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# Polish Adaptation of the Driving and Riding Avoidance Scale

***Abstract*** *Driving anxiety is a relatively undervalued topic of research, despite the fact that it can have a substantial detrimental impact on an individuals' life. The prevalence of driving anxiety in motor vehicle crash (MVC) survivors has been found to range from 18–77%. Although driving anxiety can develop without crash involvement, no information currently exists on the prevalence of driving anxiety in the general population. One barrier to gathering this information is that most of the instruments are designed to measure driving anxiety in MVC survivors. However, the Driving and Riding Avoidance Scale (DRAS; Stewart & St. Peter, 2004) is one instrument that shows promise as a more general measure of driving anxiety, although previous research has noted the need for some minor adaptations (Taylor & Sullman, 2009). Therefore, the present study investigated the psychometric properties of an adapted version of the DRAS and the level of driving anxiety amongst a sample of 210 Polish participants. Internal consistency for the overall DRAS was .91 and ranged from .77 to .85 for the subscales. Factor analysis of the DRAS resulted in two clear factors, with the first containing driving avoidance items and the second consisting solely of riding avoidance items. Therefore it appears that the DRAS can be a useful measure of driving avoidance in samples drawn from the general population as well as MVC survivors.*

***Key words****: driving anxiety, the Driving and Riding Avoidance Scale, DRAS, anxiety, self-esteem, mood*

## Introduction

Over the last decade, there has been increasing interest in driving-related anxiety (e.g., Clapp, Olsen, Danoff-Burg, Hagewood, Hickling, & Beck, 2011; Taylor & Deane, 1999, 2000; Taylor, Deane, & Podd, 2002). One of the reasons for this increase may be the fact that driving anxiety has been found to be related to performance decrements in studies using self-report questionnaires, simulators and observational research (Kontogiannis, 2006; Matthews, Dorn, Hoyes, Davies, Glendon, & Taylor, 1998; Sullman & Taylor, 2010; Taylor, Deane, & Podd, 2007). For example, using a questionnaire, Kontogiannis (2006) found that Greek drivers who reported a higher dislike for driving also reported more frequent engagement in mistakes and lapses. Furthermore, in a driving simulator task, participants with a dislike of driving exhibited less control and made more errors than drivers low in this characteristic (Matthews et al., 1998). This relationship has also been confirmed using observational measures (Taylor et al., 2007). Taylor et al. (2007) found that driving fearful participants made more errors while driving than a control group of non-fearful drivers.

Research investigating the prevalence of driving anxiety has mostly focused on survivors of motor vehicle crashes (MVCs), and has found the level of driving phobia and phobic travel anxiety to range from 18–77%, although rates are higher in samples of referred patients (57–77%;

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Hickling & Blanchard, 1992; Horne, 1993; Kuch, Swinson, & Kirby, 1985) than those recruited consecutively following hospital admission (18–22%; Mayou, 1997; Mayou, Bryant, & Duthie, 1993; Mayou, Bryant, & Ehlers, 2001). However, research has shown that driving anxiety is not always preceded by crash involvement (Taylor, Deane, & Podd, 2002). Nonetheless, surprisingly little research has been conducted on non-clinical samples of drivers and that which does exist has shortcomings. For example, in a survey of 100 New Zealand drivers, Taylor and Paki (2008) found that 8% reported moderate to extreme driving anxiety. Furthermore, in a study of over 2,500 older drivers (55–70 years old), Taylor, Alpass, Stephens, and Towers (2011) found that 17–20% reported mild levels of driving anxiety, while 4–6% reported mild to severe driving anxiety. However, these studies tell us nothing about the levels of driving anxiety in the population as a whole.

