS had reached low levels again.

4.3.3 (b) Mental health problems

Patients with bipolar disorder, and possibly other severe or acute mental disorders, are unlikely to benefit from self-modelling interventions in terms of alleviation from phobic symptoms or enhancements in self-efficacy. Future research should aim to determine which disorders or disturbed mental processes contraindicate video self-modelling.

4.3.3 (c) Time, skills and equipment needed to create the videos

One disadvantage of the technique, which has also been pointed out by Clark et al. (1992) is gaining access to and knowledge of how to use the technical equipment required for filming and editing the videos. If one intends to use blue screen filming then the two halves of the scene (i.e., the spider film and the patient film) need to be filmed from exactly the same position with the same level of zoom. The objects in the room that the spider is to interact with (e.g., walk on) also have to remain in the same position. Ideally, if a clinician wanted to incorporate this intervention into their therapy for phobias, and use blue screen filming, they would need a room set aside solely for filming the scenes.

It takes some time to script and film the scenes. Assuming a clinician had the resources available, the intervention would start to become efficient in regards to time if several different films were made for different phobias. Then it would only take the time required for the patient to act out their scenes and then for editing the tape together. This approach may not be suitable, however, if the phobic patient has specific problem situations that should be the target of therapy, but which are not depicted in the scenes the therapist has already prepared. In this case, specific films targeting these areas would be necessary.

4.3.3 (d) Limited decrease in phobic symptoms

Öst (1996) and Öst et al. (1991) have reported that, whether in group or individual therapy, between 71% and 100% of patients who undergo their one-session treatment for spider phobia reach the high standard they required as representing clinical improvement. This includes lying 2 standard deviations in the direction of functionality away from the patient group's pre-treatment average on the clinician rating scale, and on the subjective rating of anxiety scale, as well as achieving the final step in the BAT (holding a spider on the hand for 20 seconds). Treatment time lasts 2 to 3 hours.

The results after self-modelling in this experiment do not show the effectiveness of Öst's one-session treatment. The percentages of participants that met the requirement of lying 2 standard deviations in the direction of functionality away from the self-modelling group's pre-treatment average were, by each measure:

1. SUDS: 14%
2. SBQ spider-related: 14%
3. SBQ self-related: 57%
4. FQ total: 29%
5. BAT Self-Efficacy Strength: 57%

In terms of BAT results, as described above, three members of the self-modelling group reached the point where they could touch the spider and one of these participants wanted to go on and hold it but the experimenter had to stop the BAT.

Although these results are not as impressive as those of Öst’s, they are impressive given the nature of the intervention. The experimenter was not a qualified clinician and treatment time, after the filming of the videos, was less than an hour spread over only 2 weeks. Dowrick (1999) noted a comment made by Blum et al (1998) about the effects of self-modelling on selective mutism: “it is surprising that an intervention of such brevity should have *any* effect.” (Dowrick, 1999, p.36). The success of Öst’s one session treatment, in contrast, depends heavily on the skills of the therapist. This was shown in Öst et al. (1991) when it was found that nearly all those who completed the same treatment from a manual did not meet the requirements for clinically significant change

4.3.3(e) Inability to integrate important components.

The nature of the video self-modelling intervention is such that it lacks several of the important components present in guided mastery interventions such as Öst’s one-session treatment. Firstly, it is impossible for the patient to test out their catastrophic beliefs about the things a spider is capable of doing in a real-life encounter. They can only see the spider engaging in the limited range of behaviours recorded on the video. The intervention also cannot utilise response induction aids as guided mastery interventions can. These techniques, such as joint performance with the therapist, “create enabling environmental conditions so that incapacitated phobics can perform successfully despite themselves” (Bandura, 1997, p.329).

4.4 Limitations of the Study

4.4.1 Causality

A current debate in the field regards the exact nature of the learning mechanisms that bring about the changes seen after self-modelling. Bandura's (1986; 1997) social cognitive theory claims that self-modelling, along with other forms of therapy, works principally through self-efficacy change.

This study assumes a social cognitive perspective to explain self-modelling, and the predictions made from the theory have almost all been supported by the findings. Self-efficacy was enhanced strongly in the self-modelling group, and these changes were closely related to changes in behaviour. However, this does not provide strong proof that self-efficacy was indeed the causal mediator that produced the changes in behaviour. Self-efficacy changes and behaviour changes may have been mediated by a third variable. Dowrick (1999) takes the position that self-modelling should be considered as a different learning mechanism to that of observational learning. Kehle et al. (2002) have proposed that the learning mechanism at work, at least in the case of children, is the creation of false memories. This study sought to (a) extend the study of self-modelling into the area of phobias, (b) to provide more empirical evidence that self-efficacy is enhanced after self-modelling, and (c) to compare video self-modelling to video peer modelling. Examinations of causal mechanisms were not specifically the aim of this study and should be a focus for future research.

4.4.2 Group Size

There were only eight participants in each group in this experiment, and this was further reduced to seven in terms of the number that could be used for mean group mean calculations because of the aberrant results of one participant due to bipolar disorder. The number was constrained due to the time needed to edit the videotapes, which was about two hours for each tape. This was in addition to the many hours spent constructing and piloting the scenes, filming the spider footage, and then each participant's footage. A task for future research is to more fully investigate the effects of self-modelling on a larger group of phobic participants.

4.4.3 Short Follow-Up Period

Time constraints meant that the study did not continue for a long-term period. It was found that after self-modelling, participants continued to show further improvements 6 weeks after treatment. Future research should investigate how much longer after treatment these advances occur, by including a longer-term follow-up period.

4.4.4 Further Improvements That Could Have Been Made

Various other improvements could have been made to improve the results shown by participants in this study. In some cases however, these added components may have confounded the results. The selection criteria for recruitment into the study could have included a requirement that all participants not have a diagnosis of a mental disorder. This would have prevented Karla from being included and would have increased the sample size for group mean calculations. This would have meant, however, that important findings regarding the ineffectiveness of self-modelling with severely disordered patients would never have occurred.

Better equipment would have made better blue screen scenes possible, for example a lengthy scene depicting the ‘chasing’ of a spider with the participant’s finger to emphasise the controllability and predictability of spiders. In addition, a computer editing suite would have produced a ‘cleaner’ overall image to increase the credibility of the scenes and the viewer’s attention.

Retention may have been enhanced by lengthening the treatment phase and including more video exposures. Asking the participants to visualise themselves in the situations using mental rehearsal may also have improved results but it would have introduced a further therapeutic process into the study, which would have confounded the test of the effectiveness of self modelling.

In line with the comments by Öst et al. (1991) that it is important to test out patient’s catastrophic cognitions, this study could have included a preliminary survey of the participant’s worst fears about what could happen during encounters with a spider. These could then have been used to aid the development of the scenes to show that these ‘worst case scenarios’ would not occur. The videos could then have included a commentary by each self-modelling participant describing their worst fears about what might happen during the scenes as they unfolded. They would then observe that the outcomes they expected did not happen in the scenes. Applications of self-modelling to phobias in the future would probably be more effective if they included this component.

Lastly, although the assumption was made in this study that all the participants would be motivated to alleviate their phobic symptoms to enhance their quality of life, the addition of sizeable performance-based external reinforcers could possibly have increased the motivation of each participant to succeed. In this study this component could not be added because it would have added a confounding influence on the results.

4.5 Conclusion

This study investigated the application of a video self-modelling intervention to a new area. Specific phobias are a problem which patients commonly present with in clinical practice. Spider phobia was chosen as a model phobia to investigate the effects of the modelling technique. Theory and past research indicated that video self-modelling would produce superior results in this area compared with traditional video peer-modelling. This proved to be the case. Self-modelling participants were shown to improve more on measures of self-efficacy, avoidance, anxiety, and self-reported symptoms and beliefs.

Although further research is required to investigate the possibilities and limitations of this technique, this preliminary study indicates that, once a clinician acquires the resources and skills to administer the technique, self-modelling interventions could be a useful adjunct to normal exposure therapy for phobias in clinical practice.

