

# Usefulness of a Trauma-Focused Treatment Approach for Travel Phobia

Ad de Jongh,<sup>1\*</sup> Manda Holmshaw,<sup>2</sup> Wilson Carswell<sup>2</sup>  
and Arjen van Wijk<sup>1</sup>

<sup>1</sup>Academic Centre for Dentistry Amsterdam, Department of Behavioural Sciences, University of Amsterdam, Amsterdam, The Netherlands

<sup>2</sup>Moving Minds Psychological Management and Rehabilitation, London, UK

Despite its prevalence and potential impact on functioning, there are surprisingly little data regarding the treatment responsiveness of travel phobia. The purpose of this non-randomized study was to evaluate the usefulness of a trauma-focused treatment approach for travel phobia, or milder travel anxiety arising as a result of a road traffic accident. Trauma-focused Cognitive Behavioural Therapy (TF-CBT), and Eye Movement Desensitization and Reprocessing were used to treat a sample of 184 patients, who were referred to a psychological rehabilitation provider. Patients in both treatment groups were encouraged to encounter their feared objects and situations between sessions. Specific (i.e., travel) phobia was diagnosed in 57% of cases. Patients in both treatment conditions showed equally large, and clinically significant, decreases in symptoms as indexed by three validated measures (Impact of Event Scale, Hospital Anxiety and Depression Scale, and General Health Questionnaire), therapist ratings of treatment outcome, and a return to driving or travelling by car or motor-bike. These improvements were obtained within an average course of 7.3 sessions of 1 hour each. Patients with travel phobia responded with a greater reduction of anxiety and post-traumatic stress disorder symptoms than those with milder travel anxiety. Passengers reported higher levels of trauma symptoms than drivers, but no difference in effectiveness of treatment was found between these groups. The results suggest that trauma-focused psychological interventions can be a treatment alternative for patients with travel anxiety. Given the seriousness of the clinical problems related to road traffic accidents more rigorous outcome research is warranted and needed. Copyright © 2010 John Wiley & Sons, Ltd.

## Key Practitioner Message:

- As the literature on the treatment of travel phobia is largely limited to small-n studies, this is the largest naturalistic outcome study of the treatment of patients with fear and avoidance of travel, subsequent to a traumatic event, to date.

\*Correspondence to: Ad de Jongh, Department of Behavioral Sciences, Academic Centre for Dentistry Amsterdam, Louwesweg 1, 1066 EA Amsterdam, The Netherlands.  
E-mail: a.de.jongh@acta.nl

- Travel phobia following road traffic accidents should be regarded as a treatable psychological condition requiring a limited number of sessions. In a significant minority of cases the condition is unlikely to remit spontaneously, potentially disrupting occupational, social and personal adjustment.
- Besides a purely exposure, *in vivo*-based approach, a mainly trauma-focused approach, such as imagery exposure or Eye Movement Desensitization and Reprocessing, can be an effective intervention for both travel phobia and milder forms of travel anxiety, and for both drivers and passengers.

**Keywords:** Road Traffic Accidents, Specific Phobia, Travel Phobia, Driving Phobia, Trauma-Focused Cognitive Behavioural Therapy, Eye Movement Desensitization and Reprocessing

## INTRODUCTION

When a person suffers from an excessive or unreasonable persistent fear directed towards a specific travel-related object (e.g., motorbike) or situation (e.g., travelling as a passenger in a car) that is either present or anticipated, it is likely that this person fulfils the criteria for travel phobia<sup>1</sup>, one of the subtypes of specific phobia (American Psychiatric Association, 2000). Travel phobia can manifest as fear and avoidance of private means of transport, as well as public transport, and involve car drivers, passengers, motorcyclists, cyclists, and pedestrians (e.g., Ehring, Ehlers, & Glucksman, 2006; Ehring, Ehlers, & Glucksman, 2008; Mayou, 1997; Mayou & Bryant, 2001, 2002; Mayou, Bryant, & Duthie, 1993; Mayou, Bryant, & Ehlers, 2001).

In many instances travel phobia and travel-related anxiety arise following a road traffic accident (RTA; Taylor & Deane, 1999). In relation to travel anxiety resulting from RTAs, Mayou and Bryant (2001) reported that, despite the minor severity of most peoples' physical injuries, 22% of their sample of 1148 individuals experienced travel anxiety at 3 months post-accident. This appeared to be a persistent condition with 17% still reporting symptoms at 1 year follow-up, and 14% at 3 years follow-up (Mayou & Bryant, 2002).

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<sup>1</sup>Previous research has used a variety of other terms to refer to anxiety regarding driving and other forms of travel, including *driving phobia* or *driving-related fear* (e.g., Ehlers, Hofmann, Herda, & Roth, 1994; Kuch, Swinson, & Kirby, 1985; Mathew, Weinman, Semchuk, & Levin, 1982; Munjack, 1984; Taylor, 2008; Taylor & Deane, 1999; Taylor, Deane, & Podd, 2002; Townend, 2003; Townend & Grant, 2006), and accident phobia (e.g., Kuch, 1997; Kuch, Cox, Evans, & Shulman, 1994; Taylor & Koch, 1995).

Despite the high prevalence rates of travel phobia and anxiety in the general population, its persistency, and the impact of the constellation of symptoms on a person's functioning (e.g., Mayou et al., 1993), there has been remarkably little research regarding its treatment. Although *in vivo* exposure to the phobic stimulus has proven to be the treatment of choice for a variety of specific phobias, empirical evidence on the long-term outcome of *in vivo* exposure as a treatment of specific phobia is less strong than generally assumed (Choy, Fyer, & Lipsitz, 2007). Of the total 14 controlled outcome studies on specific phobia that have been carried out to date, only eight included a control condition. Moreover, these studies addressed only a limited range of phobia subtypes (i.e., animal phobia, water phobia, height phobia, flying phobia, and claustrophobia; Choy et al., 2007). A randomized controlled trial determining the efficacy of *in vivo* exposure for travel phobia has never been performed (Wolitzky-Taylor, Horowitz, Powers, & Telch, 2008). One of the reasons why treatment of travel phobia is not well-studied may be that clinicians feel limited in their ability to accompany patients in a car. For instance, one of the leading providers of professional indemnity insurance for mental health professionals in the UK (Towergate Professional Risks) advise against therapist-assisted exposure during which a patient is confronted with their phobic stimuli, for practical, safety and insurance reasons. They state 'there are other interventions which can be utilised instead of requiring the client to drive so you may wish to consider utilising these in preference' (personal communication, 14 November 2008). Another possible reason why empirical support for *in vivo* exposure in the context of travel phobia is lacking, is that this procedure may lead to an

exacerbation of symptoms. For example, in a study among survivors of the London bombings of 7 July 2005, who subsequently developed a phobia of public transport, it appeared that those who underwent *in vivo* exposure showed an increase in post-traumatic stress disorder (PTSD) symptoms in the course of their treatment (Handley, Salkovskis, & Ehlers, 2008).