As well as having a detrimental effect on an individuals' driving behaviour, driving anxiety has also been found to lead to avoidance behaviours (Blanchard & Hickling, 2004; Koch & Taylor, 1995; Taylor & Koch, 1995). According to Blanchard and Hickling (1997), avoidance behaviour may range from the occasional reluctance to drive or ride under particular conditions (e.g., darkness or heavy traffic) to a total avoidance of vehicular travel altogether. There are several questionnaires that have been developed to measure driving avoidance (e.g., Travel Phobia Questionnaire – Ehring, Ehlers, & Glucksman, 2007; Accident Fear Questionnaire – Kuch, Cox, & Direnfeld, 1995; Driving Situations Questionnaire – Ehlers, Hofmann, Herda, & Roth, 1994; the Fear of Driving Inventory – Walshe, Lewis, Kim, O'Sullivan, & Wiederhold, 2003), however, most of these measures were designed to assess driving anxiety or avoidance following an MVC. One measure of more general driving avoidance designed to be used with non-clinical samples is the Driving and Riding Avoidance Scale (DRAS – Stewart & St. Peter, 2004), which is a 20-item instrument assessing avoidance behaviour. As well as an overall avoidance score, the DRAS generates subscale scores for general avoidance, avoidance of dense traffic and busy roads, avoidance of bad weather or darkness, and riding avoidance. The DRAS has good psychometric properties, with an alpha coefficient of .92 for the overall scale and alphas ranging from .82 to .86 for the subscales. Furthermore, the scale has good test-retest reliability ($r$ = .82) (Stewart & St. Peter, 2004).

Surprisingly, the only study to use the DRAS in a non-clinical sample found a very high level of driving and riding avoidance among New Zealand university students (Taylor & Sullman, 2009). This study found the DRAS to have an overall alpha coefficient of .89, with the individual subscales ranging from .74 to .82. Three-month test-retest reliability was also acceptable at .71 and ranged from .62 to .74 for the subscales. However, Taylor and Sullman found that factor analysis only supported a three-factor solution, with the traffic and general avoidance factors being clear, while the riding and weather avoidance items loaded on the same factor. More concerning was the fact that their sample of New Zealand university students reported higher levels of driving and riding avoidance than those reported by US MVC survivors (Taylor & Sullman, 2009). The authors attributed this to the fact that much of the driving avoidance reported by the students was motivated by other factors, such as environmental or economic concerns, rather than by anxiety, due to the unclear instructions for completing the DRAS. With this in mind, the authors suggested a number of minor revisions to the DRAS in the form of wording alterations to make it clear to respondents that they are being asked to indicate how often they avoid particular situations due to driving anxiety rather than other issues.

Although there has been little research on driving behaviour in Poland (e.g. Grunt-Mejer & Grunt-Mejer, 2011; Przepiórka & Błachnio, in press; Wontorczyk, 2011), these have mainly focused on aggressive behaviour. The issue of driving anxiety has yet to be investigated. Therefore the aim of the present study was to adapt the DRAS into Polish in order to investigate the prevalence of driving and riding avoidance in Poland. Secondly, the present study investigated the psychometric properties of the revised DRAS, along with the relationships the DRAS and its subscales had with trait anxiety, mood regulation, self-esteem and a number of demographic and descriptive variables.

## Method

### Participants

Part-time students were approached in class and briefly informed about the study. Those who agreed to participate were asked to complete the questionnaire in class. The participants were all students studying marketing, management and economics. Participation was on a voluntarily basis and they received no course credit for taking part in the study. In total 210 participants (158 women, 52 men) completed the survey. The average age was 24.7 years ($SD$ = 5.7, range 18–51 years) and the majority of the students (95%) also worked part time. Participants had held their driver's licence for an average of 5.4 years ($SD$ = 4.9) and the average mileage over the last year was 13035 km ($SD$ = 17296). Most (91.0%) of the sample held a full driver's licence, while 4.2% had a restricted and 3.8% a learner's licence. Most participants drove a car (95%), with a small number reported driving a motorcycle (1.4%) or van (1%). In terms of the frequency of driving, 42.86% indicated that they drove every day, 29.52% reported driving several times a week, 12.38% drove once a week, 6.19% drove once a month, 6.29% drove once in a couple of months, and 2.86% reported never driving. The vast majority of the participants did not report any crashes within the last year, with only three people reporting having had a crash during this period of time. They were also asked to report

their perceived ability as a driver on a 5-point Likert scale, which ranged from 1 – very poor to 5 – excellent.

**Measures**

In addition to demographic and descriptive variables (i.e., age, gender, kilometres driven in the last year, status of current car driver's licence, licence tenure), the questionnaire included several other measures, as described below.

The *Driving and Riding Avoidance Scale* (DRAS) (Stewart & St. Peter, 2004) is a 20-item scale that measures the frequency of overt travel avoidance over the previous week. Avoidance of specific driving scenarios is rated on a 4-point Likert scale (0 = rarely to 3 = most of the time). Items are summed to provide a total score (range 0–60) with higher scores indicating a greater frequency of travel avoidance (e.g., "I put off a brief trip or errand that required driving the car", "I avoided driving on busy city streets"). There are also subscales for general, traffic, riding, and weather avoidance. The original scale showed good test-retest reliability after three months. The alpha coefficients ranged from .62 to .74 for the individual subscales, and .71 for the total DRAS.

