How You Deal with Your Emotions Is How You Drive. Emotion Regulation Strategies, Traffic Offenses, and the Mediating Role of Driving Styles

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Abstract: Past research indicated the importance of traffic safety and driving behaviors for the sustainability of the traffic system. The aim of this study was to examine the effect of emotion regulation on drivers’ tendency to obey or transgress traffic rules. A sample of 554 Romanian drivers completed a set of measures assessing their driving styles, traffic offenses, and their habitual use of three emotion regulation strategies. The results of the mediation analyses showed that two of these strategies, i.e., reappraisal and experiential avoidance, are associated with less traffic offenses, and that specific driving styles mediate these effects. While the behavioral effects of experiential avoidance were mixed in valence, reappraisal was found to diminish the use of maladaptive driving styles and to foster careful driving. Overall, this pattern of results indicates the potential benefits of future interventions aiming to develop drivers’ abilities to regulate their emotions, especially through reappraisal, for increasing traffic safety.

Keywords: traffic outcomes; traffic offenses; driving style; emotion regulation strategies; reappraisal; avoidance; traffic safety

1. Introduction

Road traffic accidents (RTA) represent a major factor of human causalities, as 20 to 50 million suffer non-fatal injuries and more than 1.35 million people die each year [1]. Traffic offenses are the most frequent form of law violation [2] and are frequently related to accident involvement, stronger associations being generally found in young drivers [3]. Given the constant increase of traffic offenses and RTAs, one of the 2030 targets in the World Health Organization (WHO) agenda for sustainable development is halving the number of injuries and deaths resulting from road traffic crashes [1]. In Romania, easy or near-crashes increased by 4.02% in 2019 as compared to 2018, with nearly 23,000 contraventions that generated traffic accidents being reported [4]. Past research indicates drivers’ behavior to be the most influential factor in reducing road traffic accidents and traffic offenses and increasing traffic safety and sustainability [5], and several interventions were developed to reduce speeding behavior [6]. An individual’s driving style is considered to be one of the most important factors commonly related to speeding choice and compliance to traffic laws [7]. Furthermore, another facet of driving style relevant for sustainability pertains to the conclusion of previous studies that changing to a more adaptive driving style may lead to reducing gas consumption by up to 40% [8].

An individual’s driving style refers to the way the driver chooses to drive, reflecting their decisions about driving speed and headway, as well as level of assertiveness and attentiveness [7]. Previous findings suggested the prevalence of several driving styles, defined by different individual characteristics. Several driving styles are considered maladaptive, such as the risky, angry, anxious,
dissociative, and violation of rule driving styles, whereas the careful and distress reduction driving styles are considered to be adaptive. The risky driving style defines drivers that take risks in pursuit of enjoyment and arousal, whereas the angry driving style is frequently displayed in violent actions being accompanied by strong negative emotions. The anxious driving style defines individuals that are more hesitant and make effective decisions in traffic with difficulty and the dissociative driving style describes an individual’s tendency to commit errors in traffic due to the rapidness in getting distracted. The distress reduction style characterizes a driver that tends to reduce their distress experienced while driving by engaging in relaxing activities and the careful driving style refers to one’s inclination to be polite towards other road users during driving and to feel no time pressure. Lastly, the violation of rules contextually perceived as irrational is a context-specific driving style and it refers to a driver’s tendency to break the traffic laws when they are perceived as inadequate to the current traffic situation [9]. Previous findings suggested that the maladaptive driving styles are positively associated with traffic offenses and accident involvement, whereas the more adaptive driving styles are negatively related to traffic outcomes [10–12]. Moreover, previous findings [13] suggested that the maladaptive driving style of individuals with previous traffic offenses (i.e., risky, angry, and less careful) is a significant predictor of reoffending.