There is a number of alternative cognitive behavioural treatment strategies for travel phobia, including cognitive therapy and the use of computer driving games and virtual reality to implement exposure to driving situations. Using cognitive therapy, Townend (2003) reported the successful treatment of travel phobia in two single cases, of which one developed symptoms following an RTA, and the other after an experience of sudden overwhelming anxiety whilst driving. The therapy focussed on the danger and anxiety expectancies of the patients, safety behaviours, and avoidance. Between five and nine sessions appeared to be effective for both patients as indexed by both psychometric scales and a behavioural measure of driving anxiety. In an extension to this treatment report, Townend and Grant (2006) reported successful treatment of eight out of 10 cases with travel phobia using cognitive therapy delivered over 8–10 sessions. Walshe, Lewis, Kim, O'Sullivan, and Wiederhold (2003) reported successful treatment of seven patients with travel phobia using virtual reality combined with cognitive therapy, which required up to 12 sessions.

Patients suffering from travel phobia arising from RTAs per definition have been exposed to an event potentially associated with terror or pain as well as 'a threat to one's personal integrity', criteria associated with PTSD (American Psychiatric Association, 2000, p. 463). Furthermore, the symptomatology of PTSD and travel phobia arising after RTAs have been found to greatly overlap (Ehring, Ehlers, & Glucksman, 2006; McNally & Saigh, 1993; Taylor & Koch, 1995). Accordingly, it could be argued that at least a proportion of people suffering from travel phobia would benefit from psychological interventions specifically aimed at resolving the memories of their earlier road traffic incident. An example of this approach was used by Blonstein (1988) who combined *in vivo* exposure, and imaginary exposure during the treatment of a 41-year-old woman with a travel phobia arising following an RTA. Of the 33 weekly sessions, 22 involved imaginary exposure to the memory of the traumatic event, and the remaining sessions were *in vivo* exposure. Horne (1993) reported on

the treatment of seven patients with travel phobia arising from RTAs, three of whom were also diagnosed with PTSD. Patients received a program of Cognitive Behavioural Therapy (CBT) treatment, which consisted of elements of imaginary and *in vivo* exposure, cognitive restructuring and relaxation. The author reported successful treatment outcomes for all patients with treatment being particularly rapid for those without co-morbid PTSD, taking between six and nine sessions. More recently, a study evaluated the treatment of a consecutive case series of 11 individuals referred for clinically significant travel phobia following the London bombings in 2005 (Handley, Salkovskis, & Ehlers, 2008). Patients underwent a programme consisting of three to 17 sessions of *in vivo* exposure presented as behavioural experiments for phobic avoidance alone ( $n = 4$ ), while the others ( $n = 6$ ) also received Cognitive Therapy for PTSD (Ehlers, Clark, Hackman, McManus, & Fennel, 2005), which includes focussed work on the trauma memory. The results showed that all 10 patients who completed treatment had returned to their pre-bombing use of transport and reported minimal symptoms.

In one case, Eye Movement Desensitization and Reprocessing (EMDR), another recommended treatment for PTSD (Bisson et al., 2007; National Institute for Health and Clinical Excellence, 2005), was used to treat travel phobia. Protinsky, Sparks, and Flemke (2001) found positive effects with a 60-year-old woman with a phobia of driving following an RTA. Five previous sessions of systematic desensitization had turned out to be unsuccessful. Six subsequent sessions in which EMDR was combined with *in vivo* exposure proved to be beneficial and gains were maintained for 6 months.

Given the dearth of information regarding the treatment of travel phobia, and the fact that the usefulness and the effectiveness of a trauma-focused treatment approach for traumatically induced types of phobias is largely unknown, the purpose of the present study was to evaluate the applicability of Trauma-Focused Cognitive Behavioural Therapy (TF-CBT) and Eye Movement Desensitization and Reprocessing for travel phobia and travel anxiety resulting from RTAs. Patients of both conditions also received homework assignments for exposure to phobic situations. Since it is less common in EMDR than in CBT to carry out exposure homework assignments, we use the term 'EMDR plus *in vivo* exposure' when referring to the EMDR condition. It was hypothesized that TF-CBT and EMDR, both treatment approaches that mainly focus on the processing of traumatic memories, in

this study related to road traffic accidents, would generate positive effects on symptoms of anxiety, depression, post-traumatic stress, and general well-being. Additional aims were to compare the required number of sessions in order to reach good end-state functioning of both treatments, and to examine whether type of road user group (i.e., driver, passenger, cyclist etc.) would affect treatment outcome. Since passengers have been shown to be particularly likely to develop travel anxiety (Mayou & Bryant, 2001), it was examined whether response to treatment would differ among different road users.

## METHOD

### Participants

The sample consisted of 184 individuals aged over 18 who had been involved in an RTA, and were experiencing anxiety regarding travel as a result. Patients were referred to a psychological rehabilitation provider by insurance companies and solicitors, and were in the process of making personal injury claims. In the UK, it is incumbent on the claimants to engage in appropriate rehabilitation to mitigate their losses.

The main exclusion criterion was the presence of comorbid PTSD. Data were collected with the understanding and written consent of each subject, and according to the ethical principles described in the Declaration of Helsinki. Due to the nature of the referrals, participants were not excluded on the basis of medication use or prior psychologi-

cal treatment. Patients were aged between 18 and 84, with a mean age of 41 years. There were substantially more females ( $n = 133$ ) than males ( $n = 51$ ) in the sample, which is consistent with previous reports that travel anxiety is more common in females than in males (Mayou & Bryant, 2001; Mayou et al., 1991). See Table 1 for summary details of the sample.

### Procedure

The sample consisted of consecutive patients who were allocated to therapists nationwide to receive treatment with either TF-CBT or EMDR. No form of selection or self-selection took place as allocation to therapist, and thus treatment condition, was based on the geographical location of the therapist and the patient. The closest available therapist to the patient was selected on referral to the study, and this determined which treatment the patient received. One hundred and twenty-five people (68%) received TF-CBT, and the remaining 59 (32%) received 'EMDR + *in vivo* exposure'.

Intake diagnoses for Axis I disorders were established using criteria from the *Diagnostic and Statistical Manual of Mental Disorders*, 4th ed., Text Revision (DSM-IV-TR) at initial assessment (American Psychiatric Association, 2000). Patients with fear of travelling secondary to other anxiety disorders, such as panic disorder, agoraphobia, and PTSD, were excluded from the present sample. Diagnosis of specific (i.e., travel) phobia was made by the independent medico-legal expert (a consultant psychiatrist or clinical psychologist) in the first

Table 1. Summary details for patients in each treatment group

		CBT <i>n</i> = 125	EMDR + <i>in vivo</i> exposure <i>n</i> = 59
Gender	Male	30 (24.0%)	21 (35.6%)
	Female	95 (76.0%)	38 (64.4%)
Age	Mean (SD)	42.62 (14.32)	38.37 (14.18)
Diagnosis	Travel phobia	67 (53.6%)	38 (64.4%)
	Travel anxiety	58 (46.4%)	21 (35.6%)
Road user group	Driver	78 (63.4%)	29 (49.2%)
	Passenger	33 (26.8%)	19 (32.2%)
	Motorcyclist	5 (4.1%)	4 (6.8%)
	Pedestrian	6 (4.9%)	4 (6.8%)
	Cyclist	0	3 (5.1%)
	Horse rider	1 (0.8%)	0
Months since accident	Mean (SD)	17.27 (11.27)	22.10 (12.86)

CBT, Cognitive Behavioural Therapy; EMDR, Eye Movement Desensitization and Reprocessing.

instance before referral and subsequently by the treating therapist as more than 6 months may have elapsed since the first report. The diagnosis was confirmed by the overseeing clinical psychologist. If patients did not meet all *DSM-IV* criteria for specific phobia, but displayed anxiety regarding travel-related situations, they were classified in the present research as experiencing travel anxiety.

