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# The association between national culture, road safety performance and support for policy measures

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ABSTRACT

There are considerable differences between countries when it comes to road safety performance, as indicated by the number of road fatalities per 100,000 inhabitants. These discrepancies are strongly associated with differences in wealth and prosperity, as expected, but are also related to national culture. The overall objective of this exploratory study is to identify relationships between national culture, road safety performance and public support for policy measures. Using the revised version of Hofstede's cultural dimensions, we show the strong correlation between national culture and road safety performance, which exists even after controlling for the national level of wealth as measured by the gross national income. Furthermore, by combining the national cultural dimensions with data on 29 countries from the second stage of ESRA, the *E*-Survey of Road users' Attitudes, this study demonstrates that culture also affects the level of public support for policy measures related to road safety. Specifically, for many measures, the degree of individualism accounts for a considerable part of the statistical variation in the public support for policy measures across countries—except for those measures for which the support is very high in most countries. Possible explanations are given for the seemingly paradoxical finding that countries which witness high resistance to road safety policy measures have nevertheless managed to achieve better road safety performance.



## 1. Introduction

### 1.1. Addressing the road safety challenge

One common goal across countries is making roads safer and reducing road fatalities—currently estimated by the World Health Organisation (WHO) at over 1.35 million a year [1]. Globally, road traffic injury is the leading cause of death in children and young adults aged 5–29 years [1].When comparing countries' road safety performance, the most frequently used indicator is the number of road fatalities per 100,000 people. Data for this indicator can be found in the WHO Global Status Report on Road Safety [1]. When excluding the very low values for three small countries (Maledives, San Marino and Micronesia), this indicator currently varies between 2.7 (Switzerland and Norway) and 35.9 (Liberia) [1], illustrating the huge differences between countries in terms of road safety performance.

Many of the road deaths are preventable, as fatalities and long-term injuries from road accidents are a largely predictable and avoidable problem which enables rational analysis and remedy [2]. Road safety improvements require an integrated approach and multipronged actions, such as in road infrastructure, vehicle technology, human behaviour, appropriate policy measures, and effective enforcement. However, there are several reasons why appropriate policy measures to address road safety are not easily implemented: insufficient human and financial resources, an efficient decision-making process, changing political priorities, scepticism about the expected effectiveness, lack of technical expertise, etc. From the perspective of policy makers, two considerations are of particular importance. The first is the cost of implementing the measure, both for the public authorities (at the national, regional, or local level) or for road users themselves. These costs may be perceived as too high for the expected benefits, or the required funding may not be available or considered more useful for other public needs. Another important consideration of policy-makers is insufficient public support and the apprehension (or evidence) that a majority of the population would oppose the measure. Such opposition may be due to various reasons such as expected costs for citizens, perceived restriction of freedom, lack of trust in a proper implementation of the measure, or perceived discrimination between groups of road users.

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Public support for policy measures in road safety has been analysed in several countries for one or more measures. Most of these studies are based on national opinion polls and surveys – some examples are [3–10]. Although survey methodologies and question formulation differs, often such studies have shown considerable public support for the proposed road safety measures and interventions. However, public support for road safety measures has rarely been examined across a large number of countries—exceptions are the items discussed in the reports on SARTRE2 [11], SARTRE4 [12] and ESRA1 [13,14] and those currently being examined in the context of ESRA2 [15]. National and international studies have mainly focused on the characteristics of the population groups that support or oppose policy measures in road safety, but limited attention was paid to the factors that could explain these differences in the level of public support.

### 1.2. Culture and its relation to road safety performance

Hofstede defined culture as the 'programming of the human mind' by which one group distinguishes itself from another group [16]. This 'programming of the human mind' refers to norms, beliefs, values, and practices that are found more frequently among some people than in others. Schwartz viewed culture as 'the rich complex of meanings, beliefs, practices, symbols, norms, and values prevalent among people in a society' [17].

Culture itself is a product of various factors, including tradition, history and regulation, and how systems such as education, law enforcement, the labour market, social security, public health and infrastructure function. Thus, culture shapes the society and vice versa. For instance, in many countries attitudes towards drunk driving have changed considerably since the late twentieth century—a cultural change that was the result, at least in part, of changing legislation and increasing enforcement levels.

The insight that culture affects road safety performance is not new. A road safety target hierarchy was developed In 2000 in New Zealand in which 'Culture and Structure' was the lowest layer, and road safety performance and outcomes were the highest layers [18]. This conceptual framework was presented under the form of a 'road safety pyramid' which gained popularity in the road safety world. It has often been used as a framework for assessing national road safety performance [19,20]), and for benchmarking and road safety performance indicators – see e.g. [21]. Within this road safety pyramid, culture is seen as an input factor (in addition to demography, geography, climate, political organisation, …) for the road safety policy, measures and interventions. In other words, cultural characteristics influence how and what policy measures can be taken. However, for this 'culture and structure layer', there are no internationally comparable quantitative indicators.

Another perspective on the role of culture in road safety have been brought under the umbrella of 'Traffic Safety Culture' (TSC), a concept that evolved out of organizational safety culture in the United States [22]. Originally TSC referred to a strong road safety culture within companies, but it was gradually given a broader meaning [23] and gained interest outside the United States (e.g. [24]) Efforts have been made to operationalize TSC into quantitative indicators (see e.g. [25] and also within the ESRA initiative (www.esranet.eu), but there is no scientific consensus about such indicators. The TSC concept has also been used for explaining road safety performance differences between countries in a qualitative way [26]. A recent book [27] describes well the state of the art on TSC. In this book, Ward [28] proposes a definition of TSC as "the shared beliefs of a group that affect behaviors related to traffic safety" and further states that "the traffic safety culture of a group emerges from actions taken by stakeholders across the social ecology", whereby stakeholders not only refer to public authorities but also families, schools and workplaces.

The traffic safety culture in a country can thus be seen as an 'expression' of the national culture in terms of road safety attitudes and behaviour. For example, if the national culture in a particular country highly values risk taking, risky behaviours on the road are likely to be more acceptable in that country than elsewhere. And if the national culture is strongly opposed to governmental interventions, one can imagine a strong resistance against road safety measures seen to restrict freedom of mobility.

But wat should be understood by 'national culture'? Following Hofstede [16] national culture should be seen as the collection of norms, beliefs, values, and practices that distinguish the citizens of one country from those of another. It is recognized that using an entire country as the unit for measuring culture can be criticised, because in some cases, heterogeneous cultural groups can coexist within one country. Nonetheless, the country level has proven to be an excellent anchor for measuring culture. People within a country tend to share the same educational system, legal system, and institutions, among other elements [29]. The concept of national culture has even been demonstrated to be meaningful in African countries where borders were drawn more or less arbitrarily, and for a country like Malaysia that only exists for about 50 years [30]. These findings were based on a cluster analysis using data from the World Values Survey (worldvaluessurvey.org). Moreover, a major advantage of measuring culture at the country level is that most statistical data are available at the national level, and this allows researchers to detect associations between culture and other indicators, such as those of road safety.

