Serrano-Fernández, M.J., Tàpia-Caballero, P., Boada-Grau, J. y Araya-Castillo, L. (2020). Variables that predict Attitudes Toward Safety Regulations in professional drivers. *Journal of transport & Health, 19,* 100967. https://doi.org/10.1016/j.jth.2020.100967

Title

Variables that predict Attitudes Toward Safety Regulations in professional drivers.

Abstract

Background: Several authors have analyzed how certain driver characteristics can lead drivers to disobey traffic regulations and commit traffic violations. However, professional drivers should have a proper attitude towards traffic regulations in order to avoid penalties and prevent collisions. In this paper we use the following indicators to develop a model for predicting the attitudes of professional drivers towards safety regulations: Personality, Job diagnostic survey, Job content questionnaire, Burnout, Driver Fatigue and Fatigue. **Method:** Participants were 511 professional drivers from various transport sectors recruited in Spain through non-probability sampling. We used Pearson's correlation coefficients to calculate the correlations between the predictor variables and the criterion variables and performed multiple regressions using SPSS 25 and the step-by-step option. **Results:** Our results show significant correlations between the study variables. Regression analysis shows that certain variables have predictive power over the factors studied in relation to the Attitudes Toward Safety Regulations scale (ATSR). **Conclusions:** Attitudes towards safety regulations can be predicted through certain variables. Professional efficiency (22.7%) and Emotional stability (22.3%) are the best predictors since they explain a greater degree of variance. This study will enable us to better understand which factors help to improve attitudes towards Safety Regulations and therefore to reduce penalties and road collisions.

Keywords: Professionals Drivers; Road Safety, Attitudes Toward Safety Regulations

Variables that predict Attitudes Toward Safety Regulations in professional drivers

1. Introduction

Safety at the wheel is included in regulations all drivers must follow, which in Spain and Europe are the General Traffic Regulations (European Union, 2020). Drivers' attitudes towards safety regulations can directly impact how drivers comply with traffic regulations. These attitudes have been studied in groups of drivers such as truck drivers (Douglas & Swartz, 2009, 2017; Poulter et al., 2008) and taxi drivers (Delgado, 2013; Shi et al., 2014).

Not wearing a seat belt, using a cell phone, and not driving at the correct speed for the road are problems where drivers may perceive safety regulations to be unrealistic or unreasonable. This can influence their decision-making and behavior related to safety (Douglas & Swartz, 2009). Safety regulations exist to prevent damage to drivers and pedestrians. It is important, therefore, to detect factors that may influence the observance of these regulations. To do so we developed a predictive model for attitudes towards safety standards in professional drivers using several indicators that have been used in isolation in other studies. In this paper, therefore, we analyze whether personality, burnout, fatigue and the characteristics of the job itself influence a driver's perception of the regulations and their compliance with them.

In the following sections we explain our reasons, based on previous research, for including several variables in the conceptual framework.

1.1. Personality characteristics in professional drivers

Landay, Wood, Harms, Ferrell and Nambisan (2020) studied the personality characteristics of truck drivers and their involvement in traffic collisions. They found that people who are more empathetic had lower collision involvement rates, while those who are more anxious or risk-taking had higher rates. It has also been found that in professional

drivers predicts conscientiousness relationship in a positive way hazard prevention and agreeableness negatively predicts sensation seeking professional drivers (Serrano-Fernández et al., 2019). Drivers with high scores in experience and extraversion may be more sensitive to road monotony, which makes them more prone to fatigue-related driving errors in undemanding road environments (Thiffault & Bergeron, 2003). Ulleberg and Rundmo (2003) assert that personality influences risky driving behavior indirectly by affecting attitudinal determinants of behavior. Greater aggressiveness has been associated with more reckless behavioral intention (Ruiz-Pérez et al., 2014). Those with certain personality characteristics therefore have better attitudes towards traffic safety and tend to drive with less risk.