Treatment was terminated prior to completion in 23% of cases. In the CBT group 31 people (25%), and in the 'EMDR + *in vivo* exposure' group 11 people (19%) did not complete treatment. Treatment was terminated early for a variety of reasons including legal settlement of the case, termination by the referring body and by the patient themselves. Overall 142 patients (94 in the TF-CBT group, 48 in the 'EMDR + *in vivo* exposure' group) completed treatment.

### Treatment

Treatment was administered by 125 therapists nationwide who were approved to treat patients by the psychological rehabilitation provider which received the referrals. Of these, 87 treated patients were in the TF-CBT group, and 46 treated patients in the 'EMDR + *in vivo* exposure' group. All therapists were accredited with a professional body (such as the British Association for Behavioural and Cognitive Psychotherapies, UK Council for Psychotherapy, and British Psychological Society), and held approved qualifications in CBT or EMDR, respectively.

In TF-CBT, the patient is guided through a vivid remembering of the trauma until extinction occurs. TF-CBT is generally applied using imaginal and *in vivo* forms of exposure, as well as elements of cognitive restructuring, relaxation, and anxiety management (Rothbaum, Meadows, Resick, & Foy, 2000). Imaginal exposure involves presenting relevant cues in imagery and describing details of an event or set of events. *In vivo* exposure can be applied as homework tasks and behavioural experiments to reduce avoidance and promote the opportunity to evoke mastery through observing that no real danger exists. In the present study, imaginal exposure was applied during sessions, as well as cognitive restructuring and anxiety management techniques, and *in vivo* homework was given, for which patients were expected to confront situations regularly without the therapist (e.g., returning to the scene of the accident or self-exposure to cars or other anxiety provoking cues). *In vivo* exposure during treatment sessions (e.g.,

therapist accompanying the client driving a car) was discouraged for safety and insurance reasons.

In EMDR patients are requested to attend to a distracting (or 'dual attention') stimulus. Typically the patient is requested to visually track the therapist's fingers moving from side to side in front of the patient's eyes, while holding in mind a memory of a distressing event. Rather than providing a narrative of the details of the event, as is done in TF-CBT, patients are encouraged to follow their own course, moving freely in time, attending to emotions, inner sensations and cognitions, thereby omitting verbal communication about the content if they wish. The EMDR procedure is an eight-phase protocol (Shapiro, 2001) involving a three pronged approach of past, present, and future. It includes the following steps: (a) alleviating the distress related to one or more old memories; (b) deconditioning the effects of present stimuli that trigger the fear response; and (c) preparing the patient for future confrontations with the conditioned stimuli by self-managed homework assignments in a similar way as was done in the TF-CBT condition. Therefore, the intervention was named 'EMDR + *in vivo* exposure'.

Treatment was administered in one hour sessions, given weekly in the majority of cases. However, some patients experienced longer delays between sessions due to other commitments and illness. No manualized treatment protocols were used, and due to the wide network of therapists administering treatment, no evaluation of treatment fidelity was possible. However, monthly reports of all individual patients' treatment were assessed by a clinical psychologist (M.H.) with extensive training in and experience of both CBT and EMDR, in order to monitor adherence to treatment protocols. No maximum was imposed regarding the number of sessions which could be administered. Instead, monthly progress reports and frequent contact with therapists was maintained, and patients were considered to have completed treatment either (a) when they reached good end-state functioning, defined as scoring in the 'normal' range on the psychometrics and no longer experiencing significant anxiety regarding travel, i.e., being able to use their preferred mode of travel on all types of roads and road conditions during their treatment time, or (b) when it was agreed that the patient's improvement had plateaued or they were unlikely to make significant further progress in treatment. This usually implied that they were able to use their preferred mode of travel but that they, for example, chose not to use motorways, but only adhere to local roads.

## Measures

Outcome measures were as follows: drop-out rate, number of treatment sessions required, therapist rating of outcome, and a range of self-report psychometric measures. Therapist-rated outcome was measured on a four-point Likert-type scale, on which the treating therapist indicated the degree of progress made by the patient at discharge (i.e., 'successful', 'good progress', 'some improvement' and 'no improvement'). In order to receive a rating of 'successful' patients had to demonstrate good end-state functioning (i.e., returned to their pre-accident adjustment related to road travel). To receive a rating of 'good progress', the patient had to display behavioural change regarding their phobia (i.e., travel on local roads or with specific drivers). A number of psychometric self-report measures were taken at initial assessment (prior to treatment commencement), after every four sessions, and at discharge (when patients were judged to have clinically completed treatment). These were as follows:

*General Health Questionnaire (GHQ28)*: The GHQ-28 (Goldberg & Hillier, 1979) is a 28-item questionnaire that assesses four aspects of health functioning: (a) somatic symptoms (assessed with items such as 'have you recently been feeling perfectly well and in good health?'); (b) anxiety and insomnia (assessed with items such as 'have you recently lost much sleep over worry?'); (c) social dysfunction (assessed with items such as 'have you recently been managing to keep yourself busy and occupied?'); (d) severe depression (assessed with items such as 'have you recently been thinking of yourself as a worthless person?'). Items are rated on a four-point scale, and scored to give a range of 0–7 for each subscale, and 0–28 for the total score.

*Impact of Event Scale (IES)*: The IES (Horowitz, Wilner, & Alvarez, 1979) is a self-report scale which measures the psychological impact of a traumatic event on an individual and is one of the most widely used self-report instruments of post-traumatic stress (Joseph, 2000). The IES consists of 15 items which evaluate symptoms of intrusions (e.g., 'Pictures about it popped into my mind') and avoidance (e.g., 'I stayed away from reminders about it') related to a traumatic event. Items are rated on a four-point scale of frequency, ranging from 'not at all' (0), 'rarely' (1), 'sometimes' (3) to 'often' (5). The scores are summed to produce a range of 0–75 for the total score.

*Hospital Anxiety and Depression Scale (HADS)*: This commonly used scale, developed by Zigmond and

Snaith (1983), is a 14-item questionnaire, of which seven items measure the frequency of anxiety symptoms (e.g., 'Worrying thoughts go through my mind'), and the remaining items measure depression symptoms (e.g., 'I look forward with enjoyment to things'). Items are scored on a 4-point scale of frequency or agreement, giving a range of 0–21 for each subscale, and 0–42 for the total score.

## Analytic Strategy

Baseline analyses were conducted using Pearson's chi-square and *t*-tests to compare the CBT and 'EMDR + *in vivo* exposure' groups on baseline measures. Each of the outcome measures was then analysed to explore differences between treatment groups, and those with travel phobia compared with travel anxiety. For all except drop-out rate, completers' analyses were undertaken first, followed by intention-to-treat analyses conducted using a last-observation-carried-forward procedure to impute missing data.