Hofstede assumed that all societies face similar basic challenges such as inequality, an uncertain future, and the relationship between individuals and groups [31]. However, societies tackle these challenges differently, and these different attitudes and practices are part of their culture. Culture has a regulatory role in that it determines what kind of behaviour is considered normal and acceptable within a country. Therefore, it affects people's everyday behaviour. For example, national cultures differ regarding in which situations it is acceptable for a pedestrian to cross the road when the light is red. Is it always or never? Or only if no children are around? Or only when no police officers can be seen? In deciding whether to cross the road at a red light, most people are strongly influenced by the norms and behaviour of those around them. When travelling to other countries, one may notice that the typical behaviour in such a situation differs—sometimes, even if the legislation is identical.

National culture reflects current behaviour but has also an impact on how and to what extent behaviours can be changed. Public institutions aim to increase the quality of life of their citizens, but this may require people to adapt their behaviour. People have a natural tendency to resist others' decisions, particularly when they doubt their relevance and/or when it may require them to change their habits. Hence, it can be expected that the level and nature of support for new policy measures are strongly determined by the national culture.

### 1.3. Operationalising national culture

Hofstede was the first to demonstrate the feasibility of quantifying culture through specific cultural dimensions, which enabled the comparison of culture across countries. Hofstede initially introduced four dimensions and later expanded these to six. These six dimensions are listed in Table 1.

Researchers have examined the relationship between Hofstede's cultural model and the road fatality rate for varying sets of countries – see, for instance, Hofstede [31], Özkan & Lajunen [32], Melinder [33], Gaygisiz [34,35] and Solmazer [36]. In these studies, the dimensions of uncertainty avoidance, individualism, masculinity, and power distance have been found to be correlated with the relative number of road traffic fatalities for certain groups of countries. Recently, new measures of culture have been developed to predict consumer behaviour. These have led to updated versions of two of Hofstede's original dimensions: 'individualism versus collectivism' and 'long-term versus short-term orientation' [37–39]. The association of these new indicators with the fatality rate has not yet been examined.

**Table 1**
Hofstede's six cultural dimensions.
Source: Based on publications by Hofstede [16,31].

| | |
|---|---|
| Power distance | How a society generates solutions to resolve inequality among members |
| Uncertainty avoidance | The cultural tendency to be uncomfortable when encountering an unknown future |
| Individualism versus collectivism | The societal position on the value of loose ties among members versus the integration of members with their own groups |
| Masculinity versus femininity | The cultural tendency for differentiating emotional roles based on gender |
| Long-term versus Short-term orientation | The cultural preference of placing individuals' focus on the future versus on the past and present |
| Indulgence versus restraint | The culture preference for gratification versus control of basic human desires related to enjoying life |

Other approaches to operationalising culture, such as the Schwartz Value Survey [40], the World Value Survey (www.worldvaluessurvey.org), and the GLOBE study [41], have introduced many more cultural dimensions. Schwartz's cultural value orientations are based on analysing common problems faced by every society and the societies' preferences in addressing these issues. His seven societal value orientations are listed in Table 2.

Interestingly, despite their different perspectives, these international models often identify similar cultural clusters of countries. After considering the most prominent cultural models, among them the Schwartz Value Survey [17], the GLOBE study [41], and dimensions of the World Values Survey [42], Fog [43] has demonstrated that most cultural dimensions from the different models can be clustered into two main factors: one superfactor that reflects the combined effects of development and modernization, together with social-psychological effects such as collectivism, conservatism, regality, and tightness. The second factor, called tentatively the 'East Asian factor', combines several effects related to East Asian cultures, and possibly also differences in response style [43].

### 1.4. Aims and scope of the study

The overall objective of this exploratory study is to identify relationships between national culture, road safety performance and public support for policy measures. The underlying hypothesis is that such relationships exist, since in the road safety research world it is generally accepted that culture and road safety policy affect road safety performance [19]. More specifically the study aims at obtaining an overall picture of (1) how strongly national culture is related to road safety performance and (2) how strongly public support for policy measures in road safety is related to the national culture. This is an area for which little empirical data is available, and for which no comprehensive models have been developed yet.

**Table 2**
Schwartz' seven cultural value orientations.
Source: Based on Schwartz [17].

| | |
|---|---|
| Intellectual autonomy | Encourages individuals to pursue their own ideas and intellectual directions independently. Important values include broadmindedness, curiosity, and creativity. |
| Affective autonomy | Encourages individuals to pursue affectively positive experience for themselves. Important values include pleasure, exciting life, and varied life. Meaning in life comes largely through social relationships and through identifying with the group. |
| Embedded cultures | Emphasise maintaining the status quo and restraining actions that might disrupt in-group solidarity or the traditional order. Important values are social order, respect for tradition, security, obedience, and wisdom. |
| Cultural egalitarianism | Induces people to recognise one another as moral equals who share basic interests as human beings. Important values include equality, social justice, responsibility, help, and honesty. |
| Cultural hierarchy | Relies on hierarchical systems of ascribed roles to ensure responsible, productive behaviour. Important values include social power, authority, humility, and wealth. |
| Harmony | Emphasises fitting into the world as it is, trying to understand and appreciate rather than change, direct, or exploit. Important values include world peace, unity with nature, and protecting the environment. |
| Mastery | Encourages active self-assertion to master, direct, and change the natural and social environment to attain group or personal goals. Important values include ambition, success, daring, and competence. |

### 1.5. Organisation of the paper

After this introductory section on the context and the aims of the study, Section 2 provides information on the databases and methodologies used. Section 3 presents the results of the analysis on the relationships between Hofstede's national cultural values – both traditional and new ones – and national road safety performance, based on WHO data. In Section 4 results are presented on the relationship between these cultural dimensions, in particular 'Individualism versus Collectivism', and ESRA2 data on public support for 15 policy measures. The relationship between driving behaviour, level of enforcement and support for policy measures is also examined. Following a presentation of the overall results, some examples of support for particular measures are provided. The discussion in Section 5 focuses on the role of culture in road safety and the results presented in Section 3 and 4, which might seem contradictory at first sight. Section 6 summarizes the main findings of the study. The Annex includes a table listing the countries involved in the different analyses.

## 2. Data and methodologies used

### 2.1. Data sources

This study links data from four international databases containing national indicators: data on road fatalities from the WHO (www.who.int), data on national culture from Hofstede Insights (www.hofstede-insights.com), and data on support for policy measures from ESRA (www.esranet.eu).

