

Evaluating a fatigue management training program for coach drivers.

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Abstract

A nonprescriptive fatigue management training program was developed that aimed at identifying specific factors contributing to coach driver fatigue and assisting coach drivers to develop more effective coping strategies to manage difficult or stressful work situations. The training program incorporated a strategy of presenting realistic, job related situations and multiple responses to drivers and asking them to indicate the effectiveness of each response in dealing with that situation. The advantage of using this methodology was that drivers were presented with stimulus material that was directly related to their work tasks, that is, had a high level of psychological fidelity. The evaluation of the training indicated that drivers who perceived the situational exercises as most realistic reported better training outcomes. Overall, the drivers reported positive reactions to the training, high levels of posttraining self efficacy, and strong level of transfer intentions.

Introduction

The Commonwealth of Australia House of Representatives Standing Committee on Communication, Transport and the Arts (2000) concluded that “in terms of cost and human impact the road transport sector constituted the major problem area for fatigue” (p. viii). The Committee sought to identify initiatives in the Australian transport industry that have addressed

the causes and effects of fatigue and discovered that some of these measures are recognised as being world's best practice.

Outline of the project

This paper discusses the development and implementation of a nonprescriptive fatigue management training program for long distance coach drivers that was developed as part of a fatigue management project conducted by the Psychology Department at the University of Southern Queensland. This project was aimed at identifying specific factors contributing to coach driver fatigue and assisting coach drivers to develop more effective coping strategies to manage difficult or stressful work situations. The ultimate aim of the program was to enhance the safety, health, and well being of coach drivers. The fatigue management project consisted of three stages. During the first stage of the project, a survey was conducted of express coach drivers to identify specific factors relating to stress and fatigue and determine the impact of these factors on the emotional and physical well being of coach drivers. Based on the results of the survey, training exercises were developed using the situational judgment test methodology to assist drivers to cope more effectively with difficult and stressful work situations. The final stage of the project involved an evaluation of the effectiveness of the training program. This paper will focus on the evaluation of the fatigue management training program.

Transactional model of driver stress

The theoretical basis for the fatigue management training program was work by Matthews and Desmond (2001) who described two basic strategies for developing interventions to ameliorate driver stress and fatigue. Matthews and Desmond proposed a transactional ergonomic framework that emphasised that both contextual factors and cognitive adaptive factors should be targets for fatigue management interventions. Matthews (2002) described a transactional model of driver stress that suggested that appraisal of external events and driver's specific choice of coping strategy play a key role in determining the subjective and behavioural outcomes of driving. Therefore, fatigue management training programs should be designed to intervene at the level of choice and regulation of coping.

The design of the training program focused on specific situations that coach drivers face in order to enhance the psychological fidelity of the content. It was also expected that using a common framework for generating

the responses to each situation would assist the drivers to recognise general principles that could be applied across many situations. Finally, it was expected that incorporating a variety of different situations would assist drivers to understand the framework and enhance their application of the training. These strategies were based on research that has examined the impact of various transfer enhancing activities occurring during training on the training and transfer outcomes (Machin, 2002). In particular, it was expected that the characteristics of training that would be most strongly related to the training outcomes would be those that were associated with the use of situational exercises (psychological fidelity, use of general principles, and stimulus variability).

Method

Development of the fatigue management training program

In order to develop appropriate situational items, a workshop was conducted with all of the coach driver supervisors from McCaffertys Express Coaches (N = 7), who served as subject matter experts (SMEs). The supervisors were instructed to think of realistic difficult or stressful situations that coach drivers might encounter that may induce driver stress or fatigue as well as response options for each situation. The supervisors were instructed to generate the responses based on the five coping styles, such that each situation had a Task focused, Reappraisal, Avoidance, Confrontive, and Emotion focused response. These five coping styles have been empirically identified in several samples of drivers (Matthews, 2002).

The main objectives of the fatigue management program were to assist coach drivers to distinguish between effective and ineffective coping styles, to improve the drivers confidence in using the effective coping strategies, and for the drivers to develop specific plans to implement effective coping strategies as part of their work. After an initial exercise aimed at identifying their generic coping styles, the drivers were given four of the scenarios generated by the driver supervisors. They were instructed to read each scenario, imagine it was happening to them, and to write down what they would think, how they would feel and what they would do in each case. This exercise was designed to enhance the drivers' awareness of how they appraise a situation, how their appraisal determines the intensity of the emotions involved in the encounter, and also how it affects their choice of coping style. The drivers were then asked to rate the responses generated by

the driver supervisors to those same four situations on a scale from 1 (Not at all effective) to 10 (Extremely effective).

The drivers were then asked to complete some additional exercises in differentiating between the five styles of coping. The final training exercise asked drivers to think of difficult work situations that they might be confronted with in the following four weeks. They were then asked to generate some effective ways of coping with these situations and to identify obstacles that may prevent them from implementing effective coping responses to these situations.