In terms of driving habit formation and individual differences, previous studies focused on individual drivers’ characteristics, such as gender, driving exposure, and age [14], and personality factors or traffic attitudes [9,15–17]. Yet, little is known about the emotional factors influencing one’s predominant driving style, even though both the adaptive and maladaptive styles are strongly influenced and accentuated by emotional experiences. Previous studies based on naturalistic data suggested that driving under emotional circumstances elevated driving risk by almost 10%. When combined with the drivers’ judgement error as a cause of aggressive driving (mostly as a function of intensive emotions), the odd ratio of driving risk increases by 34.8% [18]. Furthermore, Eboli (2017) suggested that behavioral-emotional elements impact the shift between driving styles; those experiencing anger endorsing an angrier driving style, whereas those experiencing worry endorsing a more cautious driving style [19]. Previous findings suggested that the risky and angry driving styles are positively related to anger [20] and sensation seeking [21], whereas anxiety and neuroticism were positively associated with the anxious and careful driving styles [16]. Furthermore, the emotional induction of negative affect led to an increase in driving errors [22], risky and aggressive driving [23], and a decrease in hazard perception and steering [24]. Thus, negative emotions while driving affect both individuals’ performance and their driving style.

In dealing with the consequences of emotions, emotional regulation comprises all the strategies, either conscious or unconscious, that people use in the attempt to reduce, maintain, or increase their emotions [25]. The process model of emotion regulation describes two general categories of emotion regulation strategies. The antecedent-focused strategies, which include situation selection and modification, attentional deployment, and cognitive reappraisal, intervene before the affective processes generate a full-blown emotional reaction. The response-focused strategies (i.e., response modulation through suppression or expression of emotion) occur after the emotional reactions are generated [26].

Among these strategies, reappraisal and suppression (both expressive and experiential, i.e., experiential avoidance) have been the most widely investigated. Reappraisal intervenes early in the process of emotion generation and past studies indicate its adaptive and relatively effortless character [27]. Previous findings suggested that reappraisal is frequently successful in changing emotions [28] and reappraisal frequency is positively related to adaptive outcomes, including better physical health [29], more positive social outcomes [30], greater psychological well-being [31], and fewer psychopathological symptoms [32]. In contrast, suppression occurs in the last stage of the affective generative process, with studies indicating it as a maladaptive form of emotion regulation. Previous studies suggested that suppression use is strongly related to more negative consequences, such as hypersensitivity to anxiety-related thoughts and depression [33], lower wellbeing and relationship
satisfaction, and more symptoms of psychopathology [31,34,35]. Furthermore, reappraisal has been related to higher cognitive control and beneficial consequences on decision making [36], whereas suppression was related to negative outcomes [37].

Although the importance of regulating drivers’ emotions has been highlighted [38,39], the topic of emotion regulation strategies in traffic has been scarcely studied. Previous studies on this topic emphasized the effect of emotion regulation difficulties on traffic behavior. Recent studies [40] suggested that emotion regulation difficulties are associated with maladaptive driving styles, and that lower difficulties in emotional regulation were associated with careful driving [41]. Furthermore, Šeibokaite [42] showed that difficulties in emotion regulation were positively related to aggressive and ordinary violations, driving errors, and lapses. On the topic of violations, Parlangeli [43] showed that young drivers use of reappraisal led to an increase of traffic risk perceptions (i.e., errors, lapses, aggressive and ordinary violations), while suppression was positively associated with the perceived risk/danger of violations. Still, the effects of emotion regulation strategies on driving styles or traffic outcomes have not yet been investigated.

The aim of the present study was to investigate the effect of specific emotion regulation strategies on traffic outcomes, as well as to test the mediating role of driving styles in this relationship. Our general hypothesis is that drivers’ habitual use of specific emotion regulation strategies fosters specific driving styles. We expect the habitual use of adaptive emotion regulation strategies, such as reappraisal, to be associated with more adaptive driving styles, whereas the chronic use of experiential avoidance to foster maladaptive driving styles. Furthermore, we expect driving styles to be differentially related to drivers’ frequency of traffic offenses.