The methods for data collection used for these indicators are well documented in the literature. In short, the WHO collects data on road safety fatalities and context information from national authorities on a three-yearly basis. The data is scrutinized and processed and is made available through a website (www.who.int/violence_injury_prevention/road_safety_status/2018/en/) and the Global Status Report on Road Safety. The latest version has been used (2018) [1], referring to fatalities in 2016. It should be noted that, for some countries, the WHO values are estimates based on advanced statistical modelling. Particularly in low- and middle-income countries, these estimates are considerably higher than the countries' official statistics on road traffic fatalities. The WHO database was used for fatality rates and Gross National Income (GNI) per capita, which is an indicator for prosperity.

The method used to calculate the original Hofstede values are well documented in Hofstede's original articles and books (see e.g. [16]). Scores not originating from Hofstede's initial research, which was based on a survey among IBM employees worldwide, have been added over the years, mostly through various specific research projects (for example [44,45]). The values can be accessed through the website of Hofstede Insights (www.hofstede-insights.com). Many of the values have been calculated more than 20 years ago. The recently updated values for Individualism and Long term Orientation were based on online panel survey questionnaires, recruiting respondents corresponding in gender and age to the population included in the national census of the countries concerned. The probabilistic sampling used for the updating of the values, differs greatly from that employed in Hofstede's original research 30 years ago, The data for these new

values were collected in the period 2014–2016. The methodology for calculating these values is described in several articles, including one of Minkov [37]; the values themselves were obtained directly from Hofstede Insights.

ESRA (www.esranet.eu) is a joint initiative involving road safety institutes, research centres, public services, and private sponsors from across the world. The aim is to collect and analyse comparable data on road safety issues, including on road safety culture and support for policy measures. ESRA data are collected through online panel surveys using a representative sample of the national adult population in each participating country (typically, $N = 1000$ per country). The ESRA methodology is described in a methodology report [46] and by Pires, the first article in the special issue of IATSS Research on ESRA [47]. In the first wave of ESRA2, data were collected in 2018 in 32 countries. This dataset has been used for the analyses in this paper, mainly for data for data on support for measures, but also on driving behaviour and enforcement (see Section 4).

Since all the data sources use different sets of countries, a table has been created listing the countries used for all the correlation analyses and added as an Annex to this Article (Table 9).

### 2.2. Methodologies used

Given the exploratory nature of this study, the focus was on correlation analyses, including partial correlations, of data from different data sources. The countries which are used for each of the correlation analyses are listed in Table 9 in Annex.

It was beyond the scope of this study to develop a theoretical model that could explain the associations found. It is further recognized that correlation analyses (including controlling for another variable) cannot provide full insight in associations between variables, but should be seen as a first step. Regression analysis was not considered suitable given the correlation between the predictor variables that could be used (e.g. fatality rate, prosperity, individualism, flexibility) and the low number of countries (29) for which data on public support for policy measures is available.

For all statistical analyses, SPSS version 25 was used [48]. When presenting countries in figures, three-digit ISO 3166 country codes are used (https://www.iso.org/obp/ui/#search).

### 2.3. Limitations of the data and methodologies used

The data for the calculation of the revised Hofstede cultural dimensions and the ESRA indicators are based on online surveys and are self-reported. In general, self-reported data are prone to biases [49,50], such as the desirability bias—the tendency of respondents to provide answers which present a favourable image of themselves; bias through misunderstanding of questions (e.g. questions with difficult words, long questions); or recall error—unintentional faulty answers due to memory errors. However, given the focus on respondents' opinions rather than on behaviour, such bias might be relatively low: probably lower than if face-to-face surveys were conducted.

However, it is recognized that the interpretation of some questions may vary between countries. For example, in more collectivistic countries, people may tend to express support for a measure as they may feel that it will not affect their lives. Respondents who support a measure have a certain perception of how the regulation might be implemented in their country and to what extent it might still be easy to neglect the regulation. Such a perception is likely to be based on experience with the implementation of other regulations, or even with their general attitude towards respecting a law – e.g. for some people a regulation is sacrosanct whilst for others it is more a guiding principle from which one can deviate.

Another potential limitation is the representativeness of the surveyed population, mainly for countries with low rates of internet use. However, internet penetration is very high in most of the countries included in the current analyses, except in some African countries.

Most analyses presented in this paper are based on correlations and partial correlations. The number of countries involved in these correlation analyses differed strongly: between 96 countries for the correlation between the traditional Hofstede cultural dimensions and fatality rate, and 29 countries for the correlation between the new Hofstede dimensions and support for policy measures. Thus, the results of the correlation analyses are not necessarily comparable.

## 3. Results on the association between national culture and road safety performance

### 3.1. Using the traditional Hofstede cultural dimensions

For analysing the relationship between culture and road safety performance, we started with the most recent versions of Hofstede's 'traditional' national cultural values and the number of road safety fatalities per 100,000 people in 2016. Correlations were calculated for the dimensions Power Distance, Individualism, Masculinity and Uncertainty Avoidance (each 96 countries), Long Term Orientation (83 countries) and Indulgence (77 countries). The Pearson correlation coefficients and their significance levels are given in Table 3. The list of countries concerned can be found in Table 9 in the Annex.

Clearly, for this group of countries, which represent over 80% of the world population, a strong correlation is evident between the fatality rates and three of Hofstede's cultural dimensions: power distance, individualism, and long-term orientation. The higher the power distance, the more collectivistic, and the more short-term oriented a country scores on Hofstede's traditional model, the higher the road fatality rate of the country.

### 3.2. Using the revised Hofstede values for individualism and long-term orientation

As mentioned in Section 1.2, two of Hofstede's dimensions have recently been updated, resulting in revised scores for countries: individualism-collectivism [38] and long-term orientation [39]. We calculated Pearson correlation coefficients for the 51 countries (see Table 9 in Annex) for which data on these new dimensions and WHO fatality rates were available. While the updated individualism dimension was more strongly correlated ($-0.751$, $p < 0.01$) with fatality rates than the traditional measure ($-0.593$), the correlation of the updated long-term orientation was slightly lower ($-0.488$, $p < 0.01$) than the original version ($-0.517$). These differences between the correlations of the old and new measures could be due to the revised scales themselves, cultural evolution over time, and/or the lower number of countries involved in the second analysis.

