



TEMPERAMENTAL TRAITS AND STYLES OF COPING STRESS IN MOTORCYCLISTS

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Introduction: The aim of the study was to describe the relationship between temperamental traits and styles of coping stress in motorcyclists. The theoretical framework was set out by J. Strelau's Regulative Theory of Temperament as well as R. Lazarus and R. Folkman's Transactional Theory of Stress.

Methods: Two inventories were used, namely, Formal Characteristics of Behavior – Temperament Inventory (FCB-TI), and Coping Inventory for Stressful Situations (CISS) by N. Endler and J. Parker. Twenty-five motorcyclists were surveyed.

Results: We found a relationship between sensory sensitivity, activity and task-oriented coping stress as well as a relationship between emotional reactivity, perseveration and emotion-oriented, and avoidance-oriented coping.

Discussion: We discuss our results with reference to the notion of temperamental need for stimulation, which determines e.g. the willingness to take risk as well as resistance to stress.

Conclusions: There is a correlation between temperamental traits and styles of coping stress.

Keywords: temperament, transportation psychology, styles of coping stress, motorcyclists

INTRODUCTION

Road safety is one of the most important problems of the modern society. According to the reports of the Motor Transport Institute, each year over 6000 people die in road accidents in the European Union [6].

The stereotype of the motorcyclist as a “transplant organ donor” suggests that motorcyclists tend to ignore basic principles of road safety and thereby put their own lives as well as the lives of other roads users at risk. Motorcyclists are typically young people who use their vehicles in order to engage in risky behaviors [19]. The image of motorcyclists created by the media does not hold true for the entire community of motorcyclists. Motorcycle users can be classified according to the type of the owned vehicle such as choppers, motorboats, cross motorcycles, speed motorcycles, as well as with respect to the aim to which they use motorcycles, such as tourism, commuting, impressing peers etc. A more detailed psychological analysis of motorcyclists was carried out by S. Jamson and K. Chorlton [10].

In the literature one can find a lot of studies focusing on the relationship between personality [3], temperament and the styles of coping stress in motorists [17, 23, 27]. For instance, J.T. Wong, Y.S. Chung and S.H. Huang [28], assuming that motorcyclist are a high-risk group of road users, analyzed a group of 683 motorcyclists aged 18-28 years. They described three personality traits that are responsible for breaching safety rules on roads, namely, sensation-seeking, amiability, and impatience. Each of these traits influences the mental processes regulating road-related behaviors. Although amiability is associated with safe road behaviors, the remaining two personality traits, sensation-seeking and impatience, correlated with a low level of situational awareness on road as well as with the tendency to break the traffic code. They also correlated with a tendency towards overly positive self-presentation regarding driving abilities [14].

R. Makarowski, A. Peplinska, and M. Nowopolski studied the relationship between temperamental traits with risky and aggressive behaviors in a group of 267 motorcyclists [16]. Based on cluster and confirmatory analysis, three groups of motorcyclists were distinguished, namely, risk-avoiders, motorcyclists with the “Mad Max syndrome”, and risk-seekers. Risk-avoiding motorcyclists are characterized by a low level of physical, social, ethical, and economic risk. Motorcyclists with the “Mad Max Syndrome” are

characterized by a low strength of neural inhibitory processes, physical and verbal aggression, hostility, and anger. In contrast, risk-seekers are characterized by the following traits: a high mobility of neural processes, high strength of activation, stimulation risk, and a high level of risk acceptance.

Regulative Theory of Temperament by J. Strelau, the theoretical framework of our research [24], underlines the fact that temperamental traits, when compared to personality traits, are less variable. The Regulative Theory of Temperament is a trait theory, where traits are considered to be relatively stable and form the basis for the existence of individual differences. This means that individuals differ from one another with regard to the intensity of a given trait, and at the same time traits as such are stable in the energetic and temporal aspects. It is put forward that traits describing the formal aspect of behavior apply to any and all behaviors regardless of their content. This includes emotional, cognitive, and motor behaviors, which is of high importance with respect to the safety of road-related behaviors, especially when reaction times determined by temperamental traits such as briskness, mobility, stability, tempo, lability, and rhythmicity are taken into account. An aspect of the Regulative Theory of Temperament that is significant from the standpoint of transportation psychology is the behavioral style of motorists defined as a typical way in which an individual behaves [23].