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Appendix A

Fear of Spiders Questionnaire (Watts & Sharrock, 1984)

This questionnaire requires you to answer 43 questions about spiders. The aim is to find out how much you know about spiders and how you deal with them in your daily life. Please choose either YES or NO in response to each question, and delete the other option. For example:

1) Do you check the lounge for spiders before sitting down?

Please choose one:

NO

Now please fill in the questionnaire:

1) Do you check the lounge for spiders before sitting down?

YES NO

2) Can you deal effectively with spiders yourself when you find them?

YES NO

3) Are spiders insects?

YES NO

4) Do you sometimes dream about spiders?

YES NO

5) Do you ever make plans incase you come across a spider?

YES NO

6) Do you sometimes look at the corners of the room for spiders?

YES NO

7) Do you get other people to get rid of them when you find them?

YES NO

8) When imagining a spider, is it always the same one or kind?

YES NO

9) Do you think a lot about spiders?

YES NO

10) Would you know how to cope with spiders in the bath?

YES NO

11) When watching television, would you notice a spider crawling across the floor elsewhere in the room?

YES NO

12) Do spiders have six legs?

YES NO

13) Do you sometimes use a book or newspaper to deal with a spider?

YES NO

14) Do you worry more about spiders than most people?

YES NO

15) Do you feel a lot more secure if someone else is in the house, in case you came across a spider?

YES NO

16) When you imagine a spider, can you see parts of it in great detail?

YES NO

17) Do you check the bedroom for spiders before going to sleep?

YES NO

18) When you find a spider in a room, would you avoid going in that room until someone else had removed it?

YES NO

19) Do you ever find yourself thinking about spiders for no reason?

YES NO

20) Are spiders solely meat eaters?

YES NO

21) Would you get help if you came across a spider?

YES NO

22) Do you ever lie in bed at night and listen out for spiders?

YES NO

23) If you *thought* you saw a spider would you go for a close look?

YES NO

24) Do you sometimes find it an effort to keep thoughts of spiders out of your mind?

YES NO

25) Would your mind be a lot easier if spiders didn't exist?

YES NO

26) Have you a good idea whereabouts spiders are likely to appear?

YES NO

27) Are you always on the lookout for spiders?

YES NO

28) Do you often think about particular parts of spiders, for example the fangs?

YES NO

29) If you find a spider in the bath, would you, say, use a shower to wash the spider down the plughole?

YES NO

30) Are you sometimes distracted by thoughts of spiders?

YES NO

31) Have you a ‘plan for action' in case you find a spider in the kitchen?

YES NO

32) Are you sometime haunted by thoughts of spiders?

YES NO

33) Do you make very certain there are no spiders around before taking a bath?

YES NO

34) If you discover a spider in a room, do you leave the room straight away?

YES NO

35) When watching television do you think more about the danger of there being a spider in the room than about the programme?

YES NO

36) When you see a spider, does it take a long time to get it out of your mind?

YES NO

37) Do you know when (what time of year) you are likely to come across a spider?

YES NO

38) Do you sometimes sense the presence of a spider without actually seeing it?

YES NO

39) Are you slightly scared to enter a room, say a bathroom, where spiders have been in the past?

YES NO

40) If there's a spider in the house, are you the most likely person to find it?

YES NO

41) Have you had nightmares about spiders?

YES NO

42) Would you think about using a broom to deal with a spider in the kitchen?

YES NO

43) Can you spot a spider out of the comer of your eye?

YES NO

Appendix B

The Spider Phobia Beliefs Questionnaire (Arntz, Lavy, Van Den Berg, Van Risjoort, 1993)

This questionnaire asks you to remember the times when you have been confronted by a spider and to answer two questions for each item. In the questionnaire there are 78 thoughts that some people have reported having during confrontations with spiders. You will be asked to rate how much you believed this thought ***during the moments*** *when you were confronted by a spider.* A rating of 0 % would mean that you have never believed this thought when confronted by a spider.

Thought 1: "When there is a spider in my vicinity, I believe that the spider will come towards me."

Can you please rate out of 100 how much you believed the thought **during the moments** when you have been confronted by a spider:

e.g. ___80__ %

Now please fill out the questionnaire.

For the items on this page please rate out of 100 how much you believed the thought **during the moments** when you were confronted by a spider.

When there is a spider in my vicinity….

1) I believe that the spider will come towards me.

________%

2) I believe that the spider will jump onto me.

________%

3) I believe that the spider will crawl into my clothes.

________%

4) I believe that the spider will bite me.

________%

5) I believe that the spider will attack me.

________%

6) I believe that the spider will crawl towards my private parts.

________%

7) I believe that the spider senses that I am anxious.

________%

8) I believe that the spider knows that I am anxious and that I cannot stand it.

________%

9) I believe that the spider does things on purpose to tease me.

________%

For the items on this page please rate out of 100 how much you believed the thought **during the moments** when you were confronted by a spider.

When there is a spider in my vicinity….

10) I believe that the spider is mean.

________%

11) I believe that the spider is poisonous.

________%

12) I believe that the spider is deadly.

________%

13) I believe that the spider is dangerous.

________%

14) I believe that the spider is horrible.

________%

15) I believe that the spider is dirty.

________%

16) I believe that the spider is unpredictable.

________%

17) I believe that the spider is vicious.

________%

18) I believe that the spider is incalculable.

________%

19) I believe that the spider is very quick.

________%

For the items on this page please rate out of 100 how much you believed the thought **during the moments** when you were confronted by a spider.

When there is a spider in my vicinity….

20) I believe that the spider is uncontrollable.

________%

21) I believe that the spider runs in an elusive way.

________%

22) I believe that the spider usually travels in pairs.

________%

23) I believe that the spider will become larger.

________%

24) I believe that the spider hides itself.

________%

25) I believe that the spider runs very fast

________%

26) I believe that the spider will chase me.

________%

27) I believe that the spider is staring at me.

________%

28) I believe that the spider will settle in spots I do not want, like my bed.

________%

29) I believe that the spider will pop up unexpectedly.

________%

For the items on this page please rate out of 100 how much you believed the thought **during the moments** when you were confronted by a spider.

When there is a spider in my vicinity….

30) I believe that the spider will control me.

________%

31) I believe that the spider walks all over me during the night.

________%

32) I believe that the spider will hide itself and pop up unexpectedly 10 times as big, or with other spiders.

________%

33) I believe that the spider will drive me to the wall.

________%

34) I believe that the spider cannot be shaken off once it is on me.

________%

35) I believe that the spider especially picks me because of my fear.

________%

36) I believe that the spider hides itself in order to pop up unexpectedly.

________%

37) I believe that the spider wants to come upon me on parts that I cannot reach.

________%

38) I believe that the spider becomes (in my imagination) very large and holds me with its legs.

________%

For the items on this page please rate out of 100 how much you believed the thought **during the moments** when you were confronted by a spider.

When there is a spider in my vicinity….

39) I believe that the spider will settle on my face.

________%

40) I believe that the spider is never alone, there are always more of them.

________%

41) I believe that the spider will drop from the ceiling on me.

________%

42) I believe that the spider is spying on me.

________%

If the spider does not go away and crawls on me…

43) I will become crazy because of anxiety.

________%

44) I will not be able to stand it.

________%

45) I will panic completely and not know what I'm doing.

________%

46) I will die of fear.

________%

47) I will lose control over myself.

________%

For the items on this page please rate out of 100 how much you believed the thought **during the moments** when you were confronted by a spider.

If the spider does not go away and crawls on me…

48) I will have to be transported to a hospital or psychiatric ward.

________%

49) I will become so anxious that other people will think I'm an idiot.

________%

50) I will endanger myself and/or others.

________%

51) I will lash out fiercely.

________%

52) I will become sick with anxiety.

________%

53) I will jump out of a window or out of a moving car.

________%

54) I will get a heart attack.

________%

55) I will scream or yell uncontrollably.

________%

56) I will get creepy dreams.

________%

57) I will think of myself as hysterical or an idiot.

________%

For the items on this page please rate out of 100 how much you believed the thought **during the moments** when you were confronted by a spider.