In order to compare the effect of treatment on the scores on the psychometric measures, and differences in treatment effects between the diagnoses, one method would have been to use analysis of covariance (ANCOVA) on the scores at discharge, using scores at initial assessment as covariates. However, ANCOVA could not be conducted due to violation of the homogeneity of regression slopes assumption, rendering this analysis inappropriate (Pallant, 2007). Thus, mixed analyses of variance (ANOVAs) were conducted on each scale, with time (initial assessment, discharge) as a within-subjects factor, and treatment and diagnosis as between-subjects factors.

Pearson's chi-square analysis was used for categorical outcome measures. Finally, the impact of type of road user (i.e., passenger, driver, motorcyclist) was explored in a set of analyses using ANOVA and chi-square.

Effect sizes for the pre- to post-treatment comparison were calculated for the total score on the each of the psychometrics using Cohen's *d*, and Cohen's (1988) guidelines for magnitude (i.e., small = .2, medium = .5, large = .8). These are reported separately for each treatment.

Clinically meaningful change was calculated in two ways. First, by considering the proportion of patients scoring in the disordered range on each psychometric scale's total score at initial assessment, and whose scores had dropped into the normal range by discharge. Patients' total scores on the GHQ, IES, and HADS were classified as

being in the normal or disordered range at initial assessment and discharge as follows: on the GHQ if they fell below 13, on the IES if they fell below 27, and on the HADS if they fell below 16. The proportion of patients whose scores fell to within the normal range was compared between treatment groups using Pearson's chi-square. Second, the *degree* of change during treatment was assessed using Jacobson and Truax's (1991) description of a 'reliable change index', proposed by Christensen and Mendoza (1986). Reliable change (RC) was calculated as the initial assessment score—discharge score/standard error of this difference. If the RC exceeded 1.96, then the post-treatment score was considered likely to reflect a real and clinically meaningful change for that patient. Again this was compared between treatment groups using Pearson's chi-square. All analyses reported were assessed using an alpha of 0.05.

## RESULTS

### Baseline Differences

Initial analyses revealed no difference in the number of males and females in each group,  $\chi^2(1) = 2.69$ ,  $p = 0.10$ , or in the proportion of patients with travel phobia and anxiety in each group,  $\chi^2(1) = 1.91$ ,  $p = 0.17$ . Difference in age approached significance [ $t(182) = 1.88$ ,  $p = 0.06$ ] where those in the 'EMDR + *in vivo* exposure' group were older (CBT:  $M = 38.37$  years,  $SD = 14.18$ ; 'EMDR + *in vivo* exposure':  $M = 42.62$  years,  $SD = 14.32$ ). There was also a significant difference in the number of months since the accident [ $t(182) = 2.59$ ,  $p = 0.01$ ] where those in the 'EMDR + *in vivo* exposure' group had a longer delay since their accident (CBT:  $M = 17.27$

months,  $SD = 11.27$ ; 'EMDR + *in vivo* exposure':  $M = 22.10$  months,  $SD = 12.86$ ).

### Drop-Out Rate

As previously noted, treatment was terminated early in 42 cases for a variety of reasons, including legal settlement and termination of treatment by the referring body. However, notably few cases were terminated by the patient themselves. Overall only 11.4% of patients dropped out of treatment: 17 patients (13.6%) in the CBT group and four patients (6.8%) in the 'EMDR + *in vivo* exposure' group. In total, in the CBT group 94 patients (75.2%) completed treatment, and in the 'EMDR + *in vivo* exposure' group 48 patients (81.4%) completed. Chi-square analysis examined the proportions of completers, drop-outs and other terminations between the two treatment groups and the two diagnostic groups, and found no differences due to treatment [ $\chi^2(2) = 1.85$ ,  $p = 0.40$ ] or diagnosis [ $\chi^2(2) = 3.60$ ,  $p = 0.17$ ].

### Completer Analysis

#### Self-Report Psychometrics

Mixed ANOVAs were conducted on each scale, with score as the dependent variable, time (initial assessment, discharge) as a within-subjects factor, and treatment and diagnosis as between-subjects factors. Means and standard deviations split by diagnosis and treatment for the total scores on the GHQ, IES and HADS are shown in Table 2.

On the GHQ total score, ANOVA revealed a main effect of time [ $F(1,115) = 95.75$ ,  $p < 0.001$ ], but no significant effect of treatment [ $F(1,115) = 0.18$ ,

Table 2. Means (and standard deviations) at initial assessment and discharge on the GHQ, IES and HADS split by diagnosis and treatment

Diagnosis	Treatment	Time	GHQ	IES	HADS
Phobia	CBT	Assessment	10.30 (6.71)	30.76 (12.92)	19.21 (8.10)
		Discharge	2.59 (4.07)	9.39 (10.37)	9.93 (7.46)
	EMDR + <i>in vivo</i> exposure	Assessment	9.76 (6.56)	38.28 (13.49)	20.08 (6.32)
		Discharge	2.12 (3.57)	8.56 (11.30)	6.08 (5.74)
Anxiety	CBT	Assessment	10.49 (7.96)	25.85 (13.99)	18.27 (6.96)
		Discharge	2.51 (4.12)	8.10 (7.81)	8.84 (6.94)
	EMDR + <i>in vivo</i> exposure	Assessment	11.18 (8.05)	38.71 (16.73)	19.00 (8.58)
		Discharge	4.47 (6.30)	22.47 (19.06)	12.94 (10.41)

CBT, Cognitive Behavioural Therapy; EMDR, Eye Movement Desensitization and Reprocessing; GHQ, General Health Questionnaire; IES, Impact of Event Scale; HADS, Hospital Anxiety and Depression Scale.

Table 3. Effect sizes (Cohen's *d*) for each treatment for pre- to post-treatment change for the completer and intent-to-treat analyses

		CBT	EMDR + <i>in vivo</i> exposure
Completer analysis	GHQ total score	1.33	1.14
	IES total score	1.70	1.46
	HADS total score	1.27	1.15
Intent-to-treat analysis	GHQ total score	1.17	1.15
	IES total score	1.53	1.33
	HADS total score	1.13	1.12

CBT, Cognitive Behavioural Therapy; EMDR, Eye Movement Desensitization and Reprocessing; GHQ, General Health Questionnaire; IES, Impact of Event Scale; HADS, Hospital Anxiety and Depression Scale.

$p = 0.67$ ], or diagnosis [ $F(1,115) = 1.02, p = 0.31$ ], and no significant interactions [ $F$ 's  $< 1$ ]. Therefore, scores on the GHQ decreased substantially between initial assessment and discharge, but this reduction did not differ between the treatments or between those with travel phobia and those with travel anxiety. Analysis of the four subscales of the GHQ revealed no significant interactions of time with treatment or diagnosis, on any subscale [largest  $F(1,94) = 1.92, p = 0.17$ ].