2. Materials and Methods

2.1. Participants

Five hundred and fifty-four Romanian drivers participated in this research (50% men). Their age ranged from 19 to 73 (M = 37.09; SD = 12.71). Driving experience (i.e., license tenure) ranged from 10 months to 53 years (M = 11.87; SD = 9.31). Their average mileage in the last year was 14,568.44 km (SD = 33,536.50).

2.2. Procedure

The Research Ethics Committee at Alexandru Ioan Cuza University gave ethics approval for this research. The authors instructed 50 field operators (students) to identify among their acquaintances at least four people (both genders being equally represented) possessing a driving license and driving regularly. The students performed this task in exchange for academic credits. All potential participants were informed about the aims of the research. Their confidentiality as research participants was ensured. All participants gave their informed consent. The average time for responding to the research questionnaire was 20 min.

2.3. Measures

Driving styles were assessed using the Multidimensional driving style inventory (MDSI-RO), a 41-item scale previously validated in the Romanian driving context [9]. A 6-point scale (from (1) “never” to (6) “always”) was used to elicit participants’ degree of agreement with each item. The instrument measures seven driving styles: violation of rules contextually perceived as irrational, anxious, patient-careful, risky, angry-high velocity, distress-reduction, and dissociative driving style. Average scores for each dimension were computed. The instrument showed satisfactory internal reliability as indicated by the mean inter-item correlations, although Cronbach’s Alpha suggests that the distress reduction scale has lower reliability, as shown in Table 1.

Expressive suppression and cognitive reappraisal were assessed using the ten-item scale Emotion Regulation Questionnaire (ERQ) [31]. Each item was rated on a 7-point scale, from 1 (strongly disagree) to 7 (strongly agree). Average scores for both dimensions were computed. The mean inter-item correlations indicate satisfactory internal reliability, while Cronbach’s Alpha suggests a lower reliability of the expressive suppression scale, as shown in Table 1.
Experiential avoidance was evaluated through the short form of the Acceptance and Action Questionnaire (AAQ-II) [37]. The AAQ-II has seven items designed to address various manifestations of experiential avoidance. The participants assessed the degree to which the content of each item applies to them on a 7-point scale (from 1 ("never true") to 7 ("always true")). Each participant obtained an average score on experiential avoidance and the instrument was found to have good internal reliability, as shown in Table 1.

### Table 1. Summary statistics for emotion regulation strategies and driving style.

| Strategy                  | Alpha | Mean Inter-Item Correlation | Min | Max | M    | SD  | Skewness (SE) | Kurtosis (SE) |
|---------------------------|-------|-----------------------------|-----|-----|------|-----|---------------|---------------|
| Reappraisal               | 0.74  | 0.34                        | 1   | 7   | 4.73 | 0.88| -0.35 (0.10)  | 1.06 (0.20)   |
| Expressive suppression    | 0.55  | 0.23                        | 1   | 7   | 3.68 | 0.94| 0.16 (0.10)   | 0.44 (0.20)   |
| Experiential avoidance    | 0.74  | 0.28                        | 1   | 7   | 2.56 | 1.04| 0.78 (0.10)   | 0.32 (0.20)   |
| MDSI—rule violation       | 0.84  | 0.47                        | 1   | 6   | 3.09 | 1.18| 0.17 (0.10)   | -0.80 (0.20)  |
| MDSI—anxious              | 0.80  | 0.48                        | 1   | 6   | 2.01 | 0.95| 1.01 (0.10)   | 0.58 (0.20)   |
| MDSI—careful              | 0.73  | 0.29                        | 1   | 6   | 4.97 | 0.74| -0.92 (0.10)  | 0.85 (0.20)   |
| MDSI—risky                | 0.75  | 0.34                        | 1   | 6   | 2.63 | 0.93| 0.53 (0.10)   | 0.004 (0.20)  |
| MDSI—angry                | 0.81  | 0.35                        | 1   | 6   | 3.01 | 0.92| 0.24 (0.10)   | -0.30 (0.20)  |
| MDSI—distress             | 0.61  | 0.29                        | 1   | 6   | 4.17 | 1.01| -0.45 (0.10)  | -0.25 (0.20)  |
| MDSI—dissociative         | 0.70  | 0.28                        | 1   | 6   | 1.91 | 0.70| 1.18 (0.10)   | 1.73 (0.20)   |

Multidimensional driving style inventory (MDSI).