If the spider does not go away and crawls on me…

58) I will become even more afraid of spiders.

________%

59) I will faint.

________%

60) I will come to see spiders everywhere.

________%

61) I will cause an accident.

________%

62) I will damage my heart.

________%

63) I will vomit.

________%

64) I will be unable to function normally anymore.

________%

65) I will beat up someone.

________%

66) I will dare nothing anymore and be overwhelmed with fear.

________%

For the items on this page please rate out of 100 how much you believed the thought **during the moments** when you were confronted by a spider.

If the spider does not go away and crawls on me…

67) I will cry uncontrollably.

________%

68) I will become paralysed.

________%

69) I will be unable to sleep for days.

________%

70) I will become aggressive (beat, kick, throw).

________%

71) I will become hysterical.

________%

72) I will stiffen completely from anxiety.

________%

73) I will be unable to get the animal out of my mind.

________%

74) I will want to be dead.

________%

75) I will run away blindly.

________%

76) I will be unable to think rationally.

________%

For the items on this page please rate out of 100 how much you believed the thought **during the moments** when you were confronted by a spider.

If the spider does not go away and crawls on me…

77) I will get nightmares of creepy spiders.

________%

78) I will be unable to do anything.

________%

Appendix C

Information Sheet and Self-Disclosure Form

INFORMATION SHEET

<u>Title of Research Project:</u>	**Video Self-Modelling versus Video Peer Modelling: The Effects on Symptoms and Self-Efficacy in the Fear of Spiders.**
<u>Principle Researcher:</u>	**Martin Hood** **Phone:**
<u>Supervisors:</u>	**Neville Blampied, M.Sc., FNZPsS** **Senior Lecturer** **Phone:** **Dean Owen, BSc, MSc, Ph.D** **Lecturer** **Phone:**

You are being asked to be in a research project called Video Self-Modelling versus Video Peer Modelling: The Effects on Symptoms and Self-Efficacy in the Fear of Spiders. By being in the project you are helping me, Martin Hood, with my thesis which is being carried out under the supervision of Neville Blampied and Dean Owen at the University of Canterbury.

The aim of the project is to look at whether people's fear of spiders changes after seeing either themselves or another person handling spiders effectively on videotape. This technique has met much success in dealing with various behavioural problems and psychological disorders. It has not been applied to phobias before however.

In the course of the project you will be asked to carry out various tasks. Before you can be invited to take part you need to first answer the enclosed selection of four questionnaires regarding your fears about spiders, the thoughts you have when encountering spiders, your general level of happiness or worry, and how you handle problems in your daily life.

Along with these could you also please fill in the self-disclosure form giving your details and explaining how your fear of spiders has affected you in your life.

After you have answered the questionnaires and self-disclosure form included in this pack please return them in the envelope provided, along with the signed consent form to say that you have understood what is involved in the project and that you are willing to participate. You can either post it or drop it into the secretaries on Level 2 of the Psychology Building at the University.

If you are invited to participate in the project:

You will need to come into the university on four occasions during the project. Each time you will be asked to wait for ten minutes in a waiting room. This is to make sure that your heart-rate is at its resting level. Your heart rate will be measured and then you will be asked to attempt a "behavioural approach test" or BAT. In the test you will be asked to try and enter a room where a spider sits inside a container. You have to try to move as close to the container as you can. The spider cannot get out and you are not required to touch it (or even enter the room) if you do not want to. We will stop the test at the point where you feel you cannot move any closer. We will need to ask you some questions before and after the test and take a measure of your heart-rate. The total time needed for the BAT (including the waiting period) will be a maximum of only about 20 minutes.

We understand that the BAT may cause you some distress. Although it is important you try your best, we will encourage you to stop the test immediately if it is getting too uncomfortable or distressing.

After the first BAT is finished, you may be asked to act out some simple scenes from which your own personal videotape will be constructed. Although the final scenes will show you interacting with spiders, **no spiders will be present while you act out the scenes.** The final images on the tape will be produced using video editing procedures to make it appear as if you interacted with the spiders. The filming of the scenes will take a maximum of 30 minutes.

The video content will differ for different people taking part in the project. Some will watch themselves interacting with spiders, and some will watch videos of other people interacting with spiders. Certain people, chosen randomly, will be asked to take part in filming of these "spider scenes". If we require you to take part in filming you will be informed upon invitation into the project. If this is the case, you will be asked to give your consent for allowing us to film you, and also to allowing one other person with a fear of spiders to watch your videotape. After the conclusion of the research you may choose to have the tapes destroyed or stored securely in the psychology department to be used in further research. We will send you this consent form in the mail if you have been randomly chosen.

Later, you will be asked to come in for your second BAT. This will again take you 20 minutes and will be exactly the same as the first. At the end of the visit you will be given a videotape. You will be asked to watch the videotape on alternate days over the next two weeks, each time writing down a small amount of information. The total time needed each time you watch the tape will be about 5 minutes.

The videotape will show scenes of spiders interacting with either you or another person taking part in the experiment. We understand that this may cause you distress and that you may need to stop the tape if it gets too stressful to watch. If you are unable to watch the videotape you can call my two supervisors or I at any time to discuss it.

After watching the videotape for two weeks you will then be asked to come back into the university for your third BAT. You will also be asked to fill out questionnaires again. After a period of one month you will come in for a follow-up BAT, again filling out the questionnaires.

To make sure that your name and the information you give is kept private, the questionnaires you fill in and your BAT results will be given a number. Your name will appear next to this number only on one master sheet. This master sheet and all the records of your information will be kept under lock and key. The master sheet will be destroyed at the conclusion of the experiment.

The results of this project may be published but the information you give will be kept completely private throughout the project. Any printed information will be anonymous and provide no identifying information about you. If you appear on videotape, your tape will only be seen by myself, my two supervisors and one other participant in the research. You then decide what happens to the tape at the conclusion of the research.

You will be paid $35 at the end of the project to compensate you for your travel and any other expenses.

You have the right to pull out of the project at any time, you can also ask for all the information you have provided to be given back to you at that time.

It is possible that some of the activities involved in this project may cause distress. If, at any time throughout the research, any part of the experiment causes you distress, please feel free to contact either myself, Martin Hood (366 7001 ext. 7990) or my supervisors Neville Blampied (366 7001 ext. 6199) or Dean Owen (366 7001 ext. 6166). If we are unavailable, you can leave a message and we will get back to you promptly. You may also wish to seek counselling. If you are currently enrolled at the University of Canterbury then you can contact the Student Health Counselling Service 24 hours a day on 364 2402. Otherwise please contact your GP.

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee.

SELF DISCLOSURE FORM

Please answer the questions below. This information is only to give the researcher a more detailed idea of who you are and how your fear affects you. The information will be kept completely confidential.

1) Please write your name in BLOCK CAPITALS.

____

2) Please choose one (ie. delete the alternative):

Male
Female

3) Please state your age:

____

4) Please choose the ethnic group you identify with:

NZ European	Niuean	Indian
NZ Maori	Tokelauan	Samoan
European	Fijian	Tongan
Cook Island Maori	Other Pacific Island	Other
Chinese	Other Asian	

5) Are you currently employed or studying? If so, please state what you work as or what you are studying.

____

____

6) Please choose the highest academic qualification you have achieved.

None
School Certificate
University Entrance
Bursary
University Graduate
Technical Institute/Polytech Graduate
Postgraduate Qualification

7) If you can remember, what age did your fear of spiders first start? (Please choose one).

Before 4 years old
Between 4 and 11
Between 12 and 18
After 18
Can't remember

8) Do you have access to a video recorder/player ? (Please choose one):

YES
NO

9) Have you ever had any disease of the heart or lungs? (Please choose one):

YES
NO

10) In this section I would like you to write a brief summary of your experience of fear of spiders and how it affects you in your daily life (if at all).

What was your first memory of being afraid of spiders?

____

Please describe your most scary experience with spiders (if different from above):

How does your fear affect you in everyday life? Do you avoid doing social, vocational or recreational activities for example?

Do you have certain thoughts or images that repeat in your mind about spiders? If yes, please describe them.