The strong association between the new individualism construct and the fatality rate for the 51 countries is displayed in Fig. 1. As can

**Table 3**
Correlation coefficients between Hofstede's 6 traditional dimensions and fatality rates. Source: Cultural values provided by Hofstede Insights; fatality dates from WHO [1].

| Cultural dimensions | Number of countries | Pearson correlation | Significance (p) |
|---|---|---|---|
| Power distance | 96 | 0.516 | 0.000 |
| Individualism | 96 | −0.593 | 0.000 |
| Masculinity | 96 | −0.001 | 0.992 |
| Uncertainty avoidance | 96 | −0.120 | 0.245 |
| Long-term orientation | 83 | −0.517 | 0.000 |
| Indulgence | 77 | 0.070 | 0.514 |

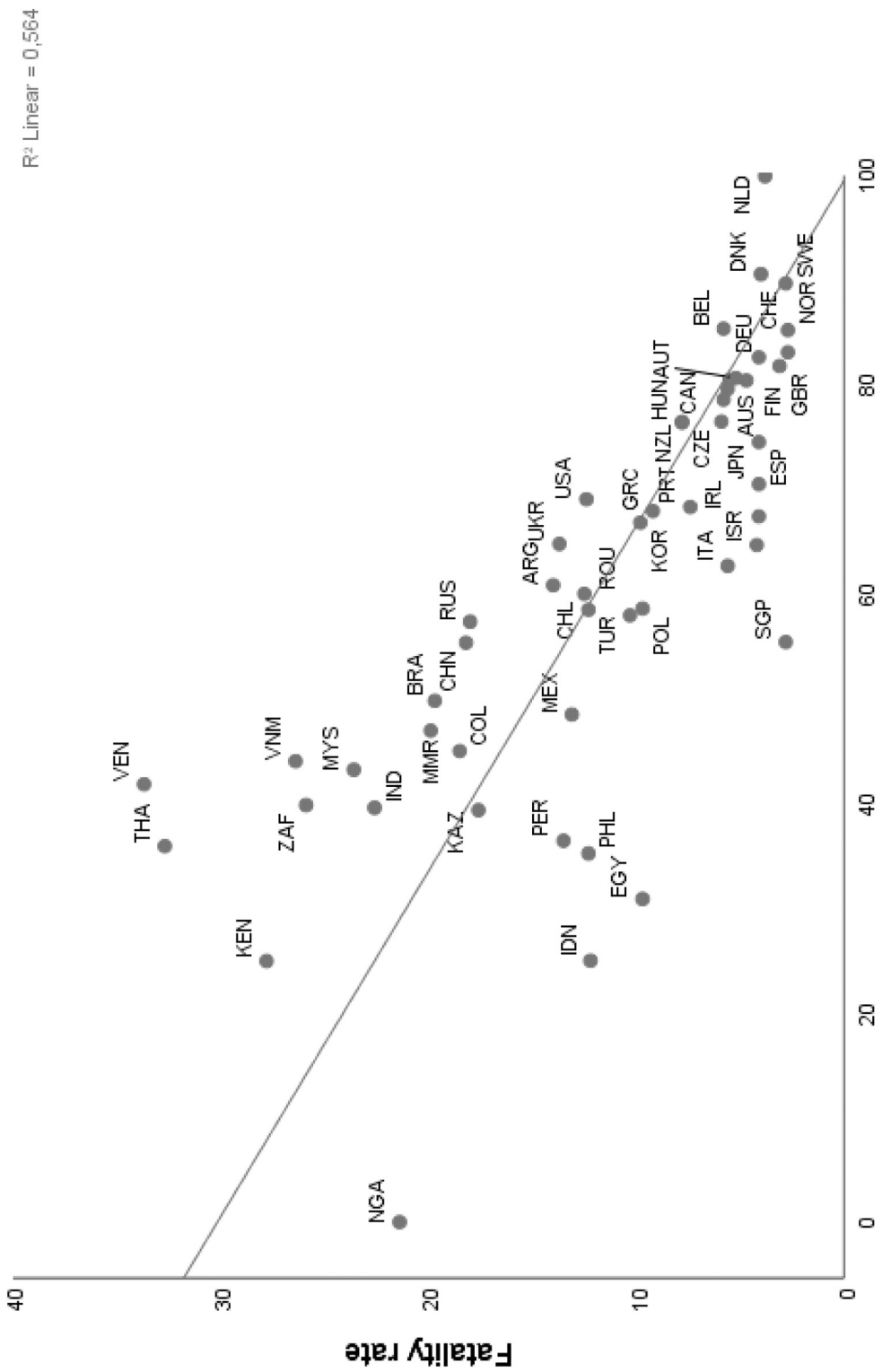


**Fig. 1.** Relationship between the new individualism construct and the fatality rates.

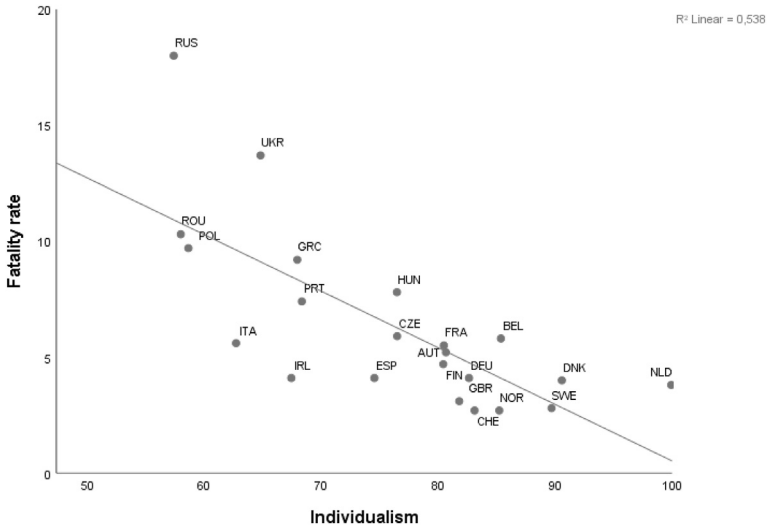


**Fig. 2.** Scatterplot of European values for individualism and fatality rates.

be seen, individualism can statistically explain over 50% of the variance between countries.

### 3.3. The impact of wealth and prosperity at the national level

Both individualism and long-term orientation (also called 'flexibility versus monumentalism' or simply 'flexibility' in the updated version) appear to be strongly correlated with the prosperity of a country. The correlation coefficient between individualism and gross national income (GNI; as reported in the WHO Global Status Report on Road Safety [1]) is 0.767 ($p < 0.01$) and between flexibility and GNI is 0.465 ($p < 0.01$). The values for both cultural dimensions tend to be higher in high-income countries and wealthier societies.

Since individualism, flexibility, and GNI are correlated, it is not meaningful to undertake regression analyses with these variables as predictors and road safety performance as the dependent variable. Instead, to illustrate the relative effect of culture independent of GNI, we calculated partial correlations for the two cultural dimensions while controlling for GNI. As expected, the correlation coefficients decreased for both dimensions. However, for individualism the coefficient remained high ($-0.448$, $p < 0.01$). For flexibility, the revised correlation was lower ($-0.249$) and no longer statistically insignificant at the 0.05 level ($p = 0.081$).