1.2. Burnout in professional drivers

Maslach and Jackson (1981) asserted that burnout is an inadequate response to chronic emotional stress, the main features of which are emotional exhaustion, a cynical attitude, and a feeling of ineffectiveness in the face of the tasks one has to perform. In the context of traffic, this syndrome has been associated with driver behavior patterns (Salazar & Pereda, 2010). Chávez and Merino (2014) asserted that in bus drivers the dimensions of burnout syndrome (emotional exhaustion, efficiency and cynicism) are not related to reckless behaviors (such as talking on a cell phone, driving through a red light, or picking up/dropping off passengers in the middle of the road) or a driver's history of violations. Olivares et al. (2013) suggest that Burnout correlates with the driver's mental load, especially when it comes to cynicism, which may be related to cognitive area and manifests itself in self-criticism and personal devaluation, leading drivers to distrust and despise their work (Maslach et al., 1996).

1.3. Fatigue and driver fatigue in professional drivers

Taylor and Dorn (2006) related stress and fatigue to the risk of collisions in bus drivers. Moreover, long hours of driving, as well as being responsible for passenger safety, have been shown to cause stress (Greiner et al., 1998). Working long hours and suffering from excessive daytime sleepiness with constant risky driving therefore leads to a greater risk of collisions (Kwon et al., 2019) and to those collisions being more serious than those suffered by non-professional drivers (Braeckman et al., 2011; Philip, 2006). In this context, it has been found that professional drivers suffer from a high rate of stress and exhaustion, stress associated with exhaustion and traffic collisions (Useche, Cendales, et al., 2017). It has also been found that work pressure, lower rewards, and low peer support can lead to mental health problems in drivers (Gómez-Ortiz et al., 2018). Finally, we must also take into account risky behaviors when driving too fast in order to arrive on time or when loading/unloading passengers (Santos & Lu, 2016).

1.4. The role of work conditions in professional drivers

Fatigue and the need to recover mediate between social support and risky driving (Useche, Ortiz, et al., 2017). Job content therefore becomes important when predicting driver behavior. Some authors have reported significant effects between individual and daily emotional demands and self-reported shocks mainly on acute fatigue and safety motivation (Husain et al., 2019).

Serrano-Fernández et al. (2019) showed that in professional drivers the characteristics of the job, measured via the Job diagnostic survey, influence their performance. They found, for example, that *task identity* positively predicts relaxed driving and hazard prevention, that *feedback from job* negatively predicts fatigue and anxiety, and that *feedback from agents* negatively predicts alertness and vigilance.

1.5. General aim and hypothesis

The main aim of this study is to develop a predictive model for the Attitudes Toward Safety Regulations in professional drivers using the following indicators: Personality, Burnout, Fatigue and Work conditions (see Fig 1). We therefore propose the following hypothesis:

Hypothesis 1: If Attitudes Toward Safety Regulations are influenced by personality, burnout, fatigue or job characteristics, then a good prediction can be made by a model that incorporates these predictors.

2. Method

2.1. Participants

Participants in this study were 511 professional drivers (8.4 % women and 90.6 % men) with an average age of 42.1 (*SD*= 13.21). The marital status of the participants were as follows: married or in a partnership (71.2 %), single (19.7 %), separated or divorced (7.4 %), and widowed (1.7 %). Their education level was as follows: university studies (3.2 %), lower secondary school, professional training-II or prep school (23.1%), upper secondary school, professional training-I or compulsory secondary education (53.2%), and unfinished primary education (20.5 %). The types of transportation these drivers were engaged in were as follows: freight transportation: 42.1 %, passenger transportation 25.3 %, taxi drivers 12.8 %, ambulance/healthcare drivers 9.3 %, machinery transportation 5.3 %, and others 5.2 %. The drivers' average years' experience was 10.92 (*SD*=11.78). Average weekly working hours were 45.23 (*SD* = 17.59). Of these drivers, 14.2% drive internationally (to Europe), 26.4% drive around Spain, 26.8% drive across their region, and 32.5% drive across their province. The average number of direct supervisors the drivers have is 1.72 (*SD* = 3.93) and the average number of peers with whom they interact is 9.67 (SD = 26.3).