Participants also reported several demographic information and driving history data (i.e., average mileage, traffic license tenure, traffic offenses since obtaining traffic license).

### 3. Results

#### 3.1. Preliminary Results

First, we tested all the variables for normality, taking into account the range values for skewness and kurtosis, namely ±2 [44,45]. Table 1 presents the summary statistics for driving styles and emotional regulation strategies.

#### 3.2. Correlational Analysis

Pearson correlations were computed between all the variables, as shown in Table 2. Results indicated that traffic offenses significantly and positively correlated with the rule violation, risky, and angry driving styles, and negatively correlated with the anxious and careful driving styles. Traffic offenses also significantly correlated with reappraisal and experiential avoidance. Furthermore, the habitual use of reappraisal significantly correlated with the rule violation, anxious, risky, and distress reduction driving styles, whereas experiential avoidance emerged as associated with the angry, risky, anxious, dissociative, and careful driving styles. In regard to the two sociodemographic variables, male drivers were found to have more traffic offenses and higher scores on the risky, rule violation, and angry driving styles, while women scored higher on the careful, anxious, and dissociative styles. Age was negatively related to the rule violation, risky, distress reduction, and angry driving styles, as well as to the use of reappraisal and avoidance. As expected, age was positively associated with drivers’ number of past offenses, due to the higher license tenure and driving experience. The effect sizes were small to medium according to Cohen’s [46] criteria.
Table 2. Correlation matrix between traffic offenses, emotion regulation strategies, driving styles, and sociodemographics (age and gender).

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|
|     |     |     |     |     |     |     |     |     |      |      |      |      |
| 1. Traffic offenses | -0.12 ** | 0.04 | -0.14 ** | 0.23 ** | -0.09 * | -0.16 ** | 0.12 * | 0.20 ** | 0.02 | 0.01 | 0.31 ** | -0.14 ** |
| 2. Reappraisal | -0.14 ** | 0.03 | -0.14 ** | -0.14 ** | -0.03 | 0.14 ** | -0.08 | -0.11 ** | 0.11 ** | -0.01 | -0.09 * | 0.11 * |
| 3. Expressive suppression | 0.02 | 0.02 | 0.34 ** | -0.12 ** | 0.10 * | 0.14 ** | -0.03 | 0.30 ** | -0.12 * | 0.12 * | 0.12 ** |      |
| 4. Experiential avoidance | -0.03 | -0.03 | -0.39 ** | 0.54 ** | 0.64 ** | 0.25 ** | 0.17 ** | 0.17 ** |      |      |      |      |
| 5. MDSI—rule violation | -0.23 ** | -0.06 | 0.12 ** | -0.14 ** | 0.54 ** | 0.01 | 0.14 ** |      |      |      |      |      |
| 6. MDSI—anxious | -0.45 ** | -0.48 ** | 0.03 | 0.03 | 0.14 ** | 0.08 | 0.14 ** |      |      |      |      |      |
| 7. MDSI—careful | 0.59 ** | 0.21 ** | 0.14 ** | -0.16 ** | -0.20 ** |      |      |      |      |      |      |      |
| 8. MDSI—risky | -0.01 | 0.22 ** | -0.10 * | -0.10 * | -0.10 * |      |      |      |      |      |      |      |
| 9. MDSI—angry | -0.12 ** | -0.03 | 0.05 | 0.05 | 0.05 |      |      |      |      |      |      |      |
| 10. MDSI—distress | -0.02 | 0.13 ** | 0.07 | 0.07 | 0.07 |      |      |      |      |      |      |      |
| 11. MDSI—dissociative | -0.07 |      |      |      |      |      |      |      |      |      |      |      |
| 12. Age | -0.07 |      |      |      |      |      |      |      |      |      |      |      |
| 13. Gender |      |      |      |      |      |      |      |      |      |      |      |      |