The DRAS was translated from English to Polish and back-translated to ensure no mistakes were introduced. Firstly the questionnaire was translated into Polish by the authors of the article and then back translation was performed by a professional English translator who also proofread the final version. The list of items was gathered and assessed in terms of language and grammatical correctness. No ambiguous or problematic items were identified. Furthermore, as noted earlier, the instructions for the DRAS were modified to ensure that respondents were rating avoidance due to driving anxiety.

The Polish adaptation (Łaguna, Lachowicz-Tabaczek, & Dzwonkowska, 2007) of *Rosenberg's Self-Esteem Scale* is a scale that measures the overall level of self-esteem as a positive or negative attitude towards self. It consists of 10 items which are answered on a four-point Likert scale (1 = strongly agree to 4 = strongly disagree). Internal consistency for the scale in the current sample produced a Cronbach's alpha of .85.

The *Mood Regulation Scale* (Wojciszke, 2003) consists of two subscales: Mood Improvement Scale (MIS) and Mood Deterioration Scale (MDS). Both subscales are characterised by satisfactory reliability and theoretical validity. Improvement and Deterioration of mood are independent responses, and do not form a continuum. Each scale consists of 15 items and the participant indicates the frequency with which they think or behave in the manner described using a five-point Likert scale (1 = never to 5 = always). In the present study the alpha coefficients for the MIS and MDS were .83 and .92, respectively.

The Polish adaptation (Wrześniewski, Sosnowski, & Matusik, 2002) of the *State-Trait Anxiety Inventory* (STAI) (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) was also used to measure trait anxiety. The STAI is widely used in research and clinical practice and has well-documented psychometric properties. The 20-item trait scale of the STAI (i.e., STAI-T) was used in the present study to measure trait anxiety. Respondents were asked to describe the way they feel on a scale from 0 (*not at all)* to 4 (*very much)*. The total STAI-T score ranges from 20 to 80 and in the current study had an alpha coefficient of .81.

**Results**

The DRAS and its subscales in the presented study had good internal consistency. The Cronbach's alpha coefficient for the total score was .91, .81 for general avoidance, .85 for traffic avoidance, .77 for weather/darkness avoidance, and .80 for riding avoidance.

Table 1 presents the descriptive data for the DRAS items, and all items had relatively low mean ratings compared to Taylor and Sullman's (2009) student sample. The item-total correlations ranged from .21 to .79.

Table 2 shows the total and subscale scores obtained by Stewart and St. Peter (2004) and Taylor and Sullman (2009). Five one-sample t-tests were used to compare the present results with those of Stewart and St. Peter and Taylor and Sullman. There were no significant differences between the present group of Polish students and the group of American university students who had been involved in an MVC. However, some differences were found in almost all subscales between Poland and New Zealand.

Unlike the New Zealand student sample (Taylor & Sullman, 2009) and the American MVC survivors (Stewart & St. Peter, 2004), the present study found gender differences on the DRAS. In comparison with Polish men, Polish women reported significantly higher scores for the total avoidance subscale ($F(1,199) = 6.60$, $p < .05$), the general avoidance subscale ($F(1,199) = 8.95$, $p < .01$) as well as for the traffic avoidance subscale ($F(1,199) = 6.37$, $p < .05$).

One-sample t-tests, which were used to compare the results separately for men and women across the three groups (Poland, New Zealand and the US), found there were several differences (Table 3). Firstly, Polish men reported significantly lower total DRAS scores than men in the US and New Zealand, while Polish women also reported lower total DRAS scores than New Zealand women. For the general avoidance and traffic avoidance subscales, both Polish women and men scored significantly lower than their New Zealand counterparts. Conversely, New Zealand men reported significantly less avoidance of driving due to weather or darkness than Polish men.