A follow up session was held four weeks after each group of drivers had completed the training session. At the follow up session, the drivers were provided with a handout consisting of the last four situational exercises they completed in training along with a summary of their ratings and a graphic comparison of their ratings to those of the driver supervisors. The drivers were then asked to describe an incident that happened to them at work during the past four weeks that was difficult or stressful. They were then asked how they dealt with the incident (i.e., what coping style they used), what the outcome was, and if they found anything they learned in training useful in dealing with the situation.

Participants

Seventeen drivers who were selected to participate in training by the Operations Manager at McCafferty's Express Coaches.

Pretraining Questionnaire

Prior to training, the *Driver Coping Questionnaire* (DCQ; Matthews, Desmond, Joyner, Carcary and Gilliland, 1997) was administered. It is a 35 item scale that assesses cognitive reactions to driving and asked respondents how they try to deal with driving stress. It measures five dimensions of coping derived from the transactional model of stress. The five coping dimensions include: Confrontive coping (e.g., relieving one's feelings through risk taking), Task focus (e.g., making an effort to drive safely), Emotion focus (e.g., criticising oneself for making mistakes), Reappraisal (e.g., viewing the drive as a learning experience), and Avoidance (e.g., trying to suppress negative feelings). The reliabilities for these subscales range from .67 to .78 (Machin and Hoare, 2003), which are lower than those found in Matthews et al.

Reactions to training

In order to assess their reactions to the training program, drivers were asked to rate seven statements on a scale from 1 (Strongly disagree) to 5 (Strongly agree). Examples included: *The training will help me to manage my fatigue*, and *I feel confident in my ability to manage fatigue now that I have completed this training*. The evaluation sheet also asked drivers to add any extra comments that would help to improve the fatigue management training package.

Posttraining Evaluation Questionnaire

The Posttraining Evaluation Questionnaire contained measures of:

1. *Posttraining Self Efficacy*, which was assessed using 12 items that focused on the trainees' confidence that they had mastered their training. For example, "*I can effectively use the skills which I learned*" ($\alpha = .84$).
2. *Transfer Implementation Intentions*, which were assessed using 22 items that were developed for this study. Eleven items focused on the trainees' intentions to engage in specific behaviours that would facilitate transfer of their skills (for example, "*I will look for opportunities to use the skills which I have learned*"; $\alpha = .76$). Another 11 items paired to these asked about the trainees' commitment to carrying out these intentions ($\alpha = .80$).
3. *Transfer Enhancing Activities Questionnaire* (TEAQ: Thayer and Teachout, 1995). This questionnaire contained 70 items grouped into eight subscales assessing the degree of in training, transfer enhancing activities. Only seven of the subscales were used in this study. Top Management Support (containing four items) was omitted. The remaining subscales were: *Overlearning* containing 10 items such as "During training, we practiced using the skills taught to us over and over" ($\alpha = .69$); *Fidelity* containing 11 items such as: "The problems we learned to solve during training are similar to those on the job" ($\alpha = .78$); *Stimulus Variability* containing six items such as: "During training, the instructors gave us a lot of different problems to work on" ($\alpha = .58$); *Principles/Meaningfulness* containing six items such as: "During training, the instructors never told us why, just what to do" ($\alpha = .64$); *Self-control Cues* (i.e., feedback cues) containing 13 items such as: "During training, we couldn't tell whether or not we made mistakes" ($\alpha = .76$); *Relapse Prevention* containing 13 items such as: "During training, we were told about problems we might have on the job in using what we learned" ($\alpha =$

.75); and *Goal Setting* containing seven items such as: “During training, we set goals for using our new skills on the job” ($\alpha = .52$).

Results

The means and standard deviations of the drivers’ DCQ scores completed prior to training are presented in Table 1. A comparison group of coach drivers who completed the Coach Driver Operations Survey (Machin, 2001) shows that the scores for the participants in the fatigue management training program were not significantly different on any of the scales.

Table 1
Means and Standard Deviations of Driver Coping Styles

Coping Style	Training participants ($N = 14$)		Australian Coach Drivers ($N = 96$)		t
	M	SD	M	SD	
Task focused	87.96	9.52	85.06	12.45	.84
Reappraisal	74.69	15.64	66.43	15.38	1.87
Avoidance	62.24	12.13	57.74	14.08	1.14
Confrontive	33.47	11.51	34.70	11.41	-.35
Emotion focused	44.90	7.80	42.95	11.48	.62

Note. Scores on all scales could range from 0 to 100.

The means and standard deviations of the drivers’ responses to the training reaction questions are presented in Table 2. Table 3 contains the means and standard deviations and intercorrelations of the drivers’ responses to the Posttraining Evaluation Questionnaire.