* p < 0.05; ** p < 0.01; Note. All gender correlations represent point biserial coefficients.
The resulted pattern of correlations suggested that traffic offenses are less frequently committed by drivers who habitually use reappraisal and experiential avoidance. Moreover, these two emotional regulation strategies are also significantly related to certain driving styles. The rule violation, risky, and angry driving styles are in turn positively associated with traffic offenses, while the careful and anxious styles have a negative relationship with offenses. Hence, we focused on these driving styles as potential mediators of the influence of emotional strategies (reappraisal and experiential avoidance) on traffic offenses.

3.3. Testing for Mediation

Further analysis was performed to examine the potential indirect effect of the habitual use of specific emotional regulation strategies on traffic offenses, mediated by driving styles. We used the PROCESS custom dialog for IBM SPSS [47] to test the hypothesized mediation model. PROCESS uses a nonparametric and less biased approach to examine the statistical significance of the mediation effects, by generating bootstrap-based confidence intervals. In estimating 95% confidence intervals, 5000 resamples were used [48]. Confidence intervals that do not include zero pinpoint indirect effects that are significantly different from zero at \( p < 0.05 \) (two-tail) and, thus, indicate that the effects of specific emotion regulation strategies on traffic offenses are mediated by that specific driving style.

We examined two mediation models, one for each of the two emotion regulation strategies that emerged in the previous analysis as related to traffic offenses, i.e., reappraisal and experiential suppression. Each model included as mediators the driving styles that are significantly associated with that specific emotion regulation strategy. Furthermore, each mediation analysis was done while controlling for the effects of age and gender.

The first analysis included the reappraisal strategy and the rule violation, careful, and angry driving styles. Furthermore, age and gender were included as covariates. Reappraisal was significantly related to traffic offenses (\( B = -0.38; p = 0.03 \)), indicating that higher reappraisal use was associated with fewer traffic offenses. Further, reappraisal was significantly related to the rule violation driving style (\( B = -0.18; p = 0.002 \)) which was significantly related to traffic offenses (\( B = 0.51; p = 0.003 \)). Reappraisal significantly predicted both careful driving style (\( B = 0.11; p = 0.002 \)) and the angry driving style (\( B = -0.12; p = 0.008 \)). However, neither the careful (\( B = -0.32; p = 0.15 \)) nor the angry (\( B = 0.34; p = 0.12 \)) style significantly predicted traffic offenses. The 95% bootstrap confidence interval (CI) for the rule violation driving style did not contain the zero value, as shown in Table 3; thus, the mediated effect of this driving style was significant. For both the careful and angry driving styles, the 95% bootstrap CIs contained the zero value, indicating that the mediated effect of these driving styles were not significant. Finally, the direct relation between reappraisal and traffic offenses became weaker and failed to yield the significance level. Therefore, the rule violation style completely accounted for the effect of reappraisal on traffic offenses, as shown in Figure 1.