Table 4 presents the correlations of the DRAS and its subscales as well as the validity measures. There was a relatively high correlation between the total score and the subscales, except for riding avoidance which was of more moderate strength (.63). The correlations between the subscales were also strong, again except for the associations

Table 1. *DRAS item mean scores and item-total correlations*

| Item | | Mean | *SD* | Item-total correlations |
|---|---|---|---|---|
| 1. | I put off a brief trip or errand that required driving the car | .30 | .69 | .54 |
| 2. | I chose to walk or ride a bicycle someplace to avoid driving in the car | .42 | .79 | .59 |
| 3. | I avoided driving a car if I could | .50 | .88 | .66 |
| 4. | I avoided riding in a car if I could | .37 | .76 | .21 |
| 5. | I avoided driving on residential streets | .23 | .66 | .62 |
| 6. | I avoided driving on busy city streets | .36 | .75 | .68 |
| 7. | I avoided driving on the motorway | .51 | .98 | .72 |
| 8. | I avoided driving through busy intersections | .48 | .85 | .79 |
| 9. | I travelled a longer distance to avoid driving through heavy traffic or busy streets | .63 | .93 | .71 |
| 10. | I rescheduled making a drive in the car to avoid traffic | .59 | .92 | .67 |
| 11. | I avoided driving the car because the weather was bad (e.g., fog, rain, or ice) | .65 | .88 | .74 |
| 12. | I avoided driving the car after dark | .36 | .75 | .63 |
| 13. | I avoided riding in a car because the weather was bad (e.g. fog, rain, or ice) | .28 | .68 | .59 |
| 14. | I avoided riding in a car after dark | .19 | .59 | .55 |
| 15. | I avoided riding in a car if I knew the traffic was heavy | .21 | .59 | .56 |
| 16. | I avoided riding in a car on motorway | .23 | .67 | .59 |
| 17. | I rescheduled making a drive in the car to avoid bad weather (e.g. fog, rain, or ice) | .41 | .77 | .73 |
| 18. | I put off a brief trip or errand that required riding in a car | .22 | .62 | .59 |
| 19. | I chose to ride a bus someplace to avoid driving in the car | .42 | .79 | .59 |
| 20. | I avoided activities that required using a car | .24 | .55 | .71 |

*Note*. Item range 0-3 (higher scores indicate more frequent avoidance).

Table 2. *DRAS total and subscale scores for the present sample compared with Stewart & St. Peter's US (2004) data and Taylor & Sullman's New Zealand (2009) data*

| Scale | PL data $N = 210$ | US data $N = 386$ | New Zealand data $N = 307$ |
|---|---|---|---|
| Total DRAS score | 7.43 (9.31) | 7.64 (8.88) | 13.49 (10.38)*** |
| General avoidance | 2.32 (3.41) | 2.91 (3.78) | 5.96 (4.75)*** |
| Avoidance of traffic | 2.89 (4.02) | 3.24 (3.88) | 5.50 (4.61)*** |
| Avoidance of weather or darkness | 1.86 (2.65) | 1.85 (2.87) | 1.64 (2.75) |
| Avoidance of riding | 1.25 (2.44) | 1.15 (2.33) | 1.67 (2.46)* |

*Note*. Total score range 0-60. Subscale score range 0-21 (general and traffic avoidance). 0-15 (weather and riding avoidance).
*Comparison with the present study's total sample, $p < .001$.

Table 3. *DRAS total and subscale scores for the gender differences in the present sample compared with Stewart & St. Peter's US (2004) data and Taylor & Sullman's New Zealand (2009) data*

| Scale | Women PL | Men PL | Women US | Men US | Women New Zealand | Men New Zealand |
|---|---|---|---|---|---|---|
| Total DRAS score | 8.38 (9.99) | 4.60 (6.28) | 7.07(8.13) | 7.54(9.55)* | 13.33 (10.94)*** | 13.71 (9.57)*** |
| General avoidance | 2.74 (3.73) | 1.10 (1.75) | - | - | 5.87 (4.85)*** | 6.09 (4.62)*** |
| Avoidance of traffic | 3.32 (4.44) | 1.67 (2.50) | - | - | 5.46 (4.82)*** | 5.54 (4.30)*** |
| Avoidance of weather or darkness | 2.07 (2.75) | 2.50 (2.22) | - | - | 1.71 (2.86) | 1.54 (2.60)* |
| Avoidance of riding | 1.27 (2.35) | 1.18 (2.71) | - | - | 1.55 (2.56) | 1.84 (2.31) |