Similarly, analysis of the total score on the IES revealed main effects of time [ $F(1,116) = 182.27, p < 0.001$ ], and treatment [ $F(1,116) = 17.60, p < 0.001$ ], but not of diagnosis [ $F(1,116) = 1.01, p = 0.32$ ]. With respect to the main effect of treatment (see Table 2), subsequent  $t$ -tests revealed that patients in the 'EMDR + *in vivo* exposure' group reported higher levels of both pre-treatment anxiety [ $t(133) = 3.89, p < 0.001$ ], and post-treatment anxiety [ $t(120) = 2.81, p < 0.001$ ]. The only significant interaction involving time was with diagnosis [ $F(1,116) = 7.38, p = 0.01$ ]; that is, while the IES total score was reduced between initial assessment and discharge, this effect was significantly greater for those with a diagnosis of travel phobia than for those with travel anxiety. In a further analysis of the two subscales from the IES (i.e., intrusions and avoidance), the interaction between time and diagnosis remained significant for both subscales [ $F$ 's(1,112) = 8.69 and 3.99, respectively,  $p$ 's = 0.01 and 0.05]. No other significant interactions involving time emerged. Therefore, both intrusion and avoidance symptoms were reduced to a greater extent in the travel phobia group than the travel anxiety group. No significant three-way interaction (between time, diagnosis and treatment) was present on the IES [ $F(1,116) = 2.45, p = 0.12$ ].

With regard to the total score on the HADS, again the main effect of time was significant [ $F(1,104) =$

102.99,  $p < 0.001$ ]. However, the main effect of treatment was not significant [ $F(1,104) = 0.12, p = 0.74$ ], and neither was the effect of diagnosis [ $F(1,104) = 0.48, p = 0.49$ ]. Two significant interactions emerged. First, there was an interaction between time and diagnosis [ $F(1,104) = 4.16, p = 0.04$ ]. This revealed that those with travel phobia experienced a greater reduction in symptoms as measured by the HADS than those with travel anxiety. There was also a significant three-way interaction between time, diagnosis, and treatment [ $F(1,104) = 4.48, p = 0.04$ ]. This showed that for those with travel phobia, 'EMDR + *in vivo* exposure' resulted in the greatest drop in HADS score, whereas for the travel anxiety group, 'EMDR + *in vivo* exposure' resulted in the smallest drop in score [ $F(1,104) = 6.24, p = 0.02$ ]. Separate analyses of the anxiety and depression subscales revealed that the significant three-way interaction was restricted to the anxiety subscale [ $F(1,104) = 5.44, p = 0.02$ ], and was non-significant for the depression subscale [ $F(1,104) = 1.89, p = 0.17$ ]. All other interactions were non-significant for these subscales.

On the total score for each scale, the effect sizes for the two treatments were calculated for the pre- to post-treatment comparison. These effect sizes, shown in Table 3, were very large for both treatments, and were slightly larger for the CBT group than the 'EMDR + *in vivo* exposure' group.

#### Therapist-Rated Outcome

Therapist-rated outcome indicated that both treatments were highly effective. Overall, 67.6% of cases were rated as being 'successful' by the treating therapist (i.e., having reached good end-state functioning), 21.8% were rated as having made 'good progress', and 8.5% were rated as 'some improvement'. Only 2.1% (i.e., three patients) made no improvement during treatment. A comparison was

Table 4. Proportion of patients scoring in the disordered range at initial assessment who scored in the normal range at discharge, and Pearson's chi-square for treatment difference

		CBT	EMDR + <i>in vivo</i> exposure	$\chi^2$
Phobia	GHQ	93.8%	100%	0.39, $p = 0.53$
	IES	88.9%	85.7%	0.09, $p = 0.77$
	HADS	69.6%	88.9%	1.29, $p = 0.26$
Anxiety	GHQ	92.9%	75.0%	1.00, $p = 0.32$
	IES	90.9%	61.5%	4.41, $p = 0.04$
	HADS	81.0%	60.0%	1.55, $p = 0.21$

CBT, Cognitive Behavioural Therapy; EMDR, Eye Movement Desensitization and Reprocessing; GHQ, General Health Questionnaire; IES, Impact of Event Scale; HADS, Hospital Anxiety and Depression Scale.

then conducted of the number of patients receiving each of the four levels of therapist-rated outcome between the two treatment groups, and the two diagnostic groups. Chi-square analysis revealed no significant difference in rated outcome between the diagnoses [ $\chi^2(3) = 1.33$ ,  $p = 0.72$ ], or between the treatments [ $\chi^2(3) = 5.27$ ,  $p = 0.15$ ].

#### Number of Sessions

Across all completers, regardless of outcome, an average of 8.11 sessions ( $SD = 3.71$ ) were required. However, it may be more meaningful to consider those who reached good end-state functioning, for whom an average of 7.34 sessions ( $SD = 3.21$ ) were required. Only four patients (4.2%) required more than 12 sessions, and the maximum was 16. ANOVA was used to compare the number of sessions required to reach good end-state functioning with treatment group (CBT, 'EMDR + *in vivo* exposure') and diagnosis (phobia, anxiety) as between-subjects factors. Neither treatment [ $F(1,92) = 0.75$ ,  $p = 0.39$ ], nor diagnosis [ $F(1,92) = 2.11$ ,  $p = 0.15$ ], were significant, and the interaction was also not significant [ $F(1,92) = 0.89$ ,  $p = 0.35$ ]. Therefore, the number of sessions required did not differ between those with phobia ( $M = 7.69$  sessions,  $SD = 3.06$ ) and those with anxiety ( $M = 6.96$  sessions,  $SD = 3.37$ ), or between treatment groups (CBT:  $M = 7.48$  sessions,  $SD = 3.29$ ; 'EMDR + *in vivo* exposure':  $M = 7.03$  sessions,  $SD = 3.07$ ).

#### Intention-To-Treat Analysis

Intention-to-treat analyses revealed no qualitative differences to the completer analyses, except that the three-way interaction for the HADS total score was no longer significant [ $F(1,124) = 2.51$ ,  $p = 0.12$ ]. The effect sizes for the effects of treatments

from initial assessment to discharge remained very large, as in the completer analysis, as shown in Table 3. Only the effect size for the IES was larger for the CBT group than the 'EMDR + *in vivo* exposure' group.

#### Clinically Significant Change

In order to examine clinically significant change, the number of patients in each treatment group who scored in the disordered range at initial assessment, and whose scores had decreased into the normal range at discharge, was analysed, and are presented in Table 4. The only significant difference in these proportions was on the IES, specifically for those with travel anxiety. On this measure, more travel anxiety cases moved into the normal range at discharge in the CBT group (90.9%) than in the 'EMDR + *in vivo* exposure' group (61.5%). The results of analyses concerning the Reliable Change Index (Jacobson & Truax, 1991) are presented in Table 5. On all the scales, over 70% of patients' scores changed reliably. As can be seen, there were no significant differences between treatments in these proportions.