2.2. Instruments

To measure driving attitudes, we used the Spanish version (Serrano-Fernández et al., n.d.) of the *Attitudes Toward Safety Regulations Scale* (ATSRS; Douglas & Swartz, 2009). This version consists of 13 items and measures three dimensions of driver attitudes towards safety regulations: F1.ENF. *Effectiveness of Enforcement* (5 items; α=.84; e.g. "2. Safety authorities get dangerous drivers off the road"). F2.ATT. *General Regulatory Attitudes* (4 items; α=.89; e.g. "9. Safety regulations in general have become too strict in recent years"). F3.EFF. *Regulatory Effectiveness* (4 items; α=.78; e.g. 12. Regulations for driver health standards improve highway safety". The items on this scale are answered using a 7-point Likert scale ranging from 1 = Totally disagree to 7 = Totally agree.

The Overall Personality Assessment Scale (OPERAS; Vigil-Colet et al., 2013) is based on the Big Five personality traits model, which consists of 40 items and is answered using a 5-point Likert scale ranging from 1 = totally disagree to 5 = totally agree. The five dimensions are: "F1. Extraversion" (α = .86; e.g. "8. I perform well in social situations"), "F2. Emotional Stability" (α = .86; e.g. "32. I change my mood often"), "F3. Conscientiousness" (α=.77; e.g. "28. I am a perfectionist"), "F4. Agreeableness" (α=.71; e.g. "23. I am very critical of others"), and "F5. Openness to Experience" (α=.81: e.g. "35. I am curious about the world around me").

The Job Diagnostic Survey (JDS-21; Hackman & Oldham, 1974, 1975) evaluates the characteristics of the work that influence results. In this paper we have used the Spanish language version (González, 1997). The questionnaire consists of 7 subscales, each of which has 3 items. The dimensions are: "F1. Skill variety" (α=.78; e.g. "5. The work is quite simple and repetitive"), "F2. Task identity" (α=.78; e.g. "11. The work allows me to completely finish the tasks I undertake"), "F3. Significance" (α=.71; e.g. "14. The work itself is not very significant or important in the general context"), "F4. Autonomy" (α=.73; e.g. "13. I have

enough independence and freedom to decide how to do my job", "F5. Feedback" (α=.70; e.g. "12. The work itself provides me with very few indications about my performance"), "F6. Feedback from agents" (α=.70; e.g. "10. My superiors often let me know what they think about my performance at work") and "F7. Dealing with others in their jobs" (α=.72; e.g. "2. The work requires a lot of cooperation with other people"). The response format is a 7-point Likert scale ranging from 1 = Very little to 7 = A lot.

The Job Content Questionnaire (JCQ-25; Karasek & Theorell, 1990) analyzes work situations in which stressors are chronic, paying special attention to the psychosocial characteristics of the work environment. For this paper we have used the Spanish version (Escribà-Agüir et al., 2001), which consists of 28 items divided into 3 dimensions: "F1. Job Demands" assesses amount of work, intellectual demands and pressure of working time (9 items; α=.74; e.g. "19. My work requires a lot of hard work"; "F2. Job Control" assesses the possibility of making decisions creatively and applying and developing one's own abilities (9 items; α=.74; e.g. "3. My work requires me to be creative"; and "F3. Support" assesses the support received from colleagues and superiors (11 items; α=.87; e.g. "41. The people I work with are interested in me"). The response format is a four-point Likert scale ranging from 0 = Strongly disagree to 3 = Strongly agree.

The Burnout Scale (MBI-GS; Salanova et al., 2000) evaluates burnout and consists of 15 items divided into 3 subscales: "F1. Exhaustion" (5 items; α = .87; e.g. "6. I feel 'burned out' by work"); "F2. Cynicism" (4 items; α = .85; e.g. "9. I have lost enthusiasm for my work") and "F3. Professional efficiency" (6 items; α = .78; e.g. "12. I have achieved a lot of worthwhile things in this position"). The response format is a 7-point Likert scale ranging from 0 = Never to 6 = Always/Every day.

We also used the Swedish Occupational Fatigue Inventory (SOFI) (Åhsberg et al., 1997), which assesses multidimensional work-related fatigue. For this paper we used the

Spanish version (González-Gutiérrez et al., 2005), which comprises 5 subscales, each of which contains 3 items: F1. Lack of energy (α = .92; e.g. "2. Exhausted (for example, being worn out"); F2. Physical exertion (α = .87; e.g. "9. With heat (for example, sweating)"; F3. Physical discomfort (α = 0.81; e.g. "14. Painful (for example, feeling pain or grief); "F4. Lack of motivation, i.e. feeling uninvolved or unexcited (α = .92; e.g. "5. Apathetic (for example, feeling abandoned)"; and F5. Sleepiness, i.e. feeling drowsy (α = .89; e.g. "11. yawning (for example, opening one's mouth slowly). The response format is a Likert scale ranging from 0 = not at all to 10 = to a high degree.