**Table 3.** The indirect effects of reappraisal and avoidance on traffic offenses through driving styles, while controlling for age and gender.

|                     | Bias Corrected              |
|---------------------|-----------------------------|
|                     | Point Estimate | SE  | 95% Lower | 95% Upper |
| **Reappraisal**     |               |     |           |           |
| Rule violation      | −0.09          | 0.05| −0.1922   | −0.0191   |
| Careful             | −0.03          | 0.03| −0.0997   | 0.0082    |
| Angry               | −0.03          | 0.03| −0.1112   | 0.0065    |
| **Avoidance**       |               |     |           |           |
| Anxious             | −0.13          | 0.05| −0.2317   | −0.0395   |
| Angry               | 0.10           | 0.04| 0.0350    | 0.1867    |
| Careful             | 0.06           | 0.03| 0.0090    | 0.1250    |
| Risky               | −0.001         | 0.02| −0.0452   | 0.0385    |
The second mediation analysis included experiential avoidance and the anxious, angry, careful, and risky driving styles. We also included age and gender as covariates. Avoidance significantly predicted traffic offenses ($B = -0.31; p = 0.03$), suggesting that the habitual use of experiential avoidance was associated with fewer traffic offenses. Furthermore, avoidance significantly predicted the anxious ($B = 0.31; p < 0.001$), angry ($B = 0.13; p < 0.001$), careful ($B = -0.09; p = 0.002$), and risky driving styles ($B = 0.10; p = 0.01$). Furthermore, the anxious ($B = -0.42; p = 0.02$), angry ($B = 0.79; p < 0.001$), and careful driving styles ($B = -0.59; p = 0.01$) significantly predicted traffic offenses, whereas the risky driving style ($B = -0.01; p = 0.97$) failed to yield the significance level. The 95% bootstrap confidence intervals (CIs) for the anxious, angry, and careful driving styles did not contain the zero value, as shown in Table 3; thus, the mediated effect of these driving styles was significant. Lastly, the relation between avoidance and traffic offenses remained statistically significant. Therefore, the anxious, angry, and careful driving styles only partially accounted for the effect of avoidance on traffic offenses, as shown in Figure 2.

**Figure 1.** The mediation path from reappraisal to traffic offenses through driving style, while controlling for age and gender. The values represent unstandardized coefficients. * $p < 0.05$; ** $p < 0.01$.

**Figure 2.** The mediation path from avoidance to traffic offenses through driving style, while controlling for age and gender. The values represent unstandardized coefficients. * $p < 0.05$; ** $p < 0.01$. 

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3.4. Emotion Regulation Strategies and Driving Styles According to the Number of Traffic Offenses

We further tested for differences according to drivers’ record of traffic offenses. Participants were distributed into two groups according to the median threshold of traffic offenses, namely low number of traffic offenses (none or 1) and high (at least 2). Multiple t-tests indicated several significant differences between the two groups on driving styles and emotion regulation strategies, as shown in Table 4. Results suggested that drivers with a high number of traffic offenses scored lower on reappraisal and on the avoidance and careful driving styles compared to those with a low number of traffic offenses. The latter scored lower on expressive suppression and on the rule violation, risky, and angry driving styles. This pattern of results further suggests that drivers with a low number of offenses habitually use more adaptive driving styles and emotion regulation strategies.

Table 4. Differences on emotion regulation strategies and driving styles according to the number of traffic offenses.

|                     | Number of Traffic Offenses |       |       |
|---------------------|----------------------------|-------|-------|
|                     | Low (N = 321)              | High (N = 233) |
|                     | M (SD)                     | M (SD) | t     |
| Reappraisal         | 4.79 (0.87)                | 4.64 (0.89) | 1.97 *|
| Expressive suppression | 3.61 (0.97)            | 3.78 (0.90) | −0.02.09 *|
| Avoidance           | 2.67 (1.06)                | 2.43 (1.00) | 2.55 *|
| MDSI—Rule violation | 2.79 (1.10)                | 3.51 (1.16) | −7.44 **|
| MDSI—Anxious        | 2.07 (0.97)                | 1.93 (0.93) | 1.75  |
| MDSI—Careful        | 5.08 (0.73)                | 4.84 (0.74) | 3.72 **|
| MDSI—Risky          | 2.49 (0.89)                | 2.83 (0.97) | −4.20 **|
| MDSI—Angry          | 2.84 (0.89)                | 3.24 (0.92) | −5.14 **|
| MDSI—Distress       | 4.16 (1.00)                | 4.19 (1.02) | −0.25  |
| MDSI—Dissociative   | 1.92 (0.74)                | 1.89 (0.65) | 0.71  |

* p < 0.05; ** p < 0.01.