#### Differences Between Road Users

From Table 1 it is clear that the majority of patients were either drivers or passengers at the time of the accident. Only 23 patients were motorcyclists, pedestrians, cyclists or horse riders. Therefore, analysis of road user group was restricted to a comparison of drivers and passengers due to very small numbers in the other groups. In total there were 107 drivers, of which 85 completed

Table 5. Proportion of cases showing reliable change in each group, and Pearson's chi-square for treatment difference

		CBT	EMDR + <i>in vivo</i> exposure	$\chi^2$
Phobia	GHQ	78.3%	76.5%	0.02, $p = 0.88$
	IES	91.3%	94.4%	0.18, $p = 0.67$
	HADS	83.3%	100%	2.48, $p = 0.12$
Anxiety	GHQ	74.4%	82.4%	0.42, $p = 0.52$
	IES	79.5%	76.5%	0.06, $p = 0.80$
	HADS	86.5%	68.8%	2.30, $p = 0.13$

CBT, Cognitive Behavioural Therapy; EMDR, Eye Movement Desensitization and Reprocessing; GHQ, General Health Questionnaire; IES, Impact of Event Scale; HADS, Hospital Anxiety and Depression Scale.

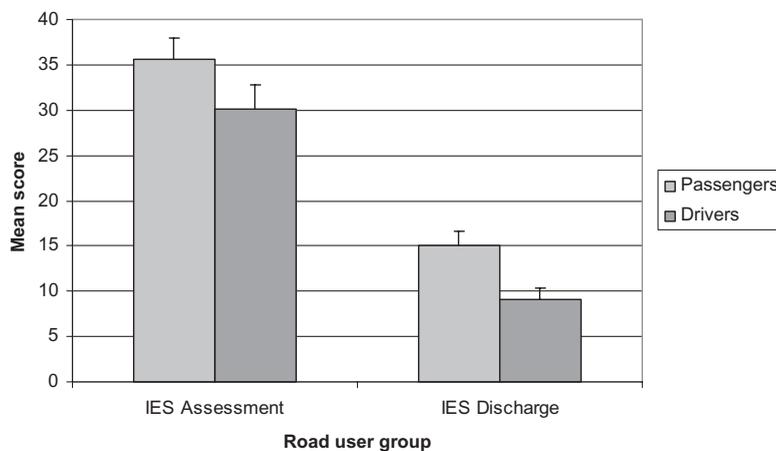


Figure 1. Impact of Event Scale (IES) total score at initial assessment and discharge for passengers and drivers (error bars represent +1 standard error)

treatment, and 52 passengers, of which 39 completed treatment. There was no difference in the number of sessions required [ $t(122) = 0.42$ ,  $p = 0.67$ ; Drivers:  $M = 8.18$  sessions,  $SD = 3.92$ ; Passengers:  $M = 8.49$  sessions,  $SD = 3.51$ ]. There was also no difference in the therapist-rated outcomes for these groups [ $\chi^2(3) = 2.23$ ,  $p = 0.53$ ]. Of the drivers, 67.9% were rated as successful, 23.8% made good progress, 7.1% made some improvement and only 1.2% made no improvement. In the passengers group, 59.0% were successful, 28.2% made good progress, 7.7% made some improvement and 5.1% made no improvement.

Examining the results from the self-report psychometrics, some differences between drivers and passengers emerged. ANOVA with time (initial assessment, discharge) as a repeated measures factor and road user group (drivers, passengers) as a between-subjects factor was conducted for the

total score on each scale. On the GHQ, the effect of time was significant [ $F(1,101) = 97.41$ ,  $p < 0.001$ ], but the effect of road user group and the interaction of these factors were non-significant ( $F_s < 1$ ). Results for the HADS were similar, with a significant effect of time [ $F(1,93) = 87.97$ ,  $p < 0.001$ ], but a non-significant effect of road user group and interaction ( $F_s < 1$ ). Therefore, scores on both the GHQ and HADS did not differ between drivers and passengers, and the reduction in scores between initial assessment and discharge was not significantly different between these groups. However, on the IES, the effect of road user group was significant [ $F(1,102) = 6.42$ ,  $p = 0.01$ ], although the interaction with time was non-significant [ $F(1,102) = 0.02$ ,  $p = 0.89$ ]. As shown in Figure 1, scores at both initial assessment and discharge were higher for passengers than drivers, but the effect of treatment did not differ.

## DISCUSSION

This is probably the largest treatment study on travel phobia and travel anxiety to date, and the first study to investigate the applicability of two evidence-based psychological interventions for these conditions. The results show that both TF-CBT and 'EMDR + *in vivo* exposure' were followed by a clear reduction of symptomatology as indexed by therapist/patient ratings, and validated measures among both patients with specific phobia, and those with milder forms of travel anxiety. These improvements could be obtained within an average course of 7.3 sessions. This is somewhat lower in comparison with previous reports of up to 12 sessions of CBT treatment for travel phobia in case studies and studies with small samples (Horne, 1993; Townend, 2003; Townend & Grant, 2006; Walshe et al., 2003). No indications were found that one treatment would be more beneficial than the other in terms of reduction of symptoms of anxiety, depression, PTSD, or other indicators of functioning. However, patients with travel phobia responded with a greater reduction of anxiety and PTSD symptoms than those with less severe forms of travel anxiety.

Although CBT has been proven to be efficacious for treatment of specific phobias (Choy et al., 2007; Wolitzky-Taylor et al., 2008), data indicating positive treatment effects in case of treating travel phobia is limited to a very small number of case studies. In all of these cases *in vivo* exposure was the core of the treatment protocol. Accordingly, an important outcome of the present study is that neither treatment condition involved formal *in vivo* exposure during treatment sessions. This suggests that a trauma-focused treatment approach for travel anxiety arising from road traffic accidents can be a viable option. Until now, exploration of the use of a trauma-focused approach for other conditions than PTSD has been very limited. The chief difference with *in vivo* exposure is that in the latter case patients are requested to focus their attention on the fear-evoking stimulus (CS) to investigate its predictive value, whereas in EMDR or TF-CBT, the focus is the memory of the traumatic incident that caused the fear response (representation of the UCS/UCR). Although it cannot be ruled out that homework assignments contributed to the treatment results, the present results support the claim that a trauma-focused treatment approach may be suitable for unprocessed memories which underlie not only PTSD, but also other types of anxiety disorders that developed following a distressing

event (De Jongh, Ten Broeke, & Renssen, 1999; De Jongh, Van den Oord, & Ten Broeke, 2002; De Jongh & Ten Broeke, 2009).

CBT for travel phobia might include returning to the scene of the accident with the patient driving (Blanchard & Hickling, 1997). However, therapist-assisted *in vivo* exposure in the present study was not encouraged due to safety and insurance issues precluding clinicians from accompanying patients in cars (Towergate Professional Risks, personal communication, 14 November 2008). Despite this potential limitation, it would seem that through the application of imaginal exposure and other elements of their treatment, many patients in both treatment conditions felt safe and enabled enough to carry out their homework assignments, encountering travel-related situations on their own. These included activities such as returning to the site of the accident or driving their car or motorcycle again. For example, in one particular case, a 31-year-old man was knocked from his motorbike and subsequently developed a phobia of travelling by motorbike. He attempted to travel as a car passenger to work instead, but this also evoked high levels of anxiety. Eventually his family moved house so he could travel to work by tube. During treatment he started with homework exposure tasks, and at discharge from treatment he was able to ride his motorbike again with confidence in a variety of situations, and considered himself 'over 90% confident in all vehicle-related situations'.