To measure Driver Fatigue we used the Driver Fatigue (DF-8) developed by Tàpia-Caballero, Serrano-Fernández, Boada-Grau, et al. (n.d.). This 8-item unifactorial scale assesses fatigue in professional drivers (α = .88; e.g. "5. I feel tired as soon as I start my working day on the bus, truck, combi, van, taxi, etc."). The response format is a five-point Likert scale ranging from 1 = never to 5 = always.

2.3. Procedure

We used non-probability sampling (Hernández et al., 2004), also known as accidental-random sampling (Kerlinger & Lee, 2004), to obtain the sample. The response rate was approximately 80%. The participants answered voluntarily and did not receive any form of gratification. Confidentiality of the data provided by participants is fully guaranteed.

2.4. Data Analysis

First, we used Pearson's correlation coefficients to calculate the correlations between the predictor variables and the criterion variables. We then performed multiple regressions using IBM SPSS Statistics 25 software following the stepwise option (Hinton et al., 2014). With this method, the variables are incorporated into the regression model. There were

twenty-four variables corresponding to Personality, Job diagnostic survey, Job content questionnaire, Burnout, Fatigue and Driver fatigue. The first step was to select the variables which satisfied the entry criteria and correlated best with the criterion variable (Enforcement, General attitudes and Effectiveness). We then used the partial correlation coefficient as a selection criterion. The variables were selected one by one provided they met the entry criteria and possessed the partial correlation coefficient with the highest absolute value. Whenever a new variable was incorporated into the model, the previously selected predictive variables were again evaluated to determine whether they satisfied the exit criteria. If any selected variable did not satisfy the exit criteria, it was ejected from the model. This process ended when the variables that satisfied the input criteria and those that satisfied the output criteria were finished. The aim of this procedure is to explain the maximum variance with the minimum number of predictive variables.

3. Results

3.1. Reliability analysis of the instruments used

Table 1 shows the instruments used. The indices for internal consistency are appropriate since they range from .70 (Dealing) to .89 (General attitudes).

INSERT TABLE 1 HERE

3.2. Correlation between the study variables

Table 2 shows the correlational study, with correlations between the criterion variables and the predictor variables. We found positive correlations between the criterion variables (Enforcement, General attitudes and Effectiveness) and the following twenty-four predictor variables: Extraversion (OP.EX), Emotional Stability (OP.EE), Conscientiousness (OP.CO), Agreeableness (OP.Ag), Openness to experience (OP.OE), Variety (JDS.1),

Identity (JDS.2), Significance (JDS.3), Autonomy (JDS.4), Feedback (JDS.5), Agents (JDS.6), Dealing (JDS.7), Social Support (JCQ.SS), Job Demand (JCQ-JD), Job Control (JCQ.JC), Exhaustion (MBI.E), Cynicism (MBI.C), Professional efficiency (MBI.PE), Driver Fatigue (DF-8), Lack of energy (SOFI.LE), Physical exertion (SOFI.PE), Physical discomfort (SOFI.PD), Lack of motivation (SOFI.LM), and Sleepiness (SOFI.S). *Enforcement* (ATRS.ENF) correlated positively with eleven variables and negatively with four. On the other hand, *General attitudes* (ATRS.ATT) correlated positively with fourteen variables and negatively with *Openness to Experience*. *Effectiveness* (ATRS.EFF) correlated positively with ten variables and negatively with two.

INSERT TABLE 2 HERE

3.3. Multiple regression between the criterion variables and predictor variables

A multiple regression model was performed to test the effects of predictor variables (twenty-four) on criterion variables in connection with the Attitudes Toward Safety Regulations Scale (ATSRS) (see figure 1). This statistical technique objectively evaluates the predictive ability of a set of independent variables (Hair et al., 1999). The data corresponding to the adjusted R^2 indices and significant typified beta coefficients between the criterion variables and predictor variables are shown in Tables 3, 4 and 5. Three multiple linear regression models were used for this purpose.