4. Discussion

This study tested the general hypothesis that drivers’ habitual use of specific emotion regulation strategies is associated with variations in their tendency to disobey traffic rules, captured through their past traffic offenses. We also expected these relationships to be mediated by driving styles, taking into account the behavioral effects of the different emotion regulation strategies and the traffic outcomes of the various driving styles. Results support this assumption in the case of two strategies, i.e., reappraisal and experiential avoidance, each influencing traffic offenses either directly or through specific driving styles.

Reappraisal was found to lead to fewer traffic offenses, partly due to its negative effect on the rule violation style. More specifically, results suggest that drivers who habitually use reappraisal are less inclined to transgress traffic rules even in the situations in which they might appear as inadequate. This behavioral influence has, in turn, significant benefits in terms of traffic outcomes, i.e., fewer traffic offenses. Moreover, reappraisal emerged as having other positive effects on drivers’ traffic behavior, by reducing their angry driving reactions and by favoring the careful driving style. The effect of this strategy of increasing the perceived risk of driving errors and violations, which was previously documented [43], probably contributes to the more careful driving style of individuals with high reappraisal tendencies. Altogether, our results extend past findings in the area and pinpoint the positive influence of reappraisal on driving behaviors, decisions, and outcomes. This pattern of effects is also consonant with the previously highlighted beneficial consequences of this emotion regulation strategy in other areas of psychological and social functioning. Being able and inclined to change the meaning of the negatively-charged situation at hand was found to be positively associated with psychological well-being and to various social outcomes [30,31]. It is important to note that
these influences are based on the efficiency of reappraisal to regulate the negative emotions that the individual experiences. Similarly, the beneficial effects suggested by our results in terms of driving behaviors and outcomes are related to the high frequency of negative emotions that traffic situations elicit. Drivers who reappraise these situations and thus attenuate the accompanying emotions are those less prone to display maladaptive driving styles and commit traffic offenses.

Results also show that experiential avoidance is related to the anxious, angry, careful, and risky driving styles, and that the first three of these styles mediate its effect on traffic offenses. The valence of these indirect effects was mixed, indicating that avoidance leads to more traffic offenses by inducing an angrier and less careful driving style, while at the same time rendering drivers more prone to use an anxious style, which is negatively related to traffic offenses. Yet, the latter indirect effect is lower than the other two positive indirect effects of avoidance on traffic offenses. Besides these indirect influences, avoidance also emerged as having an opposed and larger direct negative effect of being associated with fewer traffic offenses, which is most relevant in terms of the objective consequences of this emotion regulation strategy. The result that experiential avoidance is related to a lower tendency to infringe traffic laws runs contrary to our expectation, which was built on previous findings about the negative psychological effects of this strategy [34,35]. This apparent contradiction may stem from the difference in time frame between the general psychological consequences of avoidance and its effects in driving. Concerning the former, avoiding or suppressing current feelings provokes the latter reoccurrence of that negative state and of its associated thoughts [33]. While this psychological mechanism aggravates the latter effects of the postponed emotions and generally affects one’s well-being, our findings suggest that avoiding negative emotions in traffic situations is an effective manner of reducing their intensity and consequently avoiding the maladaptive behaviors that they motivate, such as driving maneuvers that transgress traffic laws.