Analysis of the effect of road user group on treatment outcome showed that symptoms of trauma may be a particular problem for those who were passengers at the time of the accident. Passengers' scores on the IES showed that they reported more trauma-related symptoms than drivers did. This supports previous research which has shown that passengers are particularly susceptible to travel anxiety compared to other types of road user (Mayou & Bryant, 2001), perhaps due to a greater sense of lack of control compared to drivers at the time of the accident. Therefore, people who are passengers during an RTA may be particularly at risk of negative psychological reactions to trauma, and as such may be more likely to require treatment for such problems than other types of road users. However, the results suggest no differential treatment effects regarding drivers and passengers on any measure. Hence, while passengers may be particularly affected by RTAs, treatment should be offered to all patients with travel anxiety or phobia, regardless of class of road user during the RTA.

A number of limitations of the current research should be acknowledged. First, due to the absence of manualized treatment protocols it is not clear whether the therapists all uniformly practiced a standardized CBT versus EMDR treatment for travel phobia. The therapists were certified in TF-CBT or EMDR, and monthly reports of all individual patients' treatment were assessed in order to monitor adherence to treatment protocols. However, since formal treatment integrity checks were not performed, the interventions could have been variable in terms of how competently the therapists performed their respective treatments. Second, the absence of a no-treatment control group made it impossible to rule out the threat regression to the mean, or to refute the explanation that the results were not due to therapy, but simply to time or therapist contact. However, with regard to the latter we would suggest this is unlikely since in the majority of cases (67%) the anxiety had persisted for more than a year, and had not resolved in the absence of intervention. Furthermore, both treatment approaches produced clinically relevant and statistically significant reductions in a variety of symptoms. Most patients (i.e., 31 out of 46) appeared to make good progress by the end of treatment, the size of the treatment effects appears to be large, and larger than would be expected from being the result of non-specific effects alone. Yet, due to the lack of follow-up assessments it is not impossible that individual patients who initially showed good treatment outcome benefits experienced a later relapse. Third, the lack of randomization to the two treatments limits any kind of conclusions that can be drawn from the results from each treatment. Clearly, non-randomization was an unfortunate result of the community treatment setting. Although the fact that patients were allocated based on the availability of a therapists in the area where they lived may have limited the occurrence of systematic differences between the groups, the question of relative efficacy remains unanswered. Accordingly, the data should be considered a precursor to more rigorous outcome research such as establishing the relative efficacy of TF-CBT or EMDR versus a pure *in vivo* exposure approach by means of a randomized controlled trial. Fourth, it is unclear to what extent the fact that patients were in the process of seeking compensation for personal injury may have influenced their motivation for treatment as well as their reporting of symptoms before and after treatment. For example, it is not impossible that patients had been motivated to exaggerate their symptom

reports at the beginning of treatment as this could have helped their personal injury claims. Fifth, treatment was terminated when further therapist contact was not considered necessary. However, we were unable to use blind raters of outcome, as data were collected by the treating therapists who were located nationally. In addition, diagnoses were not assessed using structured clinical interviews, and no specific phobia scales or measures of behavioral outcome were used. This means that the main outcome variable was not directly assessed. Therefore, it may be that, albeit psychometric scores fell following treatment, this was not matched by behavioural change regarding travel. However, reported behavioural change was required for therapists/patients to give an outcome rating of 'successful' or 'good progress'. Nevertheless, future studies should aim to employ specific behavioural outcome measures which can be directly compared across treatments. Finally, it was hoped that patients would continue to expose themselves to phobic situations as they had been doing during treatment, and that their improvement would continue post-treatment. Unfortunately, this was not assessed because there was no permission from the insuring parties to do this. It would be interesting in future research to consider post-treatment progress and long-term outcomes from trauma-focused treatment for specific phobias.

Despite these limitations, one strength of the present study is that patients were drawn from the real world of clinical practice, thereby increasing the generalizability of the findings. At least one other strength which should not remain unmentioned is the inclusion of drop-outs in the outcome analyses. Most treatment outcome studies on specific phobias are based on study completers and fail to report intent-to-treat data (Hofmann & Smits, 2008). It is well known that patients with specific phobia tend not to seek treatment. Therefore, taking into account treatment motivation and adherence may help to decide which interventions are most suitable for particular patients and clinical circumstances.

Taken together, the present findings suggest that travel phobia and milder forms of travel anxiety following RTAs should be regarded as treatable psychological conditions if appropriate trauma-focused psychological treatment is provided. TF-CBT and EMDR, which in the present study was combined with homework assignments, both proved to be beneficial, requiring a limited number of sessions. Given the fact that RTAs are one of the

main causes of posttraumatic stress and related psychopathology in Western countries with potentially far reaching clinical, social, economic, and employment consequences, and that there is a complete lack of controlled studies supporting the effectiveness of psychological interventions for travel phobia, more rigorous outcome research is warranted and urgently needed.