Appendix D

Hospital Anxiety And Depression Scale (Snaith, R.P. And Zigmund, A.S., 1983)

The questionnaire is designed to help your clinician to know how you feel. Read each item below and choose the one which comes closest to how you have been feeling in the past week, writing the number underneath. Don't take too long over your replies, your immediate reaction to each item will probably be more accurate than a long, thought-out response. For example:

1) I feel tense or 'wound up'

3 Most of the time
2 A lot of the time
1 From time to time, occasionally
0 Not at all

Answer: 2

Now please fill out the questionnaire

1) I feel tense or 'wound up'

3 Most of the time
2 A lot of the time
1 From time to time, occasionally
0 Not at all

2) I still enjoy the things I used to enjoy

0 Definitely as much
1 Not quite so much
2 Only a little
3 Hardly at all

3) I get a sort of frightened feeling as if something awful is about to happen

3 Very definitely and quite badly
2 Yes, but not too badly
1 A little, but it doesn't worry me
0 Not at all

4) I can laugh and see the funny side of things

0 As much as I always did
1 Not quite so much now
2 Definitely not so much now
3 Not at all

5) Worrying thoughts go through my mind

3 A great deal of the time
2 A lot of the time
1 Not too often
0 Very little

6) I feel cheerful

3 Never
2 Not often
1 Sometimes
0 Most of the time

7) I can sit at ease and feel relaxed

0 Definitely
1 Usually
2 Not often
3 Not at all

8) I feel as if I am slowed down

3 Nearly all the time
2 Very often
1 Sometimes
0 Not at all

9) I get a sort of frightened feeling like ‘butterflies’ in the stomach

0 Not at all
1 Occasionally
2 Quite often
3 Very often

10) I have lost interest in my appearance

3 Definitely
2 I don't take as much care as I should
1 I may not take quite as much care
0 I take just as much care as ever

11) I feel restless as if I have to be on the move

3 Very much indeed
2 Quite a lot
1 Not very much
0 Not at all

12) I look forward with enjoyment to things

0 As much as I ever did
1 Rather less than I used to
2 Definitely less than I used to
3 Hardly at all

13) I get sudden feelings of panic

3 Very often indeed
2 Quite often
1 Not very often
0 Not at all

14) I can enjoy a good book or radio and television programme

0 Often
1 Sometimes
2 Not often
3 Very seldom

Appendix E

The Generalised Self-Efficacy Scale (Jerusalem & Schwartzer, 1992)

This questionnaire requires you to think about how you react when problems arise in your daily life. You will read ten statements about how you handle problems in your life. Please think carefully about how true the statement is in describing you. Then choose the number that best fits how true the statement is for you, writing the number underneath. For example:

1) I can always manage to solve difficult problems if I try hard enough.

1	2	3	4
Not at all true	Barely true	Moderately true	Exactly true

Answer: 1

Now please fill out the questionnaire.

Please choose the number that best fits how true the statement is for you.

---

1) I can always manage to solve difficult problems if I try hard enough.

1	2	3	4
Not at all true	Barely true	Moderately true	Exactly true

2) If someone opposes me I can find means and ways to get what I want.

1	2	3	4
Not at all true	Barely true	Moderately true	Exactly true

3) It is easy for me to stick to my aims and accomplish my goals.

1	2	3	4
Not at all true	Barely true	Moderately true	Exactly true

4) I am confident that I could deal efficiently with unexpected events.

1	2	3	4
Not at all true	Barely true	Moderately true	Exactly true

5) Thanks to my resourcefulness, I know how to handle unforeseen situations.

1	2	3	4
Not at all true	Barely true	Moderately true	Exactly true

6) I can solve most problems if I invest the necessary effort.

1	2	3	4
Not at all true	Barely true	Moderately true	Exactly true

7) I can remain calm when facing difficulties because I can rely on my coping abilities.

1	2	3	4
Not at all true	Barely true	Moderately true	Exactly true

8) When I am confronted with a problem, I can usually think of several solutions.

1	2	3	4
Not at all true	Barely true	Moderately true	Exactly true

9) If I am in a bind, I can usually think of something to do.

1	2	3	4
Not at all true	Barely true	Moderately true	Exactly true

10) No matter what comes my way, I'm usually able to handle it.

1	2	3	4
Not at all true	Barely true	Moderately true	Exactly true

Appendix F

Specific Self-Efficacy Inventory

The Specific Self-Efficacy Inventory

(To be filled out after watching the entire video)

Part 1: (i) Video, and (ii) BAT items

This questionnaire asks you to think about the tasks shown in the video and those that are possible when you do the BAT. Please could you rate how certain you are of being able to perform each task by indicating from 0 to 100, where 0 = completely certain that you **cannot** perform the task, and 100 = completely certain that you **can** perform the task.

Task	**Certainty (0-100)**
The Video Scenes	
Watch somebody else remove a 3 cm spider from the wall with a cup and paper.	
Remove the same spider from the wall yourself using the cup and paper.	
Sit and watch as a tarantula (about 13 cm) walks towards you across a table, stopping 1 foot away from you.	
Put your face close up (6 inches away) to the tarantula while it sits on the table.	
The BAT	
Stop 4m from container.	
Stop 3m from container.	

Stop 2m from container.	
Stop 1m from container.	
Stop close to the table with the container.	
Touch the container.	
Lift the container and hold it using both hands.	
Hold the container close to face and observe the details of the spider.	
Loosen the lid so that it is nearly off.	
Remove the lid completely.	
Let the spider out of the container.	
Catch the spider using the container and cardboard and replace the lid.	
Touch the spider with a finger.	
Handle the spider out of the container using both hands and replace in the container.	

Part 2: Everyday Situations With Spiders

This part of the questionnaire asks you to rate how effectively you could cope with spiders if you were to encounter them in your everyday life. Some of these require you to think about how you would react if you *had* to put yourself in these situations. Please try and imagine what it would be like even if you are very unlikely to ever encounter such a situation.

Please circle a number on the scale from 1 to 7.

1) **If I was lying in bed and suddenly saw a 1 cm house-spider on the wall in my bedroom, I would…**

1 2 3 4 5 6 7

Panic and not be able to cope at all.

Remain calm and cope effectively with the situation (e.g. remove the spider myself).

2) **If I was lying in bed and suddenly saw a 3 cm house-spider on the wall in my bedroom, I would…**

1	2	3	4	5	6	7
Panic and not be able to cope at all.						Remain calm and cope effectively with the situation (e.g. remove the spider myself).

3) **If I had to visit a live spider exhibit at the zoo, I would…**

1	2	3	4	5	6	7
Panic and not be able to cope at all.						Remain calm and cope effectively with the situation (e.g. observe the spiders calmly).

4) **If I had to visit a household which had pet spiders and the owners handled them in front of me, I would…**

1	2	3	4	5	6	7
Panic and not be able to cope at all.						Remain calm and cope effectively with the situation (e.g. observe the spiders calmly).

5) **If I had to watch a documentary about the habits of spiders, I would…**

1	2	3	4	5	6	7
Panic and not be able to cope at all.						Remain calm and cope effectively with the situation (e.g. observe the spiders calmly).

6) **If I had to handle a 1 cm spider, I would…**

1	2	3	4	5	6	7

Panic and not be able to cope at all.

Remain calm and cope effectively with the situation (e.g. handle the spider calmly).

Appendix G

Treatment Phase SUDS Response Form

Date:_________ **Response Form**

Part 1: Subjective Distress (SUDS)

(To be filled out during the 10 second breaks between scenes on the video)

Please indicate on a scale from 0 to 100 (where 0 = not anxious and 100 = extremely anxious) how anxious you felt watching the video during:

1) Scene 1 (The BAT): _________________

2) Scene 2 (Spider on the wall): _________________

3) Scene 1 (The tarantula): _________________

Appendix H

Producing the Treatment Videos

Two techniques were used to create these scenes. The first, and simplest, (technique 1) involved the participant interacting with a plastic spider. These scenes were shot with a wider perspective, so that the details of the spider could not be distinguished. They were interspersed with close-up shots of the live spider in the same positions. The scenes were edited together to create the appearance of the person interacting with the live spider. This method was used solely with the sheet-web spider, as it proved too small for the second technique.