Thus, among countries with similar levels of wealth, those with a more collectivistic culture tend to have higher numbers of fatalities and, thus, lower road safety performance. An example is the comparison of Denmark and the USA, which have similar levels of GNI per capita. However, Denmark scores much higher on individualism than the USA, and its fatality rate is only one-third of that of the USA.

It can be observed from Fig. 1 that most European countries are clustered in the lower-right corner. One could thus wonder whether the correlation still holds if only European countries were considered. Further analysis indicates that this is indeed the case, as shown in Fig. 2. As one can observe, Russia is an outlier; by removing it the association within Europe would become even stronger.

## 4. The association between national culture and support for road safety policy measures

### 4.1. International public support for the 15 policy measures in the ESRA2 survey

One question in the ESRA2 survey asked respondents about the extent to which they supported certain road safety policy measures (15 in total). The specific formulation is given in Table 4.

For most countries and measures, the level of support, as measured by the percentage of respondents responding to the aforementioned question with a score of 4 or 5 on a 5-point Likert scale, varied between 40% and 90%. Overall, most respondents tended to support the policy measures proposed in the survey, both in the sampled high- and middle-income countries. In fact, for some measures, over three quarters of the respondents were in favour, and support was often higher in the middle-income countries. Fig. 3 shows the level of support for the sample, illustrating the considerable differences between them. More detailed results can be found in an ESRA Thematic Report [15] (in press).

### 4.2. The association between road safety performance and support for measures

We imagined initially two possible types of association between the road safety performance of a country and the support for policy

**Table 4**
Formulation of the question on public support in ESRA2 and answer options. Source: ESRA2 methodology report [46].

Do you oppose or support a legal obligation to …
1. install an alcohol 'interlock' for drivers who have been caught drunk driving on more than one occasion (technology that won't let the car start if the driver's alcohol level is over the legal limit)?
2. have zero tolerance for alcohol (0,0 ‰) for novice drivers (licence obtained less than 2 years ago)?
3. have zero tolerance for alcohol (0,0 ‰) for all drivers?
4. install intelligent speed assistance (ISA) in new cars (which automatically limits the maximum speed of the vehicle and can be turned off manually)?
5. install dynamic speed warning signs (traffic control devices that are programmed to provide a message to drivers exceeding a certain speed threshold)?
6. have a seatbelt reminder system for the front and back seats in new cars?
7. require all cyclists to wear a helmet?
8. require cyclists under the age of 12 to wear a helmet?
9. require all moped drivers and motorcyclists to wear a helmet?
10. require pedestrians to wear reflective material when walking on the streets in the dark?
11. require cyclists to wear reflective material when cycling in the dark?
12. require moped drivers and motorcyclists to wear reflective material when driving in the dark?
13. have zero tolerance for using any type of mobile phone while driving (hand--held or hands-free) for all drivers?
14. not using headphones (or earbuds) while walking on the streets?
15. not using headphones (or earbuds) while riding a bicycle?

Respondents indicated their answers on a scale from 1 to 5, where 1 implies 'oppose' and 5 implies 'support'. The answers were dichotomised into support (= score 4–5) and oppose/neutral (= score 1–3).

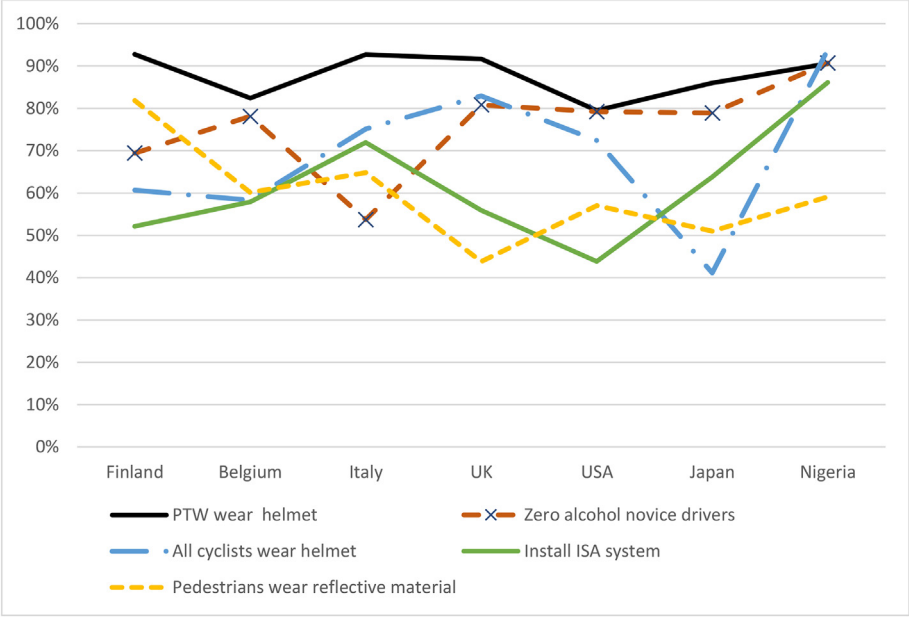


**Fig. 3.** Level of support for some measures in selected countries.

measures. One possible association was that the better the road safety performance of a country (i.e. the lower the road fatality rate), the higher the resistance against new policy measures. The factors explaining such an association would be that a relatively high road safety performance might reduce people's perceived need to improve road safety further and/or might cause apprehension that the expected additional gains would come at an excessively high burden or cost. The second possible association asserts the opposite—the better the road safety performance of a country, the higher the support for new policy measures. Such a situation would reflect a national safety culture which prioritises avoiding road traffic casualties and in which new measures are welcomed because of the appreciation for the value generated by previous measures.

The results in Table 5 tend to support more the first set of assumptions. The second column of this table includes the correlation coefficients between the relative number of road fatalities on the one hand, and the 15 policy measures that were included in ESRA2 on the other (in the table, the names of the policy measures have been shortened). The results are based on all 32 countries.

As one can observe from Table 5, for eight (of 15) measures, the correlations with fatality rates are positive and (highly) statistically significant; for three measures, the correlation is positive (about 0.3) but not significant; and for four measures, the correlation is low (below 0.2) and insignificant. In other words, in countries with fewer fatalities, the resistance against new measures is generally higher than in those with more fatalities. Further analysis has shown that several measures with low correlations, such as riders of powered two-wheelers needing to wear helmets (see Fig. 4), are supported by a large majority of the national population, irrespective of the country's road safety performance. For such measures with high support, it would be difficult to find correlations with other national indicators, such as culture.