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## REFERENCES

- American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders*, 4th ed., Text Rev. Washington, DC: Author.
- Bisson, J., Ehlers, A., Matthews, R., Pilling, S., Richards, D., & Turner, S. (2007). Psychological treatments for chronic post-traumatic stress disorder: Systematic review and meta-analysis. *British Journal of Psychiatry*, *190*, 97–104.
- Blanchard, E.B., & Hickling, E.J. (1997). *After the Crash: Assessment and Treatment of Motor Vehicle Accident Survivors*. Washington, DC: American Psychological Association.
- Blonstein, C.H. (1988). Treatment of automobile driving phobia through imaginal and *in vivo* exposure plus response prevention. *Behavior Therapist*, *11*, 70–86.
- Christensen, L., & Mendoza, J.L. (1986). A method of assessing change in a single subject: An alteration of the RC index. *Behavior Therapy*, *17*, 305–308.
- Choy, Y., Fyer, A.J., & Lipsitz, J.D. (2007). Treatment of specific phobia in adults. *Clinical Psychology Review*, *27*, 266–286.
- Cohen, J.W. (1988). *Statistical Power Analysis for the Behavioral Sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- De Jongh, A., Van den Oord, H.J.M., & Ten Broeke, E. (2002). Efficacy of Eye Movement Desensitization and Reprocessing (EMDR) in the treatment of specific phobias: Four single-case studies on dental phobia. *Journal of Clinical Psychology*, *58*, 1489–1503.
- De Jongh, A., & Ten Broeke, E. (2009). EMDR and the anxiety disorders: Exploring the current status. *Journal of EMDR Practice and Research*, *3*, 133–140.
- De Jongh, A., Ten Broeke, E., & Renssen M.R. (1999). Treatment of specific phobias with Eye Movement Desensitization and Reprocessing (EMDR): Protocol, empirical status, and conceptual issues. *Journal of Anxiety Disorders*, *13*, 69–85.
- Ehlers, A., Clark, D.M., Hackmann, A., McManus, F., & Fennell, M. (2005). Cognitive therapy for PTSD: Development and evaluation. *Behaviour Research and Therapy*, *43*, 413–431.
- Ehlers, A., Hofmann, S.G., Herda, C.A., & Roth, W.T. (1994). Clinical characteristics of driving phobia. *Journal of Anxiety Disorders*, *8*, 323–339.
- Ehring, T., Ehlers, A., & Glucksman, E. (2006). Contribution of cognitive factors to the prediction of post-traumatic stress disorder, phobia and depression after motor vehicle accidents. *Behaviour Research and Therapy*, *44*, 1699–1716.
- Ehring, T., Ehlers, A., & Glucksman, E. (2008). Do cognitive models help in predicting the severity of post-traumatic stress disorder, phobia, and depression after motor vehicle accidents? A prospective longitudinal study. *Journal of Clinical and Consulting Psychology*, *76*(2), 219–230.
- Goldberg, D.P., & Hillier, V.F. (1979). A scaled version of the General Health Questionnaire. *Psychological Medicine*, *9*(1), 139–145.
- Handley, R.V., Salkovskis, P.M., & Ehlers, A. (2009). Treating clinically significant avoidance of public transport following the London bombings. *Behavioural and Cognitive Psychotherapy*, *37*, 87–93.
- Hofmann, S.G., & Smits, J.A.J. (2008). Cognitive-Behavioral Therapy for adult anxiety disorders: A meta-analysis of randomized placebo-controlled trials. *Journal of Clinical Psychiatry*, *69*, 621–632.
- Horne, D.J. de L. (1993). Traumatic stress reactions to motor vehicle accidents. In J.P. Wilson, & B. Raphael (Eds.), *International Handbook of Traumatic Stress Syndromes* (pp. 499–506). New York: Plenum.
- Horowitz, M., Wilner, M., & Alvarez, W. (1979). Impact of Event Scale: A measure of subjective stress. *Psychosomatic Medicine*, *41*, 209–218.
- Jacobson, N.S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology*, *59*(1), 12–19.
- Joseph, S. (2000). Psychometric evaluation of Horowitz's Impact of Event Scale: a review. *Journal of Traumatic Stress*, *13*, 101–13.
- Kuch, K. (1997). Accident phobia. In G.C.L. Davey (Ed.), *Phobias: A Handbook of Theory, Research and Treatment* (pp. 153–162). Chichester, UK: John Wiley & Sons.
- Kuch, K., Cox, B.J., Evans, R., & Shulman, I. (1994). Phobias, panic, and pain in 55 survivors of road vehicle accidents. *Journal of Anxiety Disorders*, *8*(2), 181–187.
- Kuch, K., Swinson, R.P., & Kirby, M. (1985). Post-traumatic stress disorder after car accidents. *Canadian Journal of Psychiatry*, *30*(6), 426–427.
- Mathew, R.J., Weinman, M.L., Semchuk, K.M., & Levin, B.L. (1982). Driving phobia in the city of Houston: A pilot study. *American Journal of Psychiatry*, *139*, 1049–1051.
- Mayou, R. (1997) The psychiatry of road traffic accidents. In M. Mitchell (Ed.) *The Aftermath of Road Accidents: Psychological, Social and Legal Consequences of an Everyday Trauma* (pp. 33–48). London: Routledge.
- Mayou, R., & Bryant, B. (2001). Outcome in consecutive emergency department attenders following a road traffic accident. *British Journal of Psychiatry*, *179*, 528–534.
- Mayou, R., & Bryant, B. (2002). Outcome 3 years after a road traffic accident. *Psychological Medicine*, *32*, 671–675.

- Mayou, R., Bryant, B., & Duthie, R. (1993). Psychiatric consequences of road traffic accidents. *British Medical Journal*, 307(6905), 647–651.
- Mayou, R., Bryant, B., & Ehlers, A. (2001). Prediction of psychological outcomes one year after a motor vehicle accident. *American Journal of Psychiatry*, 158(8), 1231–1238.
- McNally, R.J., & Saigh, P.A. (1993). On the distinction between traumatic simple phobia and post-traumatic stress disorder. In J.T.R. Davidson, & E.B. Foa (Eds.), *Post-traumatic Stress Disorder: DSM-IV and Beyond* (pp. 207–212). Washington, DC: American Psychiatric Press.
- Munjack, D.J. (1984). The onset of driving phobias. *Journal of Behavior Therapy and Experimental Psychiatry*, 15(4), 305–308.
- National Collaborating Centre for Mental Health. (2005). *Post-traumatic Stress Disorder: The Management of PTSD in Adults and Children in Primary and Secondary Care*. London: National Institute for Clinical Excellence.
- Pallant, J. (2007). *SPSS Survival Manual: A Step-by-step Guide to Data Analysis Using SPSS Version 15*. Maidenhead, UK: Open University Press.
- Protinsky, H., Sparks, J., & Flemke, K. (2001). Eye Movement Desensitization and Reprocessing: Innovative clinical applications. *Journal of Contemporary Psychotherapy*, 31(2), 125–135.
- Rothbaum, B.O., Meadows, E.A., Resick, P., & Foy, D.W. (2000). Cognitive-behavioral therapy. In E.B. Foa, T.M. Keane, & M.J. Friedman (Eds.), *Effective Treatments for PTSD: Practice Guidelines from the International Society for Traumatic Stress Studies* (pp. 61–83). New York: Guilford Press.
- Shapiro, F. (2001). *Eye-movement Desensitization and Reprocessing: Basic Principles, Protocols and Procedures*. New York: Guilford Press.
- Taylor, J.E. (2008). Driving phobia consequent to motor vehicle collisions. In M. Duckworth, T. Iezzi, & W. O'Donohue (Eds.), *Motor Vehicle Collisions: Medical, Psychosocial, and Legal Consequences* (pp. 389–416). London: Academic Press.
- Taylor, J., & Deane, F. (1999). Acquisition and severity of driving-related fears. *Behaviour Research and Therapy*, 37, 435–449.
- Taylor, J., Deane, F., & Podd, J. (2002). Driving-related fear: A review. *Clinical Psychology Review*, 22, 631–645.
- Taylor, S., & Koch, W.J. (1995). Anxiety disorders due to motor vehicle accidents: Nature and treatment. *Clinical Psychology Review*, 15(8), 721–738.
- Townend, M. (2003). Cognitive therapy for driving phobia: Two single case studies. *Behavioural and Cognitive Psychotherapy*, 31, 369–375.
- Townend, M., & Grant, A. (2006). Integrating science, practice and reflexivity—cognitive therapy with driving phobia. *Journal of Psychiatric and Mental Health Nursing*, 13(5), 554–561.
- Walshe, D.G., Lewis, E.J., Kim, S.I., O'Sullivan, K., & Wiederhold, B.K. (2003). Exploring the use of computer games and virtual reality in exposure therapy for fear of driving following a motor vehicle accident. *CyberPsychology & Behavior*, 6(3), 329–334.
- Wolitzky-Taylor, K.B., Horowitz, J.D., Powers, M.B., & Telch, M.J. (2008). Psychological approaches in the treatment of specific phobias: A meta-analysis. *Clinical Psychology Review*, 28, 1021–1037.
- Zigmond, A.S., & Snaith, R.P. (1983). The Hospital Anxiety and Depression Scale. *Acta Psychiatrica Scandinavica*, 67, 361–370.