Creating a realistic effect using blue screen filming (technique 2)[1], was a lengthy process. Different lighting and colours were used until the right combination was found. The room needed to be very brightly lit to remove the shadow under the test spider (a larger tarantula replica). The scenes then took a good deal of re-scripting until they appeared convincing. The scenes were piloted twice before the pilot for the whole experiment was conducted.

[1] Blue screen filming is a complicated technique often utilised in movie production. This involves filming one scene against a blue background and one scene normally. The two are then superimposed and the blue colour removed. Thus, the effect is that the two images appear as one, if the objects and actors in the scenes are lined up correctly.

Using this technique, the tarantula was filmed moving against a blue background. The participants were filmed normally and the two were superimposed so that the tarantula appeared to be in the room with the person. The thicker body and legs made this possible because they did not ‘disappear’ when the blue colour was removed from the picture. Smaller spiders appeared only as a blob or disappeared completely.

Scene 1: The BAT.

The first scene showed the participants completing most of the steps of the BAT successfully. Thus they were shown opening the door to the spider room, walking slowly up to the container, lifting it to their face to observe the details of the spider, then taking off the lid, letting the spider run around, shepherding it with the container and then recapturing it, replacing the container and stepping away. All of these scenes were constructed using technique 1.

Scene 2: Taking a spider off the wall.

In this scene the experimenter demonstrated removing the sheet-web spider from the wall with a cup and piece of paper, and then the participant carried out the same procedure. This was included in the film to show the participant adaptive behaviour that might be useful during an encounter with a spider in their home.

In this scene the experimenter explained the procedure, put the spider on the wall and then removed it by putting the cup over it and the paper behind it and lifting it off the wall. He then asked the participant to complete the task. They did so, although not without trepidation, in accordance with the aim of showing coping, rather than mastery modelling.

Some acting was required from the participants here because the scene involved them interacting with a plastic spider, or no spider at all. Technique 1 was used, editing in shots of the real sheet-web spider.

Scene 3: Tarantula Walks Across the Desk.

This scene showed an arachnologist handling a pink-toed tarantula and providing some commentary on its origin and behaviour. Then he put it down on one side of a 3m desk. The spider crawled slowly towards the other side, where the participant was sitting. It then stopped about 30 cm away from them and the participant leant down, putting their head on their hands to get a closer look, ending up with their face about 12 cm away from the spider. Apart from the initial introduction with the arachnologist, this scene was constructed using technique 2.

Abandoned scenes.

Many other scenes were also attempted, but abandoned for one reason or another. One scene was to show the smaller spider being shepherded about the desk by the participant's finger. This seemed ideal for the purposes of demonstrating the predictability and controllability of the spider, which has been shown by Bandura et al. (1997) to be important for increasing self-efficacy. This was filmed using a blue pointer to make the spider move in different directions. Unfortunately, given the equipment available, the shape and details of the spider were lost in the superimposition onto a normal background. This was because the spider was too small and the legs too thin. We also tried blue screen filming to produce a tarantula crawling on the arm and on the face of the participants. These scenes looked quite convincing but were both abandoned due to the possibility they may be so incredible as to take away from the effectiveness of the treatment. Another consideration was that they may have been too anxiety provoking to watch for the participants.

Appendix I

Self-Efficacy Graphs

Table I1

BAT Self-Efficacy

Participant	Assessment 1	Assessment 2	Assessment 3	Assessment 4	Overall Change	Change (Self - Peer)
A) Naomi (s)	43.57	60.00	75.71	85.00	41.43	
A) Mary (p)	85.79	69.50	82.79	73.71	-12.07	53.50
B) Rachael (s)	28.21	51.07	61.79	74.29	46.07	
B) Justine (p)	49.29	34.64	65.00	68.57	19.29	26.79
C) Jenny (s)	40.00	25.71	44.29	40.00	0.00	
C) Faith (p)	48.93	52.50	64.00	67.14	18.21	-18.21
D) Melanie (s)	63.93	70.36	77.50	81.07	17.14	
D) Elaine (p)	50.71	46.07	69.64	65.35	14.64	2.50
E) Kevin (s)	65.71	78.57	84.29	87.14	21.43	
E) Dana (p)	41.43	30.71	71.43	82.50	41.07	-19.64
G) Sandra (s)	59.29	41.36	61.43	66.79	7.50	
G) Xin (p)	61.43	57.86	72.57	69.29	7.86	-0.36
H) Chris (s)	64.64	80.36	83.93	90.71	26.07	
H) Karen (p)	42.86	62.50	70.36	71.79	28.93	-2.86
Mean - Self (S.D.)	52.19 (14.85)	58.20 (20.19)	69.85 (14.66)	75.00 (17.44)	22.81 (16.77)	Mean Difference
Mean - Peer (S.D.)	54.35 (15.31)	50.54 (14.29)	70.83 (6.17)	71.19 (5.71)	16.85 (16.65)	5.96 (26.02)

F) Karla (s)	22.55	20	15.55	17.14	-5.41	
F) Mae (p)	56.43	66.07	72.85	67.5	11.07	-16.48

Table I2

Video Self-Efficacy

Participant	Assessment 1	Assessment 2	Assessment 3	Assessment 4	Overall Change	Change (Self - Peer)
A) Naomi (s)	27.5	32.5	42.5	82.5	55.00	
A) Mary (p)	66.25	62.25	76.25	77.5	11.25	43.75
B) Rachael (s)	8.75	37.5	52.5	58.75	50.00	
B) Justine (p)	25	25	25	0	-25.00	75.00
C) Jenny (s)	18.75	17.5	38.75	52.5	33.75	
C) Faith (p)	31.25	38.75	36.25	38.75	7.50	26.25
D) Melanie (s)	20	57.5	85	88.75	68.75	
D) Elaine (p)	47.5	50.5	36.25	36.25	-11.25	80.00
E) Kevin (s)	52.5	61.25	93.75	87.5	35.00	
E) Dana (p)	25	58.75	53.75	63.75	38.75	-3.75
G) Sandra (s)	67.5	67.5	68.75	82.5	15.00	
G) Xin (p)	60	55	52.5	65	5.00	10.00
H) Chris (s)	47.5	47.5	51.25	61.25	13.75	
H) Karen (p)	12.5	23.75	15	26.25	13.75	0.00
Mean - Self (S.D.)	34.64 (21.42)	45.89 (17.18)	61.79 (21.25)	73.39 (15.27)	38.75 (20.49)	Mean Difference
Mean - Peer (S.D.)	38.21 (20.02)	44.86 (15.85)	42.14 (20.43)	43.93 (26.75)	5.71 (20.09)	33.04 (34.41)

F) Karla (s)	7.5	7.5	2.5	2.5	-5	
F) Mae (p)	40	26.25	52.5	28.75	-11.25	6.25

Table I3

Everyday Self-Efficacy Changes

Participant	Assessment 1	Assessment 2	Assessment 3	Assessment 4	Overall Change	Change (Self - Peer)
A) Naomi (s)	42.86	42.86	71.43	85.71	42.86	
A) Mary (p)	42.86	54.76	64.29	73.81	30.95	11.90
B) Rachael (s)	69.05	54.76	73.81	85.71	16.67	
B) Justine (p)	69.05	50.00	47.62	50.00	-19.05	35.71
C) Jenny (s)	47.62	40.48	73.81	71.43	23.81	
C) Faith (p)	38.10	35.71	38.10	42.86	4.76	19.05
D) Melanie (s)	40.48	45.24	54.76	66.67	26.19	
D) Elaine (p)	57.14	59.52	54.76	73.81	16.67	9.52
E) Kevin (s)	73.81	78.57	73.81	85.71	11.90	
E) Dana (p)	50.00	47.62	50.00	50.00	0.00	11.90
G) Sandra (s)	69.05	57.14	66.67	59.52	-9.52	
G) Xin (p)	76.19	73.81	76.19	83.33	7.14	-16.67
H) Chris (s)	54.76	61.90	57.14	69.05	14.29	
H) Karen (p)	47.62	42.86	50.00	42.86	-4.76	19.05
Mean - Self (S.D.)	56.80 (13.78)	54.42 (13.29)	67.35 (8.22)	74.83 (10.81)	18.03 (15.96)	Mean Difference
Mean - Peer (S.D.)	54.42 (13.91)	52.04 (12.33)	54.42 (12.40)	59.52 (16.89)	5.10 (15.88)	12.93 (15.72)
F) Karla (s)	26.19	28.57	28.57	28.57	2.38	
F) Mae (p)	57.14	66.66	85.71	64.29	7.15	-4.77