**Table 5**
Pearson correlations between national public support for policy measures (ESRA2 data) and the relative number of road fatalities (WHO data), without and with control for individualism (Hofstede Insights data).

| | Number of road fatalities per 100,000 inhabitants | | Idem, after controlling for individualism | |
|---|---|---|---|---|
| | Correlation | Significance ($p$) | Correlation | Significance ($p$) |
| Alcohol interlock for recidivists | 0.436* | 0.013 | 0.111 | 0.574 |
| Zero alcohol for novice drivers | 0.154 | 0.400 | 0.024 | 0.902 |
| Zero alcohol for all drivers | 0.518** | 0.002 | −0.166 | 0.398 |
| Install ISA systems | 0.610** | 0.000 | −0.042 | 0.831 |
| Install speed warning signs | 0.648** | 0.000 | −0.004 | 0.985 |
| Seatbelt reminder for all seats | 0.526** | 0.002 | 0.179 | 0.363 |
| All cyclists wearing helmets | 0.473** | 0.006 | −0.117 | 0.554 |
| Children cyclists wearing helmets | 0.194 | 0.286 | −0.079 | 0.689 |
| PTW[1] riders wearing helmets | 0.054 | 0.767 | −0.157 | 0.426 |
| Pedestrians wearing refl. material | 0.088 | 0.630 | 0.174 | 0.376 |
| Cyclists wearing reflective material | 0.275 | 0.128 | 0.029 | 0.885 |
| PTW riders wearing reflective material | 0.294 | 0.102 | 0.052 | 0.791 |
| No use of mobile phones inside cars | 0.496** | 0.004 | 0.277 | 0.154 |
| No use of headphones by cyclists | 0.321 | 0.073 | 0.099 | 0.618 |
| No use of headphones by pedestrians | 0.694** | 0.000 | 0.442 | 0.019** |

* $p < 0.05$.
** $p < 0.01$.
[1] PTW = Powered Two-Wheelers (mopeds, motorcycles, …).

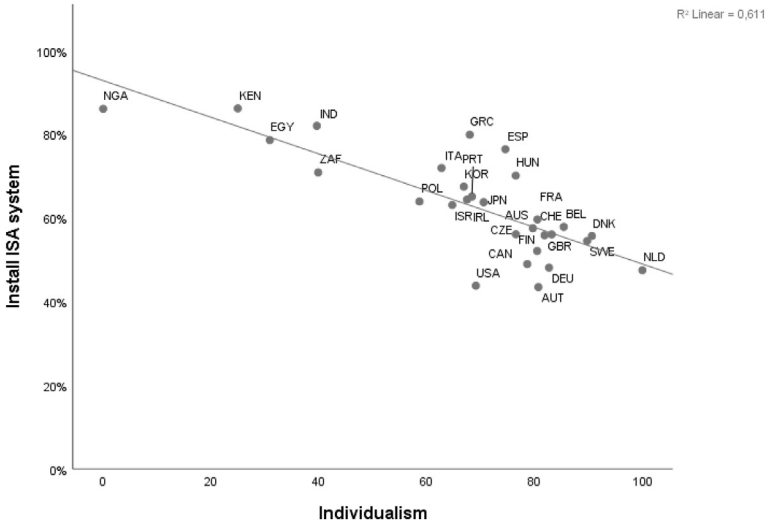


**Fig. 4.** Scatterplot of individualism versus 'installation of ISA systems'.

### *4.3. The relation between driving behaviour, level of enforcement, and support for policy measures*

The ESRA2 survey also included questions about self-reported behaviour and the level of enforcement for particular offences. It seems plausible to assume that risky drivers and those who do not adhere to traffic rules will tend to oppose new and stricter road safety measures. However, does this assumption apply at the national level? In other words, is the opposition against policy measures higher in countries with a higher number of offenders?

Table 6 shows that such an expected relationship holds for speeding: in countries with a higher number of drivers who are speeding, there is lower public support for the introduction of further anti-speeding measures. The relationship is more complex for driving under the influence (DUI): in countries with higher proportions of people driving with a Blood Alcohol Concentration (BAC) above the national legal limit, we see higher opposition against a proposed zero BAC limit. However, no such statistically significant relationship exists for DUI in general (including DUI under the BAC limit): for the 32 countries sampled, a higher number of DUI drivers does not lead to a statistically significantly lower public support for anti-drunk driving measures (although this relationship might be valid at the individual level). Table 6 also indicates no relationship at the national level between distraction by phone and the level of support for further restrictions on the use of mobile phones by car drivers. In summary, the relationship between the proportion of traffic offenders in a country and public support for new measures is ambiguous.

One may also expect a relationship between the level of enforcement (i.e. the probability to be checked by the police) in a country and how opposed people are against new measures; in countries with a low level of enforcement, people may be less opposed to measures, since their risk of getting caught is low anyway. Detailed comparable cross-country data on police checks are not available, but the ESRA survey includes a proxy—the expectation of being checked by the police during a typical journey. The correlations between these values and the level of support for policy measures are provided in Table 7.

As above, the relationship between enforcement level and public support is strong for speeding. In countries with many speeding checks—implying that people are used to being checked while speeding—the acceptance of installing intelligent speed assistance (ISA) and speed warning systems is higher than in countries with lower levels of anti-speeding enforcement. However, for DUI and distraction by phone, no statistically significant relationship is observed at country level, except for alcohol interlock for recidivist drivers: for these offences, differences between countries in the number of police checks are not statistically related to the level of public support.

### *4.4. The association between individualism and support for policy measures*

Section 3.2 illustrated that better road safety performance is correlated with higher levels of individualism. Hence, it is to be expected that the correlations between road fatality rates and support for policy measures will reduce when controlling for individualism. This is indeed the case, as illustrated by the fourth column in Table 6. All correlations decrease—some even become negative—and, except for the measure forbidding pedestrians to use headphones or earbuds on the street, none of the correlations is significant anymore. The difference in the values between the second and fourth columns in Table 6 shows the

**Table 6**
Pearson correlations between driving behaviour and support for policy measures (national level).*

| Behaviour over the last 30 days (at least once) | Install ISA systems | Install speed warning signs | Alcohol interlock for recidivists | Zero alcohol for novice drivers | Zero alcohol for all drivers | No use of mobile phones inside cars |
|---|---|---|---|---|---|---|
| Speeding in built-up areas | −0.704** | −0.596** | | | | |
| Speeding in rural areas | −0.682** | −0.593** | | | | |
| Speeding on motorways | −0.708** | −0.616** | | | | |
| Driving over the BAC limit | | | −0.255 | −0.047 | −0153 | |
| Driving after drinking alcohol | | | −0.291 | −0.053 | −0.481** | |
| Talking on hand-held phone during driving | | | | | | 0.084 |
| Reading messages while driving | | | | | | 0.120 |

* $p < 0.05$.
** $p < 0.01$.