*$p < .05$; **$p < .01$; ***$p < .001$

Table 4. *Correlations between the DRAS and its subscales as well as validity measures*

| Scale | Total DRAS score | General avoidance | Traffic avoidance | Weather avoidance | Riding avoidance |
|---|---|---|---|---|---|
| Total DRAS score | - | .90*** | .92*** | .89*** | .63*** |
| General avoidance | - | - | .76*** | .80*** | .47*** |
| Traffic avoidance | - | - | - | .73*** | .44*** |
| Weather avoidance | - | - | - | - | .68*** |
| STAI-T | .36*** | .37*** | .28*** | .36*** | .14 |
| Self-esteem | -.33*** | -.32*** | -.29*** | -.32*** | -.15 |
| Mood Improvement Scale | .07 | .13 | .00 | .12 | -.02 |
| Mood Deterioration Scale | .35*** | .37*** | .34*** | .28** | .06 |
| Years held driver's licence | -.14 | -.15 | -.14 | -.09 | -.09 |
| Km travelled per year | -.20* | -.18* | -.22** | -.15 | -.02 |

*$p < .05$; **$p < .01$; ***$p < .001$

Table 5. *DRAS factor structure*

| Item | | Pattern coefficients | | Structure coefficients | | Communalities |
|---|---|---|---|---|---|---|
| | | Factor 1 | Factor 2 | Factor 1 | Factor 2 | |
| 13. | I avoided riding in a car because the weather was bad (e.g., fog, rain, or ice) | .13 | **.75** | **.38** | **.80** | .65 |
| 17. | I rescheduled making a drive in the car to avoid bad weather (e.g., fog, rain, or ice) | **.66** | .20 | **.73** | **.41** | .56 |
| 15. | I avoided riding in a car if I knew the traffic was heavy | .01 | **.92** | **.32** | **.93** | .86 |
| 16. | I avoided riding in a car on motorway | .16 | **.73** | **.41** | **.79** | .64 |
| 11. | I avoided driving the car because the weather was bad (e.g., fog, rain, or ice) | **.77** | -.01 | **.77** | .25 | .59 |
| 12. | I avoided driving the car after dark | **.59** | .12 | **.63** | **.32** | .41 |
| 18. | I put off a brief trip or errand that required riding in a car | .17 | **.74** | **.42** | **.79** | .66 |
| 14. | I avoided riding in a car after dark | -.01 | **.93** | **.30** | **.92** | .85 |
| 3. | I avoided driving a car if I could | .59 | .15 | **.64** | **.35** | .44 |
| 2. | I chose to walk or ride a bicycle someplace to avoid driving in the car | **.62** | -.01 | **.62** | .20 | .38 |
| 19. | I chose to ride a bus someplace to avoid driving in the car | **.64** | -.02 | **.63** | .20 | .40 |
| 1. | I put off a brief trip or errand that required driving the car | **.54** | .03 | **.55** | .21 | .31 |
| 20. | I avoided activities that required using a car | **.69** | .12 | **.73** | **.35** | .55 |
| 4. | I avoided riding in a car if I could | -.09 | **.37** | .03 | **.34** | .12 |
| 8. | I avoided driving through busy intersections | **.84** | -.01 | **.84** | .28 | .70 |
| 6. | I avoided driving on busy city streets | **.83** | -.15 | **.77** | .12 | .62 |
| 9. | I travelled a longer distance to avoid driving through heavy traffic or busy streets | **.74** | -.02 | **.73** | .22 | .53 |
| 10. | I rescheduled making a drive in the car to avoid traf c | **.71** | -.03 | **.70** | .20 | .48 |
| 7. | I avoided driving on the motorway | **.71** | .06 | **.73** | **.30** | .54 |
| 5. | I avoided driving on residential streets | **.77** | -.16 | **.72** | .10 | .54 |

with riding avoidance, particularly with general avoidance (.47) and traffic avoidance (.44).

Trait anxiety was positively correlated with the DRAS total and all subscale scores, except the riding avoidance subscale. Higher trait anxiety was associated with higher DRAS scores, other than riding avoidance which was not significant. The DRAS total and all subscales, again except for riding avoidance, were also significantly correlated with both self-esteem and mood deterioration, indicating that those lower in self-esteem and higher in mood deterioration were more likely to report avoidance behaviours.

Annual mileage was also significantly related to the total DRAS score, as well as the general avoidance and traffic avoidance subscales. Surprisingly, licence tenure and improvement mood were not related to total DRAS score or any of the subscales.