Table I4

Overall Self-Efficacy Changes

Participant	Assessment 1	Assessment 2	Assessment 3	Assessment 4	Overall Change	Change (Self - Peer)
A) Naomi (s)	37.98	45.12	63.21	84.40	46.43	
A) Mary (p)	64.96	62.17	74.44	75.01	10.04	36.38
B) Rachael (s)	35.34	47.78	62.70	72.92	37.58	
B) Justine (p)	47.78	36.55	45.87	39.52	-8.25	45.83
C) Jenny (s)	35.46	27.90	52.28	54.64	19.19	
C) Faith (p)	39.42	42.32	46.12	49.58	10.16	9.03
D) Melanie (s)	41.47	57.70	72.42	78.83	37.36	
D) Elaine (p)	41.90	40.14	47.60	51.28	9.38	27.98
E) Kevin (s)	64.01	72.80	83.95	86.79	22.78	
E) Dana (p)	38.81	45.69	58.39	65.42	26.61	-3.83
G) Sandra (s)	65.28	55.33	65.62	69.60	4.33	
G) Xin (p)	65.87	62.22	67.09	72.54	6.67	-2.34
H) Chris (s)	55.63	63.25	64.11	73.67	18.04	
H) Karen (p)	34.33	43.04	45.12	46.96	12.64	5.40
Mean - Self (S.D.)	47.88 (13.38)	52.84 (14.40)	66.33 (9.77)	74.41 (10.72)	26.53 (14.54)	Mean Difference
Mean - Peer (S.D.)	47.58 (12.83)	47.45 (10.46)	54.95 (11.90)	57.19 (13.73)	9.61 (10.22)	16.92 (19.72)

F) Karla (s)	18.84	18.69	15.59	16.07	-2.77	
F) Mae (p)	51.19	52.99	70.35	53.51	2.32	-5.09

Table I5

Self-Efficacy Level Changes

Participant	Assessment 1	Assessment 2	Assessment 3	Assessment 4	Overall Change	Change (Self - Peer)
A) Naomi (s)	9	12	12	13	4.00	
A) Mary (p)	14	13	14	10	-4.00	8.00
B) Rachael (s)	6	9	9	12	6.00	
B) Justine (p)	12	6	10	10	-2.00	8.00
C) Jenny (s)	6	4	7	6	0.00	
C) Faith (p)	9	9	9	10	1.00	-1.00
D) Melanie (s)	11	12	12	13	2.00	
D) Elaine (p)	9	7	12	10	1.00	1.00
E) Kevin (s)	12	12	12	12	0.00	
E) Dana (p)	6	6	13	14	8.00	-8.00
G) Sandra (s)	10	8	11	12	2.00	
G) Xin (p)	14	13	12	12	-2.00	4.00
H) Chris (s)	14	14	12	14	0.00	
H) Karen (p)	7	10	10	10	3.00	-3.00
Mean - Self (S.D.)	9.71 (2.98)	10.14 (3.39)	10.71 (1.98)	11.71 (2.63)	2.00 (2.31)	Mean Difference
Mean - Peer (S.D.)	10.14 (3.24)	9.14 (3.02)	11.43 (1.81)	10.86 (1.57)	0.71 (3.99)	1.29 (5.88)

F) Karla (s)	5	4	3	3	-2.00	
F) Mae (p)	10	12	12	11	1.00	-3

Appendix J

BAT Scores

Table J1

BAT scores across four assessments

Participant	Assessment 1	Assessment 2	Assessment 3	Assessment 4	Overall Change	Change (Self - Peer)
A) Naomi (s)	9	10	12	13	4	
A) Mary (p)	8	10	10	10	2	2
B) Rachael (s)	4	5	10	10	6	
B) Justine (p)	5	8	9	9	4	2
C) Jenny (s)	4	4	6	7	3	
C) Faith (p)	8	8	9	10	2	1
D) Melanie (s)	9	9	9	10	1	
D) Elaine (p)	5	6	10	10	5	-4
E) Kevin (s)	10	10	13	13	3	
E) Dana (p)	4	8	11	10	6	-3
G) Sandra (s)	5	7	8	6	1	
G) Xin (p)	10	10	12	11	1	0
H) Chris (s)	8	11	13	13	5	
H) Karen (p)	8	8	9	10	2	3
Mean - Self (S.D.)	7.00 (2.58)	8.00 (2.71)	10.14 (2.67)	10.29 (2.93)	3.29 (1.89)	Mean Difference
Mean - Peer (S.D.)	6.86 (2.19)	8.29 (1.38)	10.00 (1.15)	10.00 (0.58)	3.14 (1.86)	0.14 (2.67)

F) Karla (s)	3	2	4	4	1.00	
F) Mae (p)	7	8	9	8	1	0

Appendix K

Self Report Measures

Table K1

SBQ Spider-related Subscale Means

Participant	Assessment 1	Assessment 3	Assessment 4	Overall Change	Change (Self) - Change (Peer)
A) Naomi (s)	60.24	61.67	57.38	-2.86	
A) Mary (p)	44.29	52.62	52.02	7.74	-10.60
B) Rachael (s)	70.24	44.05	42.86	-27.38	
B) Justine (p)	68.21	49.29	62.02	-6.19	-21.19
C) Jenny (s)	59.29	27.62	47.38	-11.90	
C) Faith (p)	61.67	45.71	36.19	-25.48	13.57
D) Melanie (s)	67.74	58.93	37.98	-29.76	
D) Elaine (p)	39.88	36.07	35.36	-4.52	-25.24
E) Kevin (s)	45.36	55.00	54.52	9.16	
E) Dana (p)	60.59	70.83	82.50	21.91	-12.75
G) Sandra (s)	18.09	7.86	7.38	-10.71	
G) Xin (p)	60.59	54.76	52.98	-7.61	-3.10
H) Chris (s)	56.12	63.45	41.90	-14.22	
H) Karen (p)	65.95	39.17	39.76	-26.19	11.97
Mean - self (S.D.)	53.87 (17.74)	45.51 (20.79)	41.34 (16.51)	-12.52 (13.47)	Mean Difference
Mean - peer (S.D.)	57.31 (10.86)	49.78 (11.50)	51.55 (16.87)	-5.76 (17.12)	-6.76 (15.15)

F) Karla (s)	13.93	26.19	29.29	15.40	
F) Mae (p)	44.40	34.40	28.21	-16.20	31.60

Table K2

SBQ Self-related Subscale Means

Participant	Assessment 1	Assessment 3	Assessment 4	Overall Change	Change (Self) - Change (Peer)
A) Naomi (s)	26.39	29.17	9.44	-16.94	
A) Mary (p)	20.00	40.14	25.97	5.97	-22.92
B) Rachael (s)	37.50	10.00	5.83	-31.67	
B) Justine (p)	46.39	43.06	36.11	-10.28	-21.39
C) Jenny (s)	40.00	14.72	6.67	-33.33	
C) Faith (p)	62.92	52.36	47.22	-15.69	-17.64
D) Melanie (s)	15.56	33.47	5.83	-9.72	
D) Elaine (p)	25.83	22.08	18.19	-7.64	-2.08
E) Kevin (s)	29.30	37.08	22.78	-6.52	
E) Dana (p)	13.19	30.28	18.89	5.70	-12.22
G) Sandra (s)	20.56	4.17	7.22	-13.34	
G) Xin (p)	35.00	30.83	24.75	-10.25	-3.09
H) Chris (s)	46.19	44.44	27.64	-18.56	
H) Karen (p)	64.72	22.64	34.31	-30.42	11.86
Mean- self (S.D.)	30.79 (11.00)	24.72 (15.15)	12.20 (9.08)	-18.58 (10.35)	Mean Difference
Mean - peer (S.D.)	38.29 (20.42)	34.48 (11.18)	29.35 (10.46)	-8.94 (12.57)	-9.64 (12.56)
F) Karla (s)	28.06	36.11	47.50	19.44	
F) Mae (p)	25.00	17.78	22.36	-2.64	22.08