**Table 7**
Pearson correlations between the expectation to be checked by the police and support for policy measures (national level).

| Expected to be checked by the police on a typical journey | Install ISA system | Install speed warning signs | Alcohol interlock for recidivists | Zero alcohol for novice drivers | Zero alcohol for all drivers | No use of mobile phones inside cars |
|---|---|---|---|---|---|---|
| For speeding | 0.365*** | 0.430* | | | | |
| For driving under the influence of alcohol | | | 0.425* | 0.230 | 0.122 | |
| For using hand-held phones | | | | | | 0.310 |

* $p < 0.05$.
** $p < 0.01$.

importance of national culture and, in particular, individualism, as a factor that is strongly related to support for policy measures.

To examine this phenomenon more closely, Table 8 shows the correlation between the percentage of people supporting the 15 ESRA measures and the updated values of the Hofstede dimensions of individualism and flexibility/long-term orientation. These results are based on 29 countries since for three of the 32 ESRA2 countries (Morocco, Serbia and Slovenia) no new Hofstede values are yet available.

As can be seen, there is a (very) strong negative correlation between 11 of the 15 policy measures and individualism and a strong correlation between 9 measures and flexibility. Overall, these results illustrate that national culture is a strong predictor of the support for road safety policy measures.

Table 8 also shows that the correlation coefficients between individualism and the support for measures are negative. This is not unexpected, given the variables on which the individualism construct is based. These cover aspects of conformism with question items '*1. I usually respect all rules and norms of my society, even those that I do not like.'; '2. I am somewhere in between these two.'; '3. I decide myself which social rules to respect.';* and '*1. If I could, I would make all people in our society follow all our laws and rules very strictly.'; '2. I am somewhere in between these two.'; '3. If I could, I would allow people to break useless or meaningless laws and rules.'* (see page 394 in [38]). Thus, the higher the level of individualism in a society, the higher the opposition against these measures.

### *4.5. Examples of the association between national culture and support for policy measures*

In the following paragraphs, we discuss briefly some results for four measures: (1) installation of ISA in all cars; (2) obligatory helmets for cyclists; (3) zero BAC limit for novice drivers; and (4) forbidding pedestrians from using headphones or earbuds when walking on the street.

The proportion of respondents who supported the compulsory installation of ISA in new cars appears to vary significantly by region. The ESRA2 data reveal that the support for ISA in new cars is much lower in Europe (60.8%) and North America (44.4%) than in Africa and Asia [15]. These regional differences may be due to differences in driving and speeding habits, belief in the effectiveness of the measure, preparedness to accept government intervention, and the perceived extent to which the measures would be enforceable by the police. However, the data available do not allow for testing such relationships. Nevertheless, we can examine the association between national culture and support for compulsory installation of ISA. Fig. 4 shows a scatter plot of the relationship between the installation of ISA systems and individualism, which indicates a very high negative correlation ($-0.782$, $p < 0.01$). Fig. 4 shows that the highest level of support is found in middle-income countries with a high degrees of collectivism. However, even when these countries are excluded, the strong negative correlation persists.

The next example is the obligatory helmets for cyclists. ESRA2 analyses [15] show that the support for this measure is fairly high in most countries, often with over two-thirds of the population supporting it. The support is even higher for the measure that all children should wear helmets while cycling, which is already implemented in several countries. The relation between individualism and support for obligatory helmets for cyclists is shown in Fig. 5. Here too, the higher the individualism in a society, the higher the opposition against the measure. The level of support for this measure is also remarkably high—particularly considering that such a measure exists in few countries and that in most countries, a large part or even the majority of cyclists do not wear helmets. The Netherlands is an outlier with extremely low support. In this regard, it is noteworthy that it scores the highest in individualism as well as has the world's highest number of cyclists per capita.

**Table 8**
Pearson correlations between national public support for policy measures and individualism and flexibility.

| | Individualism | | Flexibility | |
|---|---|---|---|---|
| | Correlation | Significance | Correlation | Significance |
| Alcohol interlock for recidivists | −0.539** | 0.003 | −0.229 | 0.233 |
| Zero alcohol for novice drivers | −0.256 | 0.181 | −0.281 | 0.140 |
| Zero alcohol for all drivers | −0.711** | 0.000 | −0.362 | 0.054 |
| Install ISA systems | −0.782** | 0.000 | −0.467* | 0.011 |
| Install speed warning signs | −0.828** | 0.000 | −0.580** | 0.001 |
| Seatbelt reminder for all seats | −0.586** | 0.001 | −0.480** | 0.008 |
| All cyclists wearing helmets | −0.615** | 0.000 | −0.635** | 0.000 |
| Children cyclists wearing helmets | −0.328 | 0.082 | −0.570** | 0.001 |
| PTW wearing helmets | −0.261 | 0.172 | −0.230 | 0.229 |
| Pedestrians wearing reflective material | −0.089 | 0.645 | −0.153 | 0.427 |
| Cyclists wearing reflective material | −0.411* | 0.027 | −0.462* | 0.012 |
| PTW riders wearing reflective material | −0.413* | 0.026 | −0.461* | 0.012 |
| No use of mobile phones inside cars | −0.500** | 0.006 | −0.360 | 0.055 |
| No use of headphones by cyclists | −0.424* | 0.022 | −0.264 | 0.167 |
| No use of headphones by pedestrians | −0.718** | 0.000 | −0.515** | 0.004 |

* $p < 0.05$.
** $p < 0.01$.

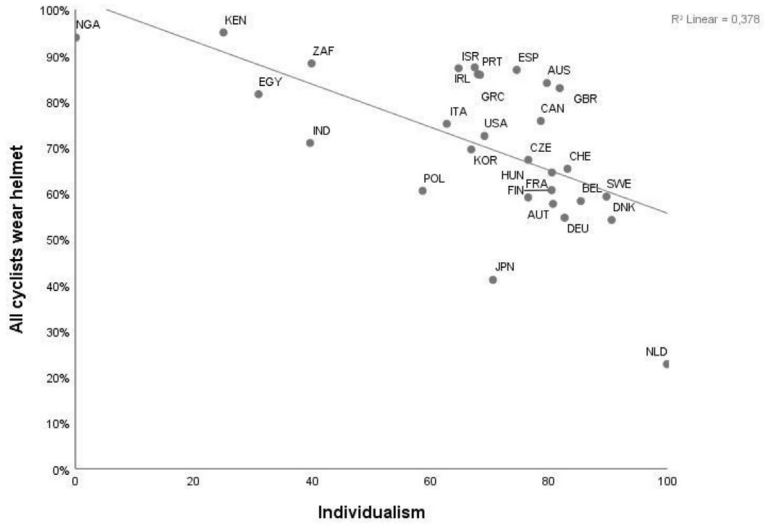


**Fig. 5.** Scatterplot of individualism versus 'all cyclists wearing helmets'.

According to ESRA2 data, almost half of the adult Dutch population rides on bicycles at least one to three days a week.