Temperamental risk factors in motorists

There is research linking temperament with the formation of factors associated with risk behaviors [11]. Researchers underscore the functional meaning of temperamental traits, which is reflected by individuals adapting to stimulation requirements of a given situation. According to this view, each individual tends to attain an optimal level of activation. Such a maintenance of a relatively stable level of activation is necessary for effective behavioral and emotional functioning. This means that people either seek or avoid stimulatory activities in order to maintain an optimal level of activation [8]. When the risk taken by a motorist is defined as a conscious decision made in order to attain a specific goal in spite of the existence of danger of a road accident, then stimulation risk and instrumental risk can be distinguished among determinants of risk

behaviors. Stimulation risk is associated with the temperamental mechanism of stimulation seeking, has an impulsive and uncontrollable nature, and is oriented on pleasure seeking, and not on the evaluation of possible losses as is the case with instrumental risk. The hypothesis of Strelau [24] assuming that the level of emotional reactivity determines stimulation-seeking behaviors is supported by multiple empirical studies. For instance, B. Scott-Parker et al. [22] who administered a sociodemographic survey as well as Brief Sensation Seeking Scale, Kessler's Psychological Distress Scale, Sensitivity to Reward Questionnaire and Behavior of Young Novice Drivers Scale to a group of 390 young drivers aged 17-25 years found that stimulation-seeking drivers engage in risky road-related behaviors more frequently and cope with stressful traffic situations more effectively than drivers with a low need for stimulation. This is also confirmed by E. Peer and T. Rosenbloom's research [21]. They performed a study on 2,038 French young drivers in order to assess temperamental traits such as sensation seeking and hostility. They found that these two traits combined are a better predictor of speeding than each of them alone.

Styles of coping stress and road safety

The classic theory of stress by R. Lazarusa and S. Folkman [12] puts forward that cognitive appraisal (primary and secondary) applies to events in the future that are demanding, and which threaten the well-being of an individual by exceeding their coping resources. The process of cognitive appraisal is complex as it involves a transaction between the perceived attributes of a stressful situation (primary appraisal), personal resources (secondary appraisal), and it also takes into account three temporal perspectives, namely, the past (harm), the present (present danger), and the future (challenge). The last temporal perspective is interesting with regard to the relationship between temperament and coping with stress in motorists. It applies to the evaluation of probability of coping with situational challenges, especially because the psychological interpretation of a challenge is comprised of both negative and positive emotional reactions [18]. According to Lazarus's theory of coping, primary and secondary appraisal determines the significance of a given transaction. If the relationship between personal resources and a challenge is deemed stressful, then a cop-

ing strategy is chosen, the realization of which is either conscious or automatic [13].

In the current literature, styles of coping stress are viewed in connection with dispositions of individuals, and their characteristic ways or strategies of coping with stress [5,7]. A number of studies [17,20,23,27] confirm that such defined styles of coping with stress are determined by temperament.

METHODS

The following hypotheses were put forward:

Hypothesis 1

There is an association between temperament and a preferential use of styles of coping stress.

Hypothesis 2

Motorcyclists have a different structure of temperament and use different coping styles in comparison with the control group. Motorcyclists have a lower level of emotional reactivity, sensory sensitivity, perseveration, and a higher level of endurance, activity, and briskness in comparison with the control group.

Hypothesis 3

Motorcyclists use different styles of coping stress in comparison with the control group. Motorcyclists use task-oriented coping more frequently than the control group.

Study group characteristics:

The study was performed in a group of 50 men, aged 19-34 years, of whom 25 were motorcyclists. The control group was comprised of 25 men without a category-A driving license .

The surveyed motorcyclists lived in cities with a population over 200 thousand people, held a driving license for 2-5 years, were amateurs, and had not had a road accident, although almost all admitted to drive over the speed limit frequently.

The study was carried out via mail, following prior contact through social websites.

Methodology:

Temperamental structure was determined by the FCB-TI (Formal Characteristics of Behavior – Temperament Inventory) by B. Zawadzki and J. Strelau [30], on the following six scales:

Briskness (BS) – a tendency to react quickly, and to maintain a high rate of activity, or an ability to change behaviors fast in response to changes in the environment. Perseveration (PV) – a tendency to keep on doing or repeating behaviors after the eliciting stimulus is no longer active. Sensory sensitivity (SS) – an ability to react to sensory stimuli of a low stimulatory value. Emotional reactivity (ER) – a tendency to react strongly to stimuli eliciting emotions, reflected by a high level of emotional sensitivity, and a low level of emotional resilience. Endurance (EN) – an ability to adequately react in situations that are characterized by long periods of highly

stimulating activities and/or under conditions of high external stimulation. Activity (AC) – a tendency to engage in behaviors of high stimulatory value or behaviors providing external stimulation.