INSERT FIGURE 1 HERE

The first model identified the degree to which these predictor variables were able to predict Enforcement. Table 3 shows a summary of the model. Here we can see that the predictor variables were Emotional Stability (OP.EE), Social Support (JCQ.SS), Identity (JDS.2), Agreeableness (OP.AG), and Professional efficiency (MBI. PE). These variables

account for 28 % of the criterion variable's variance. Emotional Stability (OP.EE) stands out as the best predictor variable, accounting for 22.5 % of variance. Among the most important aspects are the values of the beta coefficients. From these coefficients we can see that the statistically significant predictor variables were Emotional Stability (β= .251), Social Support (β= .148), Identity (β= .114), Agreeableness (β= .120) and Professional efficiency (β= .127).

INSERT TABLE 3 HERE

The second model identified the degree to which these predictor variables were able to predict General attitudes. Table 4 shows a summary of the model. Here we can see that the predictor variables were Job Demand (JCQ-JD), Openness to experience (OP.OE), Autonomy (JDS.4) and Cynicism (MBI.C). These variables account for 34.3 % of the criterion variable's variance. Psychophysiological Disorders stands out as the best predictor, accounting for 18.7 % of variance. Among the most important aspects are the values of the beta coefficients. From these coefficients we can see that the statistically significant predictor variables were Job Demand (β= .254), Openness to experience (β= -.229), Autonomy (β= .226) and Cynicism (β= .110).

INSERT TABLE 4 HERE

The third model identified the degree to which these predictor variables were able to predict Effectiveness. Table 5 shows a summary of the model. Here we can see that the predictor variables were Professional efficiency (MBI. PE), Agreeableness (OP.Ag), Emotional Stability (OP.EE), Driver Fatigue (DF-8), Openness to experience (OP.OE), Identity (JDS.2), Autonomy (JDS.4), Social Support (JCQ.SS), Physical exertion (SOFI.PE) and Physical discomfort (SOFI.PD). These variables account for 34.7 % of the criterion variable's variance. Professional efficiency stands out as the best predictor, accounting for 22.7 % of variance. Among the most important aspects are the values of the beta coefficient.

From these coefficients we can see that the statistically significant predictor variables were Professional efficiency (β= .282), Agreeableness (β= .148), Emotional Stability (β= .205), Driver Fatigue (β= .106), Openness to experience (β= -.085), Identity (β= .116), Autonomy (β= -.081), Social Support (β= .098), Physical exertion (β= -.133) and Physical discomfort (β= .135).

INSERT TABLE 5 HERE

4. Discussion

These results are in line with the concept that certain variables have predictive power over factors studied in relation to the Attitudes Toward Safety Regulations Scale (ATSRS).

The first hypothesis is partially supported since the best predictive model for Enforcement is the one that includes five variables that affect it positively, i.e. Emotional Stability, Social Support, Identity, Agreeableness and Professional efficiency. In this context, Ulleberg and Rundmo (2003) concluded that personality affects the attitudinal determinants of driving behavior. Montoro et al. (2018), for their part, concluded that factors related to work, personality and other individual factors when combined with road rage increase misconduct on the road that can affect road safety in general. The second hypothesis is also partially supported since the best predictive model for General Attitudes is the one that includes four variables, three of which act positively, i.e. Job Demand, Autonomy and Cynicism, while Openness to experience acts negatively. This supports the idea that job content and the importance a worker gives to it is important in predicting driver behavior (Montoro et al., 2018; Serrano-Fernández et al., 2019; Useche, Ortiz, et al., 2017). Moreover, the determinants of employee engagement suggest a healthy work environment that is positively reflected in the organization (Anitha, 2014). The third hypothesis is also partially supported since the best predictive model for Effectiveness is the one that includes ten

variables. Seven of these act positively, i.e. Professional efficiency, Agreeableness, Emotional Stability, Driver Fatigue, Identity, Social Support and Physical discomfort, while three act negatively, i.e. Openness to experience, Autonomy and Physical exertion. In this context, it has been found that social support and exhaustion predicted fatigue (Tàpia-Caballero, Serrano-Fernández, Boada-Cuerva, et al., n.d.), which decreases driver effectiveness.