Overall, both sets of results converge in supporting the positive influences of the two emotion regulation strategies on traffic outcomes, mediated by various driving styles. These findings are in line with past studies that revealed that drivers with difficulties in regulating their emotions are more prone to maladaptive traffic maneuvers [41,42]. Our results support this relationship by indicating that drivers who do regulate their emotions are less inclined to such maneuvers. Moreover, they also extend previous conclusions by highlighting two specific strategies of emotion regulation that are especially effective in reducing drivers’ tendency to disobey traffic rules, i.e., reappraisal and experiential avoidance, although the latter also has less desirable effects on driving styles. Thus, these strategies should be those targeted by future road safety interventions aiming to reduce traffic risk by developing drivers’ emotion regulation abilities, in line with previously formulated suggestions in the traffic literature [42].

The pattern of relationships between driving styles and traffic outcomes that emerged in our results corresponds to those found by past research, opposing the maladaptive (especially the risky, angry, and rule violation) styles to the adaptive careful style [10,11]. While our study focused on emotion regulation as a potential factor that could improve traffic behavior and consequently traffic outcomes, further studies should extend this approach by examining other psychological competencies that could be developed in drivers in order to foster more adaptive driving styles and increase traffic safety. Such interventions could be especially fruitful in correcting the maladaptive driving styles of those with previous offenses [13], thus reducing their risk of reoffending.

Results also highlight several gender differences on the study dimensions. Firstly, they indicate that male drivers commit more traffic offenses than women, in line with previous gender comparisons [49]. Secondly, women drivers in our sample were found to drive in more careful, anxious, and dissociative manners, and to be less risky and angry than men, and to be also less prone to violate traffic rules. These differences in driving styles correspond to past research on gender differences in driving behaviors, which indicate that male drivers tend to display more maladaptive driving styles (i.e., risky and angry), which further lead to more offenses and road accidents than those committed by women [9,11,12]. Lastly, our results also suggest that women are more inclined to regulate their
emotions through reappraisal, while men use expressive suppression more frequently than women, in line with past investigations that showed that women tend to use more adaptive emotion regulation strategies [50]. Furthermore, we also found experiential avoidance to be used more often by women.

The associations between age and driving styles in our results correspond to previous findings that indicate young drivers to be more prone to display maladaptive driving styles [9,11,12]. Specifically, our results suggest that older drivers, compared to their younger counterparts, are less inclined to manifest risky, rule violating, and angry behaviors in traffic, as well as to use a distress reduction style, the latter probably due to their higher driving experience. On the other hand, young drivers are more inclined to regulate their emotions through reappraisal and, a result previously reported by past studies [50], as well as through experiential avoidance.

The comparisons between the two groups defined by frequency of traffic violations showed that drivers with a higher record of traffic offenses are more engaged in risky, angry, and rule violating driving than those at the other end of traffic offenses. Contrarily, the latter are more prone to adopt the careful driving styles. Moreover, drivers who have committed more traffic violations are less inclined to use reappraisal and avoidance habitually in order to regulate their emotions. Overall, these differences provide a supplementary support to our two mediation models that describe the effect of each emotion regulation strategy on drivers’ tendency to commit traffic offenses and the roles of specific driving styles in mediating this influence.

One of the limits of this research is its use of self-report instruments. Another one is that we investigated the effects of drivers’ habitual use of emotion regulation strategies, and not the direct use of these strategies on a currently experienced emotion in a traffic scenario. Future experimental research should provide more in-depth tests of the influences of reappraisal and avoidance that are suggested by our results.

The effects of the two emotion regulation strategies on driving styles are important for other facets of sustainability besides traffic safety [5]. For instance, keeping or breaking speed limits, which is a behavioral aspect that most driving styles pertain to, has direct consequences on fuel consumption [51–53]. Further studies could examine the role of emotion regulation in improving other dimensions of driving behaviors and decisions that are relevant for sustainability.

To conclude, the present research found that drivers’ habitual use of reappraisal and experiential avoidance reduce their tendency to commit traffic offenses. This effect was partly due to the behavioral influence of these emotion regulation strategies, especially reappraisal, of favoring more adaptive driving styles. The current pattern of findings might inform future interventions aimed at increasing compliance with traffic rules and consequently contributing to more sustainable traffic safety.

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