Styles of coping stress were evaluated with the Coping Inventory for Stressful Situations (CISS) by N. Endler and J. Parker, in the Polish adaptation by J. Strelau et al. [25]. CISS consists of the following 3 scales, and 2 subscales:

Task-oriented coping (TOC) – this scale is characterized by a style concentrated on taking action in stressful situations. People with high scores in TOC tend to take action in order to

Tab. 1. Relationship between temperamental traits and styles of coping stress in motorcyclists.

	BS	ER	SS	PV	AC	TOC	EOC	AOC	DIS	DIV
BS	1	.560**	.470*	.500*	.206	.420*	-.357	-.287	-.319	-.254
ER		1	-.349	-.626**	-.308	-.255	.528**	.410**	.436*	.225
SS			1	.293	.226	.533**	-.035	-.176	-.187	-.173
EN				1	.023	.267	-.454*	-.305	-.365	-.164
AC					1	-.425*	-.138	-.062	-.021	-.104
TOC						1	-.262	-.368	-.459*	-.151
EOC							1	.645**	.548**	.460*
AOC								1	.871**	.763**
DIS									1	.427*
DIV										1

*P<0.05; **P<0.01

Tab. 2. Comparison of means between motorcyclists and control group with respect to temperamental traits. (Student's t-test).

	Motorcyclists	Control group	Student's t	df	p
BS	16.36	15.36	1.174	48	0.246
ER	7.16	7.08	0.072	48	0.943
SS	14.88	13.80	1.026	48	0.310
EN	14.24	12.12	1.584	48	0.119
AC	12.96	9.84	2.691	48	0.010*

Tab. 3. Comparison of styles of coping stress in motorcyclists and controls (Student's t-test).

Styles	Motorcyclists	Control group	Student's t	df	p
SSZ	56.60	60.16	-0.213	48	0.832
TOC	60.16	36.00	1.590	48	0.118
DIV	14.92	13.12	1.456	48	0.152

Tab. 4. Comparison of styles of coping stress in motorcyclists and controls (Mann-Whitney U-test).

Styles	Motorcyclists		Control group		Mann-Whitney U-test	p
	Mean rank	Sum of ranks	Mean rank	Sum of ranks		
SSE	26.94	673.50	24.06	601.50	-0.699	0.484
ACZ	28.18	704.50	22.82	570.50	-1.304	0.192

resolve or modify a stressful situation. The emphasis is put on the task and problem-solving.

Emotion-oriented coping (EOC) – this style is found in people who tend to behave in an emotional way, expressing emotions such as anger, guilt, and emotional tension under stressful conditions. Such behaviors are to reduce the tension created by a stressful situation.

Avoidance-oriented coping (AOC) – this style of coping is found in people who tend not to think of or experience the problem at hand. AOC comes in two forms, Distraction (DIS) and Social Diversion (DIV).

RESULTS

Statistical analysis was carried out with the use of IBM SPSS version 21 software. Correlational analysis was used in order to verify the hypothesis on the relationship between temperamental traits and styles of coping stress. Pearson *r*-coefficients between temperamental traits and styles of coping with stress are presented in Table 1.

As presented in Tab. 1, there is a positive correlation between briskness, sensory sensitivity, and endurance in the group of motorcyclists. Moreover, there is a negative correlation between briskness and emotional reactivity. The scale of emotional reactivity is negatively related to endurance. Furthermore, we found a negative correlation between the scale of task-oriented coping and the subscale of distraction. Interesting results were seen with respect to the emotion-oriented coping, which correlated positively with avoidance-oriented coping in both of its subscales, namely, distraction and social diversion. It is noteworthy that briskness correlated positively with task-oriented coping with stress. Moreover, the dimension of emotional reactivity also positively correlated with the following scales and subscales: emotion-oriented coping, avoidance-oriented coping, distraction, and social diversion. Sensory sensitivity correlates positively with task-oriented coping, and the scale of endurance was negatively correlated with emotion-oriented coping with stress. Moreover, the dimension of activity was positively correlated with task-oriented coping stress.

In order to compare scores in both groups, we compared the means with the use of the Student's *t*-test. The results are presented in Tab. 2.