The best predictor variable for attitudes towards driving is Emotional Stability. Drivers who scored highly on driving anger and poorly on agreeableness reported driving more aggressively (Dahlen et al., 2005, 2012; Dahlen & White, 2006). Job Demand and Professional efficiency are also good predictors, in this way the job stress of drivers is related to driver burnout (Useche, Cendales, et al., 2017), which affects the attitude of the driver behind the wheel.

5. Conclusion

This study contributes to knowledge of which variables can influence the Attitudes Toward Safety Regulations Scale (ATSRS). It is important to stress the effect personality variables have on attitudes towards driving since we found that Emotional Stability and Agreeableness positively predict Enforcement and Effectiveness. Openness to experience negatively predicts General attitudes, while Extraversion negatively predicts effectiveness. Two of the three Burnout variables have also been shown to be good predictors, i.e. Cynicism for General Attitudes, and Professional efficiency for Enforcement and Effectiveness. The built-in fatigue variables only slightly influenced Effectiveness. Similarly, some characteristics of job content and JDS also only slightly influenced the three dimensions. Professional efficiency (22.7%) and Emotional Stability (22.3%) were the best predictor variables and explained a greater degree of variance.

These results have important practical implications that should be considered for proper strategic management of human resources within organizations so that the variables that influence attitudes towards norms can be detected. Addressing these factors separately may greatly help to identify factors that help workers to improve their health and companies to reduce the number of collisions and traffic violations. It would also encourage the design of interventions that focus on the well-being of professional drivers behind the wheel and the management of their risk behaviors. The present study suggests the need to integrate personality factors and job characteristics in order to take into account the safety of professional drivers and, in parallel, that of pedestrians and other drivers.

This study is not without limitations. Firstly, female representativeness in the sample should be increased. Secondly, these data have been obtained through self-reports, whose measures can produce bias ranging from social desirability to lack of sincerity (Razavi, 2001). Methodology should also be considered since some results may be biased. This is because the participants were sometimes unaware of the symptoms or the effects of the variable we were measuring.

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Table 1

Descriptive statistics and reliability values with Cronbach's alpha coefficient.

Variable	Minimum	Maximum	Mean	*SD*	α
Enforcement (ATRS.ENF)	5	35	23.31	6.28	.85
General attitudes (ATRS.ATT)	4	28	15.73	6.22	.89
Effectiveness (ATRS.EFF)	4	28	19.30	4.66	.78
Extraversion (OP. EX)	18	74	49.29	9.87	.86
Emotional Stability (OP.EE)	4	83	48.76	13.63	.85
Conscientiousness (OP.CO)	12	76	48.99	11.98	.77
Agreeableness (OP.AG)	16	81	48.23	11.81	.72
Openness to experience (OP. OE)	11	69	43.73	10.02	.81
Variety (JDS.1)	3	21	11.30	41.11	.78
Identity (JDS.2)	3	21	15.83	4.23	.77
Significance (JDS.3)	4	21	15.61	3.92	.70
Autonomy (JDS.4)	3	21	13.93	4.54	.74
Feedback (JDS.5)	5	21	15.58	3.36	.71
Agents (JDS.6)	3	21	10.62	4.21	72
Dealing (JDS.7)	3	21	13.18	4.11	.70
Social Support (JCQ.SS)	10	40	26.24	6.00	.88
Job Demand (JCQ-JD)	8	32	21.14	3.54	.75
Job Control (JCQ.JC)	7	28	17.86	4.65	.74
Exhaustion (MBI.E)	0	29	9.27	5.91	.87
Cynicism (MBI.C)	0	24	6.43	4.97	.85
Professional efficiency (MBI. PE)	5	36	27.62	6.37	.79
Driver Fatigue (DF-8)	8	36	17.20	5.76	.86
Lack of energy (SOFI.LE)	0	30	10.94	7.03	.87
Physical exertion (SOFI.PE)	0	30	6.19	5.32	.72
Physical discomfort (SOFI.PD)	0	30	10.14	6.94	.85
Lack of motivation (SOFI.LM)	0	30	8.46	6.30	.83
Sleepiness (SOFI.S)	0	30	10.13	7.12	.88