The factor structure of the DRAS scale was examined using Exploratory Factor Analysis, rather than Confirmatory Factor Analysis, due to the fact that both previous studies produced different factor structures. Table 5 presents the factor structure of the DRAS computed using Principal Component Analysis (PCA) with oblimin rotations (see Taylor & Sullman, 2009). The suitability of the data for PCA was established with a Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) of .87 (Kaiser, 1970, 1974) and a significant Bartlett's Test of Sphericity (Bartlett, 1954).

PCA indicated the presence of three factors with eigenvalues greater than 1, which was also supported by the scree plot. However, as only one item loaded solely on the third factor and parallel analysis suggested a two-factor solution, only two factors were retained. This resulted in a two-factor solution which explained 54.2% of the variance, with the two components correlated at .337. Factor 1,*Driving Avoidance,* explained 40.55% of the variance and had an alpha coefficient of .92. Factor 2, *Riding Avoidance,* explained 13.67% of the variance and the Cronbach's alpha was .84. The pattern matrix was reasonably clear, with no cross loadings above .20.

Pearson's correlation coefficients were calculated to investigate the relationships the two DRAS factors had with the other continuous variables (Table 6). The Driving Avoidance factor was negatively correlated with licence tenure, frequency of driving, annual mileage, self-reported driving skill and self-esteem. Driving Avoidance was also positively correlated with the STAI and the Mood Deterioration scale. In contrast, the Riding Avoidance factor was only significantly correlated with the Driving Avoidance factor.

Table 6. *Correlations between the Polish DRAS factors and the other continuous variables*

| | Driving avoidance | Riding avoidance |
|---|---|---|
| Driving avoidance | - | .45*** |
| Age | -.06 | -.08 |
| Years held driver's licence | -.17* | -.07 |
| Frequency of driving | -.48*** | -.10 |
| Km travelled per year | -.24** | -.02 |
| Skills of driving | -.47*** | -.14 |
| STAI | .35*** | .10 |
| Self-esteem | -.31*** | -.07 |
| Mood Improvement Scale | .05 | .06 |
| Mood Deterioration Scale | .36*** | .06 |

*$p < .05$; **$p < .01$; ***$p < .001$

## Discussion

The present study investigated the psychometric properties of the DRAS in a sample of Polish participants. In contrast to previous work (Stewart & St. Peter, 2004; Taylor & Sullman, 2009), the present study found gender differences, with women reporting higher DRAS totals, general avoidance, and traffic avoidance scores. The contrast with the previous research could be due to the fact that New Zealand and America share more cultural similarities than Poland has with either. The higher avoidance scores among women may result from the role that women play in Polish society. Although this tendency is changing, in Poland most of the driving is still undertaken by men. Furthermore, the stereotype that women are worse drivers than men may still exist and probably also has an influence on higher driving anxiety among Polish women.

There were also similarities between the present study and that of the previous research using the DRAS. The overall DRAS scale had good internal consistency at .91, which was similar to that found in America (.89) and New Zealand (.92). Furthermore, using the original DRAS factor structure, the internal reliabilities for the subscales ranged from .77–.85, which was very similar to both the American (.82–.86) and New Zealand studies (.74–.82).

Interestingly the DRAS scores reported here were not significantly different from those reported in a clinical sample of American MVC survivors (Stewart and St. Peter, 2004), but mostly appeared to be lower than those reported by New Zealand university students. However, as mentioned earlier, the New Zealand students were probably reporting very high driving avoidance due to reasons other than anxiety, as the instructions were unclear. As this is the first study to use the modified DRAS with instructions to make it completely clear that the avoidance was due to

anxiety, it would appear that driving and riding avoidance are as high in a non-clinical sample as in a sample of MVC survivors. However, as mentioned earlier, it is possible that driving avoidance is higher in Poland anyway, or access to cars is more difficult than in America or New Zealand. According to the Economist, New Zealand has the highest car ownership in the world, with 619 cars for every 1000 inhabitants and America has 468 cars/1000, meaning they are both very car-dependent countries. Poland has only 291 cars/1000 people, which is less than half the number in New Zealand (Economist, 2007). Another possible explanation for the avoidance behaviour in Poland may be due to the high number of crashes and unsafe road conditions. According to government statistics on road safety, the percentage of road accidents in Poland is still amongst the highest in Europe (Raport, 2010). This is reinforced by the media, with announcements almost every day about fatal road crashes caused either by poor road conditions or careless driving behaviour.