We did not find any statistically significant differences between motorcyclists and controls group regarding briskness, reactivity, sensory sensitivity, or endurance. Furthermore, no significant differences were found between these groups regarding perseveration (Mann-Whitney *U*-test). However, a significant difference was found in activity, $t = 2.691$, $P < 0.05$. This means that motorcyclists have a higher level of activity than the control group.

The results regarding differences between the studied groups in styles of coping stress are presented in Tab. 3 and 4.

Based on the Mann-Whitney *U*-test, there were no significant differences between motorcyclists and controls with respect to the use of coping styles.

DISCUSSION

The main aim of this study was to find interrelations between the structure of temperament and styles of coping stress.

We confirmed the first hypothesis on the relationship between temperamental traits and a preferential use of coping styles. We found that the higher the emotional reactivity and perseveration are, the more likely are people to use emotion-oriented coping. This observation is in line with previous research [2,26]. Moreover, we found a relationship between sensory sensitivity and task-oriented coping. Based on this observation, one can assume that the ability to perceive different types of stimuli while riding a motorcycle plays a role in taking appropriate action in dangerous situations. The proper perception of less intense stimuli might be accounted for by the experience in riding a motorcycle [1]. This was not studied herein and therefore requires further research. This also applies to the correlation between endurance and emotion-oriented coping, which was found to be negative in previous studies. These results are in line with R. Makarowski and Plope's research [17] regarding glider pilots as well as our own research carried out among air-traffic controllers [27].

The negative correlations between reactivity and avoidance-oriented coping in the form of distraction, and the positive correlation between emotional reactivity and emotion-oriented coping suggest that employment of either of these two styles by motorists might be situation-dependent and related to the type of road danger. This is confirmed by the correla-

tion between perseveration and avoidance-oriented coping in the form of social diversion, which suggests that in stressful situations motorcyclists prefer avoidance-oriented coping or emotion-oriented coping. In view of Strelau's theory (2006), where risk can be regarded as a source of stimulation, a high level of emotional reactivity and perseveration can be treated as an indicator of a low need for stimulation. Because of that, individuals characterized by such a constellation of traits and little driving experience will tend to avoid uncertainty and risky behaviors [15].

Hypothesis two, assuming that motorcyclists will have a different structure of temperament than controls, reflected by a low level of emotional reactivity, sensory sensitivity, perseveration, and a high level of endurance, activity and briskness was not confirmed. However, a statistically significant difference between motorcyclists and controls was found with respect to the temperamental trait of activity. Motorcyclists have a higher level of activity, which according to the previous research might be due to their young age and lack of experience, and predisposes to risk behaviors (e.g. a tendency to ride over the speed limit) and dangerous road situations [20].

Hypothesis three, assuming that motorcyclists will use task-oriented coping more frequently than controls, was not confirmed. Our results suggest that, due to a young age, individuals in both groups overestimated their ability to cope with stress. Similar interpretations can be found in literature on the subject matter [9].

In conclusion, when interpreting our results regarding hypotheses 2 and 3, one should bear in mind that in view of other authors motorcyclists are not a homogenous group in terms of the style of riding and coping with traffic-related stress. These authors claim that the prediction of road-related behaviors of young drivers is beyond the capabilities of psychosocial theories [22, 29]. This is confirmed by R. Makarowski, A. Peplinsk, and M. Nowopolski's research [16] who found 11% of motorcyclists not to drive excessively fast, 28% to avoid risk, every fourth motorcyclist to present symptoms of aggressive behavior, and 15% to be risk-seekers. Furthermore, the psychometric tool used to assess coping with stress might not be adequate with respect to stressful situations commonly found in traffic [14].

CONCLUSIONS:

1. There is an association between temperamental dimension and styles of coping stress. High levels of sensory sensitivity and activity correlate with task-oriented coping, and high levels of emotional reactivity and perseveration predispose to emotion-oriented and avoidance-oriented coping.
2. No significant individual differences were found between motorcyclists and controls regarding the structure of temperament and preferred styles of coping stress.

AUTHORS' DECLARATION:

Study Design: Jan F. Terelak, Jowita Dykas; **Data Collection:** Jowita Dykas; **Statistical Analysis:** Jowita Dykas; **Manuscript Preparation:** Jan F. Terelak; **Funds Collection:** Jan F. Terelak, Jowita Dykas. The Authors declare that there is no conflict of interest.

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