Variables used in this study: Enforcement (ATRS.ENF), General attitudes (ATRS.ATT), Effectiveness (ATRS.EFF), Extraversion (OP.EX), Emotional Stability (OP.EE), Conscientiousness (OP.CO), Agreeableness (OP.Ag), Openness to experience (OP.OE), Variety (JDS.1), Identity (JDS.2), Significance (JDS.3), Autonomy (JDS.4), Feedback (JDS.5), Agents (JDS.6), Dealing (JDS.7), Social Support (JCQ.SS), Job Demand (JCQ-JD), Job Control (JCQ.JC), Exhaustion (MBI.E), Cynicism (MBI.C), Professional efficiency (MBI.PE), Driver Fatigue (DF-8), Lack of energy (SOFI.LE), Physical exertion (SOFI.PE), Physical discomfort (SOFI.PD), Lack of motivation (SOFI.LM), Sleepiness (SOFI.S).

Table 2

Correlations between predictor variables and criterion variables

PREDICTOR VARIABLES	CRITERION VARIABLES		
	ATRS.ENF	ATRS.ATT	ATRS.EFF
Extraversion (OP. EX)	**.175****	.003	.085
Emotional Stability (OP.EE)	**.474****	**.177****	**.474****
Conscientiousness (OP.CO)	**.375****	**.110***	**.437****
Agreeableness (OP. Ag)	**.362****	-.031	**.396****
Openness to experience (OP. OE)	.012	**-.253****	.062
Variety (JDS.1)	.041	.070	.026
Identity (JDS.2)	**.220****	**.108***	**.215****
Significance (JDS.3)	**.160****	.016	**.183****
Autonomy (JDS.4)	.086	**.232****	.032
Feedback (JDS.5)	**.168****	.082	**.222****
Agents (JDS.6)	.012	.013	.075
Dealing (JDS.7)	.083	-.052	.064
Social Support (JCQ.SS)	**.319****	.083	**.294****
Job Demand (JCQ-JD)	**.284****	**.280****	**.332****
Job Control (JCQ.JC)	**.242****	**.231****	**.215****
Driver Fatigue (DF-8)	-.049	**.176****	.046
Exhaustion (MBI.E)	**-.139****	**.136****	-.015
Cynicism (MBI.C)	**-.204****	**.109***	**-.125****
Professional efficiency (MBI.PE)	**.413****	**.131****	**.478****
Lack of energy (SOFI.LE)	-.064	**.131****	.027
Physical exertion (SOFI.PE)	**-.088***	**.124****	**-.113***
Physical discomfort (SOFI.PD)	-.030	**.134****	.041
Lack of motivation (SOFI.LM)	**-.119****	.084	-.038
Sleepiness (SOFI.S)	-.049	**.115****	-.002

**. The correlation is significant at the 0.01 level (bilateral)

*. The correlation is significant at the 0.05 level (bilateral).

Table 3

Summary of models, variables and coefficients of regression analysis (stepwise method) for Enforcement (ATRS.ENF).

Models and Variables	Models						Coefficients				
	R	R^2	R2 Adjusted	R Change	F Change	sig	B	SE	β	t	sig
Model-1	.474	.225	.223	.225	149.171	.000					
Model-2	.498	.248	.245	.023	15.862	.000					
Model-3	.517	.267	.263	.019	13.331	.000					
Model-4	.527	.278	.272	.011	7.652	.006					
Model-5	.536	.287	.280	.009	6.505	.011					
Op.EE							.115	.025	.251	4.684	.000
JCQ.SS							.155	.043	.148	3.588	.000
JDS.2							.169	.058	.114	2.903	.004
Op.AG							.064	.024	.120	2.688	.007
MBI.PE							.125	.049	.127	2.551	.011

Excluded variables: Op.EX, Op.CO, Op.OP, JDS.1, JDS.3, JDS.4, JDS.5, JDS.6. JDS.7., JCQ2, JCQ.3., MBI.E, MBI.C, SOFI.LE, SOFI.PE, SOFI.PD, SOFI.LM, SOFI.S, DF-8.

Table 4

Summary of models, variables and coefficients of regression analysis (stepwise method) for General attitudes (ATRS.ATT).