Factor analysis of the DRAS data produced a relatively clear two-factor solution, with no cross loadings. Factor 2 consisted only of items to do with riding avoidance, which is similar to the riding avoidance factors found by Stewart and St. Peter (2004) and Taylor and Sullman (2009). However, the riding avoidance factor found here was much clearer than those found by previous studies, in that there were no cross loadings or misplaced items. In both previous studies, there were one (Taylor & Sullman, 2009) or two (Stewart & St. Peter, 2004) riding items that loaded on a different factor. However, in the present study surprisingly all riding items loaded on Factor 1. This is in contrast to the original study which found four factors and the New Zealand study which found three. It is hard to compare the three studies, as the American study was conducted with MVC survivors, the New Zealand study with a non-clinical sample of University students and the present study with a sample of non-clinical Polish students. In addition, the sample sizes varied widely, with the American study using 386, the New Zealand study 307 and the present study 210. Furthermore, as these three populations differ in a number of respects, it is hard to know the reason for the different factor structure. However, irrespective of the cause of the different factor structure, future research is needed to more completely understand the latent variables underlying the DRAS.

The validity of the translated scale and the reliability of its items were confirmed by the correlations found between variables. In the present study, a positive correlation was found between the avoidance of driving and the level of anxiety measured using the STAI scale. It appears that a generally fearful attitude can be a factor that translates itself into a fear of driving. Moreover, a correlation was found between avoidance on the road and self-esteem, which agrees with the results of previous studies (Łaguna & Bąk, 2007; Łaguna, Lachowicz-Tabaczek, & Dzwonkowska, 2007; Kolańczyk, 2010). A correlation was also found between driving avoidance and mood lowering, which agrees with the study carried out by Wojciszke (2003), who found correlations of mood lowering with variables such as anxiety and sadness, as well as depression and neuroticism. Based on this study, it is possible to draw up a profile of individuals who avoid driving a car. They are people with: low self-esteem, tend to be high in anxiety and have a tendency towards mood lowering. It is interesting that riding avoidance did not correlate with any of the other variables, including: general anxiety, mood regulation or self-esteem. The reason may lay in the ambiguity of the phrase "riding in a car", which could be interpreted to mean riding in a car as a driver or a passenger. In our translation of the DRAS we added the expression "as a passenger" to avoid this linguistic ambiguity.

Regarding the demographic variables, the Driving Avoidance factor correlated negatively with: licence tenure, frequency of driving, annual mileage and the self-assessment of driving skills. Those drivers who are not experienced in driving and who do not drive a lot were more anxious behind the wheel. The lack of experience by time and kilometres may reduce the sense of security and increase the level of anxiety. Whenever these individuals have a chance to avoid driving, they will repeat this pattern of behaviour. However, the results of the current study indicate that the Riding Avoidance Scale measures a different phenomenon that is not dependent on the demographic or psychological variables considered in the present study.

The present study has a number of limitations. Firstly, the current sample was comprised of more females and young adults than the general population of Poland. Future research should be undertaken using a more representative sample of the population. Secondly, future research should also be undertaken to investigate other factors that are associated with avoidance behaviours. Specifically, more effort should be made to consider the multidimensional character of this phenomenon in order to try and determine more specific factors related to this type of anxiety. For example, the avoidance behaviour may be due to some physical deficit or could be related to organic diseases. It may also be due to a deficit in motor coordination or lateral dysfunction. Furthermore, the avoidance behaviour could be as a result of experiencing a motor vehicle crash (MVC) which occurred outside the period measured in the present study (i.e. longer than one year ago).

The findings of the present study also suggest that investigating emotion-related variables could help in understanding this behaviour. Therefore, the inclusion of emotional intelligence, particularly the emotional control aspect, would appear to be a fruitful avenue to pursue in future research. Furthermore, the negative association between driving anxiety and mood deterioration found here suggests that perhaps training focused on improving negative mood may be beneficial for lowering avoidant behaviour.

In conclusion, the present study provides further support for the use of the DRAS as a measure of driving avoidance that is due to driving anxiety, and the use of the revised instructions to ensure that this is what the scale measures. Population-based research on driving anxiety is needed, not only in Poland, to establish the prevalence of driving anxiety as well as its characteristics, and the DRAS would be a useful measure of avoidance behaviour for such research.

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