Table 2
Drivers' Reactions to the Training Session (N = 17)

Statement	<i>M</i>	<i>SD</i>
1. The training workbook was easy to follow.	4.24	.75
2. The scenarios were similar to the sorts of situations I might face.	4.29	.59
3. The training will help me to manage my fatigue.	3.53	.87
4. The exercises were pitched at an appropriate level for me.	4.00	.71
5. I feel confident in my ability to manage fatigue now that I have completed this training.	3.71	.85
6. The training took the right amount of time to cover the material.	3.59	.80
7. The instructors were easy to understand.	4.59	.51

Note. Scores on all scales could range from 1 to 5.

In order to determine the unique contribution of each of the seven subscales of the TEAQ to the prediction of the three training outcomes, Posttraining Self Efficacy, Transfer Implementation Intentions, and Commitment to Transfer Intentions were regressed separately on the seven predictors. The small sample size means that even sizable R^2 values and β weights will not necessarily be significant and therefore the only value that was considered was the magnitude of the semi-partial correlation coefficient (*sr*). Fidelity was the strongest predictor of Posttraining Self Efficacy (*sr* = .61), a strong predictor of Transfer Implementation Intentions (*sr* = .41), and a strong predictor of Commitment to Transfer Implementations (*sr* = .41). Principles/Meaningfulness was only a weak predictor of Posttraining Self Efficacy (*sr* = .14), Transfer Implementation Intentions (*sr* = .02), and Commitment to Transfer Implementations (*sr* = -.04). Stimulus Variability was a moderately strong predictor of Posttraining Self Efficacy (*sr* = .35), a moderately strong predictor of Transfer Implementation Intentions (*sr* = .37), and a weak predictor of Commitment to Transfer Implementations (*sr* = .16). These results indicate that drivers who perceived the situational exercises as most realistic reported better training outcomes.

Table 3
Means, Standard Deviations, and Correlations between Posttraining Self Efficacy, Transfer Implementation Intentions, Commitment to Transfer Intentions and TEAQ Subscales (N = 16).

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1. Posttraining Self Efficacy	82.12	9.04	1.00								
2. Transfer Implementation Intentions	78.69	8.03	.62**	1.00							
3. Commitment to Transfer Intentions	68.92	11.84	.33	.79**	1.00						
4. Overlearning	52.98	16.37	.17	.01	.23	1.00					
5. Fidelity	54.52	16.80	.61*	.41	.41	.67**	1.00				
6. Stimulus Variability	73.96	14.94	.35	.37	.16	.60*	.59*	1.00			
7. Principles/Meaningfulness	80.94	9.03	.14	.02	-.04	.00	.11	-.02	1.00		
8. Feedback Cues	69.11	10.91	.43	.47	.33	.05	.16	.18	.45	1.00	
9. Relapse Prevention	60.85	16.58	.13	.31	.54*	.54*	.40	.32	.06	.26	1.00
10. Goal Setting	67.76	14.41	.43	.39	.54*	.30	.44	.13	.03	.39	.52*

Note. Scores on all scales could range from 0 to 100. * $p < .05$, ** $p < .01$.

Discussion

The initial objectives of the fatigue management program were to assist coach drivers to distinguish between effective and ineffective coping styles, to improve the drivers' confidence in using the effective coping strategies, and for the drivers to develop specific plans to implement effective coping strategies as part of their work. It was expected that the use of situational exercises would assist in achieving these outcomes in three ways: by enhancing the psychological fidelity of the content, by assisting the drivers to recognise general principles that could be applied across many situations, and by assisting the drivers to understand the conceptual framework and enhance their application of the training.

The first objective was completely achieved in that the majority of drivers favoured the Task focused and Reappraisal coping responses and were able to provide very similar effectiveness ratings to the driver supervisors.

The drivers reported high levels of Posttraining Self Efficacy and strong level of Transfer Implementations Intentions. However, their level of commitment to their Transfer Implementations Intentions was slightly lower and could reflect aspects of the transfer climate that existed in the organization. The drivers also reported very positive reactions to the training program. The unique contribution of each of the seven subscales of the TEAQ to the prediction of the three training outcomes was analysed and Fidelity was found to be a strong predictor of all three training outcomes (ignoring the actual level of significance and concentrating on the magnitude of the semi-partial correlation coefficient). This is encouraging as it confirms that those trainees who perceived that the situational exercises were similar to the situations they face in their jobs reported better training outcomes. One puzzling feature was the relatively low overall rating for Fidelity compared to the other subscales of the TEAQ.

While this paper looked at the impact of the situational exercises on the training outcomes, it is also important to consider the impact on the transfer outcomes, and address the extent to which the drivers were able to transfer their skills to their workplace after the training program. Machin (2001) also reported the results for a further follow up of the trainees nine months after the training was completed (see the web site listed in the references for further details).

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Acknowledgements

The author wishes to acknowledge the assistance of McCaffertys Express Coaches. This research was partially funded by the Australian Transport Safety Bureau under the 1999-2000 Road Safety Research Grants Scheme.