Models and Variables	Models						Coefficients				
	R	R^2	R2 Adjusted	R Change	F Change	sig	B	SE	β	t	sig
Model-1	.280	.078	.076	.078	43.643	.000					
Model-2	.372	.138	.135	.060	35.784	.000					
Model-3	.426	.182	.177	.5,64	27.067	.000					
Model-4	.439	.193	.187	.011	7.283	.007					
JCQ-JD							.447	.070	.254	6.361	.000
OP.OE							-.142	.025	-.229	-5.687	.000
JDS.4							.310	.055	.226	5.593	.000
MBI.C							.138	.051	.110	2.699	.007

Excluded variables: OP.EX, OP.EE, OP.CO, OP.AG, JDS.1, JDS.2, JDS.3, JDS.5, JDS.6, JDS.7, JCQ.SS, JCQ.JC, MBI.E, MBI.PE, SOFI.LE, SOFI.PE, SOFI.PD, SOFI.LM, SOFI.S, DF-8.

Table 5

Summary of models, variables and coefficients of regression analysis (stepwise method) for Effectiveness (ATRS.EFF).

Models and Variables	Models						Coefficients				
	R	R^2	R2 Adjusted	R Change	F Change	sig	B	SE	β	t	sig
Model-1	.478	.228	.227	.228	151.930	.000					
Model-2	.531	.282	.279	.054	38.275	.000					
Model-3	.549	.301	.297	.020	14.305	.000					
Model-4	.565	.319	.314	.018	13.458	.000					
Model-5	.571	.327	.320	.007	5.543	.019					
Model-6	.578	.334	.326	.008	5.749	.017					
Model-7	.583	.340	.331	.006	4.849	.028					
Model-8	.588	.346	.336	.006	4.619	.032					
Model-9	.593	.351	.340	.005	4.042	.045					
Model-10	.600	.360	.347	.009	6.713	.010					
MBI.PE							.206	.035	.282	5.841	.000
OP.AG							.058	.017	.148	3.409	.001
OP.EE							.070	.018	.205	3.803	.000
DF-8							.085	.039	.106	2.170	.030
OP.EX							-.040	.019	-.085	-2.158	.031
JDS.2							.128	.042	.116	3.034	.003
JDS.4							-.083	.039	-.081	-2.142	.033
JCQ.SS							.076	.031	.098	2.457	.014
SOFI.PE							-.117	.041	-.133	-2.861	.004
SOFI.PD							.091	.035	.135	2.591	.010

Excluded variables: OP.OE, JDS.1. OP.CO, JDS.3, JDS.5, JDS.6, JDS.7, JCQ.JD, JCQ.JCL, MBI.E, MBI.C, SOFI.LE, SOFI.LM, SOFI.S.

Table 6

Summary of predictive models for criterion variables

PREDICTOR VARIABLES	Factor 1 Enforcement (ATRS.ENF)		Factor 2 *General attitudes (ATRS.ATT)*		Factor 3 *Effectiveness (ATRS.EFF)*	
	ΔR^2 Corrected	β	ΔR^2 Corrected	β	ΔR^2 Corrected	β
Emotional Stability (OP.EE)	.223	.251	-	-	.018	.205
Social Support (JCQ.SS)	.022	.148	-	-	-	-
Identity (JDS.2)	.018	.114	-	-	.006	.116
Agreeableness (OP.AG)	.009	.120	-	-	.052	.148
Professional efficiency (MBI.PE)	.008	.127	-	-	.227	.282
Job Demand (JCQ-JD)	-	-	.076	.254	-	-
Openness to experience (OP.OE)	-	-	.059	-.229	-	-
Autonomy (JDS.4)	-	-	.042	.226	.005	-,081
Cynicism (MBI.C)	-	-	.010	.110	-	-
Driver Fatigue (DF-8)	-	-	-	-	.017	.106
Extraversion (OP.EX)	-	-	-	-	.006	-.085
Social Support (JCQ.SS)	-	-	-	-	.005	.098
Physical exertion (SOFI.PE)	-	-	-	-	.004	-.133
Physical discomfort (SOFI.PD)	-	-	-	-	.007	.135
Total explained variance (%)	28.00	--	18.7	--	34.70	--

All data are significant at $p < .01$ (bilateral).

Figure 1

Model followed in this study