Table K3

SBQ Subscales

	Assessment1	Assessment 3	Assessment 4	Overall Change	Change (Self) - Change (Peer)
(Sp)* Harm					
Mean- self (S.D.)	46.93 (23.97)	37.26 (25.38)	32.86 (16.54)	-14.07 (11.53)	Mean Difference
Mean - peer (S.D.)	52.26 (12.32)	44.88 (21.49)	45.18(24.84)	-7.08 (17.37)	-6.99 (19.40)
(Sp) Hunter and Prey					
Mean- self (S.D.)	50.97 (19.10)	40.78(18.39)	35.45 (13.87)	-15.52 (15.12)	Mean Difference
Mean - peer (S.D.)	53.18(15.12)	43.77 (8.51)	43.96 (16.95)	-9.22 (21.78)	-6.30 (17.32)
(Sp) Unpredictability / Speed					
Mean- self (S.D.)	75.00 (14.09)	72.76 (25.66)	68.67 (26.87)	-6.33 (22.43)	Mean Difference
Mean - peer (S.D.)	77.55 (15.38)	81.02 (19.20)	76.73(14.27)	-0.82 (15.21)	-5.51 (21.91)
(Sp) Territory					
Mean- self (S.D.)	60.41 (16.98)	48.16 (18.98)	43.06 (16.97)	-17.35 (16.66)	Mean Difference
Mean - peer (S.D.)	62.65 (18.75)	49.29(11.10)	53.67(22.05)	-8.98 (21.11)	-8.37(15.83)
(Sp) Multiplication					
Mean- self (S.D.)	36.07 (18.91)	37.68 (23.81)	38.21 (27.78)	2.14 (21.72)	Mean Difference
Mean - peer (S.D.)	45.54 (29.81)	34.64 (24.64)	49.11 (27.70)	3.57 (21.91)	-1.43 (36.92)
(Sf)* Panic					
Mean- self (S.D.)	14.32 (17.74)	22.38 (30.61)	12.26 (20.95)	-2.06(15.80)	Mean Difference
Mean - peer (S.D.)	15.32 (13.66)	12.56 (7.80)	7.99 (4.30)	-7.33 (12.07)	5.27 (21.74)
(Sf) Paralyse					
Mean- self (S.D.)	22.30 (13.29)	19.52 (16.57)	8.33 (9.17)	-13.97 (9.01)	Mean Difference
Mean - peer (S.D.)	34.84 (27.53)	27.14 (14.58)	22.46 (13.52)	-12.38 (16.86)	-1.59 (17.18)
(Sf) Incubation					
Mean- self (S.D.)	48.27 (17.41)	39.69 (24.93)	16.73 (12.94)	-31.53 (8.28)	Mean Difference
Mean - peer (S.D.)	58.47 (23.10)	56.12 (18.99)	46.94 (20.87)	-11.53 (16.22)	-20.00 (20.82)
(Sf) Unrestrained Behaviour					
Mean- self (S.D.)	57.32 (21.86)	45.00 (19.84)	25.89 (11.08)	-31.43 (18.52)	Mean Difference
Mean - peer (S.D.)	65.18 (23.70)	61.07 (20.72)	50.00 (16.85)	-15.18 (19.56)	-16.25 (24.08)

Table K4

FQ Total Scores

Participant	Assessment 1	Assessment 3	Assessment 4	Overall Change	Change (Self-Peer)
A) Naomi (s)	19.00	18.00	15.00	-4.00	
%	57.58%	54.55%	45.45%	-12.12%	
A) Mary (p)	19.00	26.00	26.00	7.00	-11.00
%	57.58%	78.79%	78.79%	21.21%	-33.33%
B) Rachael (s)	24.00	23.00	20.00	-4.00	
%	72.73%	69.70%	60.61%	-12.12%	
B) Justine (p)	26.00	21.00	15.00	-11.00	7.00
%	78.79%	63.64%	45.45%	-33.33%	21.21%
C) Jenny (s)	22.00	19.00	14.00	-8.00	
%	66.67%	57.58%	42.42%	-24.24%	
C) Faith (p)	17.00	13.00	12.00	-5.00	-3.00
%	51.52%	39.39%	36.36%	-15.15%	-9.09%
D) Melanie (s)	17.00	12.00	13.00	-4.00	
%	51.52%	36.36%	39.39%	-12.12%	
D) Elaine (p)	15.00	10.00	10.00	-5.00	1.00
%	45.45%	30.30%	30.30%	-15.15%	3.03%
E) Kevin (s)	21.00	20.00	23.00	2.00	
%	63.64%	60.61%	69.70%	6.06%	
E) Dana (p	16.00	11.00	10.00	-6.00	8.00
%	48.48%	33.33%	30.30%	-18.18%	24.24%
G) Sandra (s)	18.00	9.00	10.00	-8.00	
%	54.55%	27.27%	30.30%	-24.24%	
G) Xin (p)	16.00	14.00	18.00	2.00	-10.00
%	48.48%	42.42%	54.55%	6.06%	-30.30%
H) Chris (s)	28.00	22.00	16.00	-12.00	
%	84.85%	66.67%	48.48%	-36.36%	
H) Karen (p)	27.00	28.00	20.00	-7.00	-5.00
%	81.82%	84.85%	60.61%	-21.21%	-15.15%
Mean- self (S.D.)	21.29 (3.82)	17.57 (5.19)	15.86 (4.38)	-5.43 (4.43)	
%	64.50% (11.57%)	53.25% (15.73%)	48.05% (13.26%)	-16.45% (13.42%)	Mean Difference
Mean - peer (S.D.)	19.43 (5.00)	17.57 (7.37)	15.86 (5.90)	-3.57 (6.05)	-1.86 (7.58)
%	58.87% (15.14%)	53.25% (22.33%)	48.05% (17.88%)	-10.82% (18.34%)	-5.63% (22.97%)

F) Karla (s)	24	25	25	1	
%	72.7%	75.8%	75.8%	3.0%	
F) Mae (p)	22	20	18	-4	5
%	66.7%	60.6%	54.5%	-12.1%	15.2%

Table K5

FQ Subscale Mean Scores across Peer and Self Modelling Groups

	Assessment 1	Assessment 3	Assessment 4	Overall Change	Change (Self - Peer)
Vigilance					
Mean - self (S.D.)	8.29 (2.98)	7.00 (3.06)	5.86 (2.91)	-2.43 (2.44)	Mean Difference
%	69.05% (24.87%)	58.33% (25.46%)	48.81% (24.26%)	-20.24% (20.33%)	
Mean - peer (S.D.)	8.00 (2.16)	7.29 (2.29)	6.86 (1.86)	-1.14 (2.48)	-1.35 (3.30)
%	66.67% (18.00%)	60.71% (19.07%)	57.14% (15.54%)	-9.52% (20.65%)	-10.71% (27.52%)
Preoccupation					
Mean - self (S.D.)	5.86 (2.12)	4.57 (1.81)	4.00 (2.31)	-1.86 (2.19)	Mean Difference
%	53.25% (19.23%)	41.56% (16.48%)	36.36% (20.99%)	-16.88% (19.94%)	
Mean - peer (S.D.)	5.29 (2.06)	4.86 (3.02)	3.71 (1.25)	-1.57 (1.62)	-0.32 (3.04)
%	48.05% (18.72%)	44.16% (27.49%)	33.77% (11.40%)	-14.29% (14.71%)	-2.95% (27.63%)
Avoidance / Coping					
Mean - self (S.D.)	7.00 (2.08)	6.00 (1.91)	6.00 (1.83)	-1.00 (2.24)	Mean Difference
%	58.33% (20.82%)	50.00% (19.15%)	50.00% (18.26%)	-8.33% (22.36%)	
Mean - peer (S.D.)	5.71 (1.38)	4.71 (2.63)	4.29 (2.29)	-1.43 (1.13)	0.50 (2.88)
%	47.62% (13.80%)	39.29% (26.28%)	35.71% (22.89%)	-11.90% (11.34%)	3.57% (28.78%)

Table K6

GSES Total Scores

Participant	Assessment 1	Assessment 3	Assessment 4	Overall Change	Change (Self - Peer)
A) Naomi (s)	29.00	28.00	31.00	2.00	
%	72.50%	70.00%	77.50%	5.00%	
A) Mary (p)	26.00	26.00	26.00	0.00	2.00
%	65.00%	65.00%	65.00%	0.00%	5.00%
B) Rachael (s)	34.00	34.00	33.00	-1.00	
%	85.00%	85.00%	82.50%	-2.50%	
B) Justine (p)	27.00	28.00	30.00	3.00	-4.00
%	67.50%	70.00%	75.00%	7.50%	-10.00%
C) Jenny (s)	29.00	34.00	36.00	7.00	
%	72.50%	85.00%	90.00%	17.50%	
C) Faith (p)	18.00	19.00	20.00	2.00	5.00
%	45.00%	47.50%	50.00%	5.00%	12.50%
D) Melanie (s)	35.00	38.00	34.00	-1.00	
%	87.50%	95.00%	85.00%	-2.50%	
D) Elaine (p)	31.00	27.00	31.00	0.00	-1.00
%	77.50%	67.50%	77.50%	0.00%	-2.50%
E) Kevin (s)	31.00	29.00	32.00	1.00	
%	77.50%	72.50%	80.00%	2.50%	
E) Dana (p	38.00	38.00	38.00	0.00	1.00
%	95.00%	95.00%	95.00%	0.00%	2.50%
G) Sandra (s)	31.00	28.00	31.00	0.00	
%	77.50%	70.00%	77.50%	0.00%	
G) Xin (p)	29.00	28.00	30.00	1.00	-1.00
%	72.50%	70.00%	75.00%	2.50%	-2.50%
H) Chris (s)	29.00	30.00	27.00	-2.00	
%	72.50%	75.00%	67.50%	-5.00%	
H) Karen (p)	28.00	32.00	33.00	5.00	-7.00
%	70.00%	80.00%	82.50%	12.50%	-17.50%
Mean- self (S.D.)	31.14 (2.48)	31.57 (3.82)	32.00 (2.83)	0.86 (3.02)	
%	77.86% (6.20%)	78.93% (9.56%)	80.00% (7.07%)	2.14% (7.56%)	Mean Difference
Mean - peer (S.D.)	28.14 (5.98)	28.29 (5.79)	29.71 (5.62)	1.57 (1.90)	-0.71 (3.95)
%	70.36% (14.96%)	70.71% (14.49%)	74.29% (14.05%)	3.93% (4.76%)	-1.79% (9.87%)

Pair 6 - self	33.00	35.00	36.00	3.00	
%	82.50%	87.50%	90.00%	7.50%	
Pair 6 - peer	29.00	30.00	32.00	3.00	0.00%
%	72.50%	75.00%	80.00%	7.50%	0.00%

Appendix L

Subjective and Physiological Measures taken during the BAT

Table L1

SUDS Ratings Across All Four Assessments

Participant	Assessment 1	Assessment 2	Assessment 3	Assessment 4	Overall Change	Change (Self - Peer)
A) Naomi (s)	9	9	9	7	-2	
A) Mary (p)	8.5	8	10	8	-0.5	-1.5
B) Rachael (s)	5.5	5	7.5	7	1.5	
B) Justine (p)	5	8	7	4	-1	2.5
C) Jenny (s)	7	7	9	7	0	
C) Faith (p)	9	6.5	7	9	0	0
D) Melanie (s)	7.5	7.5	7	9	1.5	
D) Elaine (p)	6	6	8	8	2	-0.5
E) Kevin (s)	9	10	8	7	-2	
E) Dana (p)	4	3	10	10	6	-8
G) Sandra (s)	7	7	7	4	-3	
G) Xin (p)	8	8	7.5	8.5	0.5	-3.5
H) Chris (s)	8	8.5	6.5	6	-2	
H) Karen (p)	2	2	8	7	5	-7
Mean- self (S.D.)	7.57 (1.24)	7.71 (1.63)	7.71 (0.99)	6.71 (1.50)	-0.86 (1.84)	Mean Difference
Mean- peer (S.D.)	6.07(2.59)	5.93 (2.49)	8.21 (1.29)	7.79 (1.91)	1.71 (2.77)	-2.57 (3.82)

Pair 6 - self	7	7	8	10	3	
Pair 6 - peer	7	7.5	8	7.5	0.5	2.5

Table L2

Heart-Rate Changes From Resting To Post-BAT.

Participant	Assessment 1	Assessment 2	Assessment 3	Assessment 4	Overall Change	Change (Self - Peer)
A) Naomi (s)	8	18	10	2	-6.00	
A) Mary (p)	8	18	10	2	-6.00	0.00
B) Rachael (s)	37	36	8	13	-24.00	
B) Justine (p)	-3	1	8	19	22.00	-46.00
C) Jenny (s)	12	12	20	21	9.00	
C) Faith (p)	3	6	4	13	10.00	-1.00
D) Melanie (s)	0	24	4	13	13.00	
D) Elaine (p)	0	4	1	1	1.00	12.00
E) Kevin (s)	12	41	21	4	-8.00	
E) Dana (p)	30	21	27	0	-30.00	22.00
G) Sandra (s)	0	26	13	5	5.00	
G) Xin (p)	8	9	4	-7	-15.00	20.00
H) Chris (s)	20	28	-4	18	-2.00	
H) Karen (p)	-16	-16	24	0	16.00	-18.00
Mean - Self (S.D.)	12.71 (12.84)	26.43 (9.93)	10.29 (8.81)	10.86 (7.34)	-1.86 (12.46)	Mean Difference
Mean - Peer (S.D.)	4.29 (13.98)	6.14 (12.19)	11.14 (10.27)	4.00 (8.87)	-0.29 (18.26)	-1.57 (23.99)

F) Karla (s)	5	10	3	10	5	
F) Mae (p)	6	2	7	16	10	-5

Appendix M

HADS scores

Table M1

HADS depression scores across four assessments

Participant	Assessment 1	Assessment 3	Assessment 4
A) Naomi (s)	2	3	1
A) Mary (p)	1	1	1
B) Rachael (s)	4	0	0
B) Justine (p)	2	1	1
C) Jenny (s)	0	0	0
C) Faith (p)	8	8	8
D) Melanie (s)	2	2	2
D) Elaine (p)	6	6	5
E) Kevin (s)	9	7	8
E) Dana (p)	1	2	2
G) Sandra (s)	6	6	4
G) Xin (p)	4	5	6
H) Chris (s)	2	2	1
H) Karen (p)	2	2	2

F) Karla (s)	2	1	1
F) Mae (p)	0	2	1

Table M2

HADS anxiety scores across four assessments

Participant	Assessment 1	Assessment 3	Assessment 4
A) Naomi (s)	15	18	11
A) Mary (p)	1	3	4
B) Rachael (s)	11	5	4
B) Justine (p)	7	7	5
C) Jenny (s)	9	5	5
C) Faith (p)	13	13	12
D) Melanie (s)	7	8	7
D) Elaine (p)	9	10	9
E) Kevin (s)	14	10	13
E) Dana (p)	12	13	12
G) Sandra (s)	4	4	4
G) Xin (p)	7	7	8
H) Chris (s)	9	10	9
H) Karen (p)	9	5	7

F) Karla (s)	12	12	19
F) Mae (p)	5	5	5

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