Thus, individualism is not the only national cultural characteristic that can explain the level of support for measures, and for some measures it is not even the most important one. For instance, based on a construct from ESRA data—the percentage of people almost never riding a bicycle—a negative relationship was found between the number of regular bicycle riders in a country and support for obligatory helmets for cyclists (see Fig. 6).

Fig. 6 illustrates that, in general, the lower the proportion of people in a country cycling regularly, the higher the support for helmet use. This supports the assumption that people who are barely affected by a measure are not often opposed to it. An additional explanation is that in countries with a lot of cyclists, the safety of cyclists is better (or at least perceived to be better) and these cyclists hence feel less the need to wear a helmet. Thus, cycling culture and cycling habits would be the key factors explaining the level of support for obligatory helmets for cyclists.

Next, let us consider a policy measure for which no significant correlation exists with individualism: 'Zero alcohol for novice drivers' (see Fig. 7). It should be noted that this legislation already exists in many countries (including most European countries) and that support for this measure is very high in most of them (except Italy). Because of these two phenomena, national culture is not a factor that appears to cause differences between countries in the support for that measure.

Where a measure is not yet implemented and the level of support varies, one can expect culture to play a more important role. To illustrate this, let us consider as a final example, the support for a measure that forbids pedestrians from using headphones or earbuds when walking on the street. In this case, the level of support varies more between countries, and the average level of support is much lower than that for 'zero tolerance for novice drivers'. Fig. 8 shows a negative association between the level of support for this proposed measure and flexibility (as well as individualism, not shown in the figure).

## 5. Discussion

This study has shown that differences in the support for policy measures between countries are largely associated with cultural differences, particularly the level of individualism. As expected, the resistance to

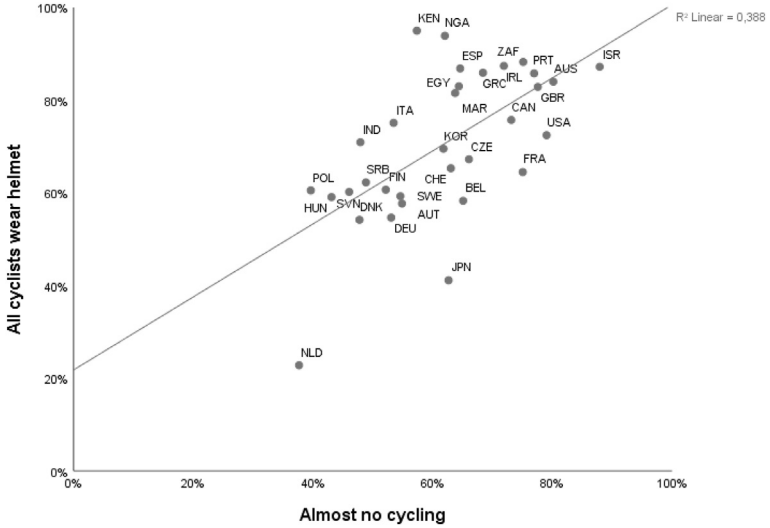


**Fig. 6.** Scatterplot of the relationship between the level of cycling and support for obligatory helmet use.

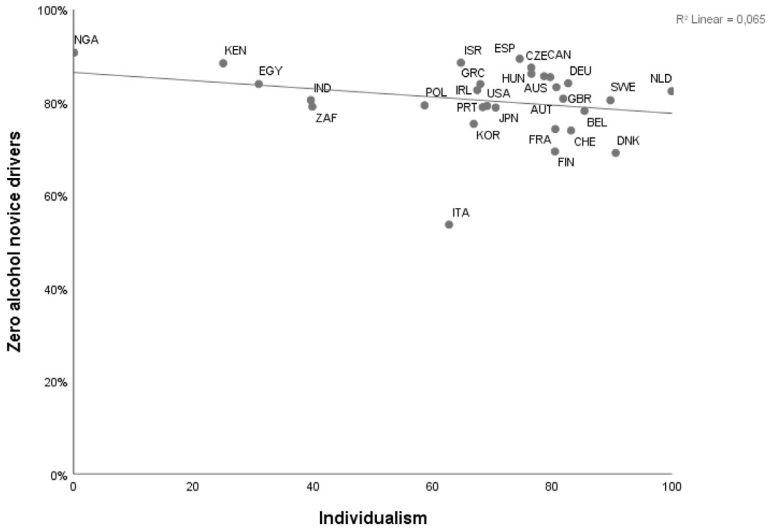


**Fig. 7.** Scatterplot of individualism versus 'zero tolerance for novice drivers'.

policy measures is higher in more individualistic countries. The impact of individualism also depends on the type of policy measure and other factors, such as the number of people affected, the expected benefits, the expected level of enforcement, and whether the measure is already in place.

Individualism, as a societal and not an individual characteristic, versus its opposite, collectivism, is the degree to which people in a society are integrated into groups [51]. People in individualistic societies are therefore less integrated into groups, which makes them have a more holistic view. They have a strong desire to determine by themselves which rules to follow (e.g. whether to wear a helmet) as well as to let others decide for themselves—as long as it does not affect them negatively. Collectivist societies on the other hand, do not place the onus of decision-making on individuals as they believe this would result in chaos. In individualistic societies, all the 15 proposed measures are perceived as an infringement of one or more individual human rights, and hence, it is fairly self-evident that opposition against such measures would be high. Yet, it seems paradoxical that despite their better road safety performance, the resistance against policy measures In road safety is higher in individualistic countries. We put forward a number of possible explanations.

First, our findings appear to support the logic that strong road safety performance reduces people's perceived need to improve road safety further and/or cause apprehension that the expected additional gains would come at an excessively high burden or cost. This would explain the negative association between the positive effects of the measures of the past (that led to fewer road casualties) and the perceived limited or too intrusive effects of new measures.

Another possible explanation arises from the observation that for most measures considered in this study, real-world public support is very high. In Europe, the average percentage of people supporting the 15 measures is over 70%. Thus, the social norm and predominant thought is that road safety is important, and there is a general willingness to accept policy measures which are expected to improve road safety. Even if a higher level of individualism diminishes support for such measures, the support is still sufficiently high for measures to get approved.

A third factor that could explain the association between good road safety performance and the resistance to road safety policy measures is linked to the relative importance of safety in different societies. The better road safety performance is found in countries with a more individualistic culture. A high score on individualism reflects a high number of

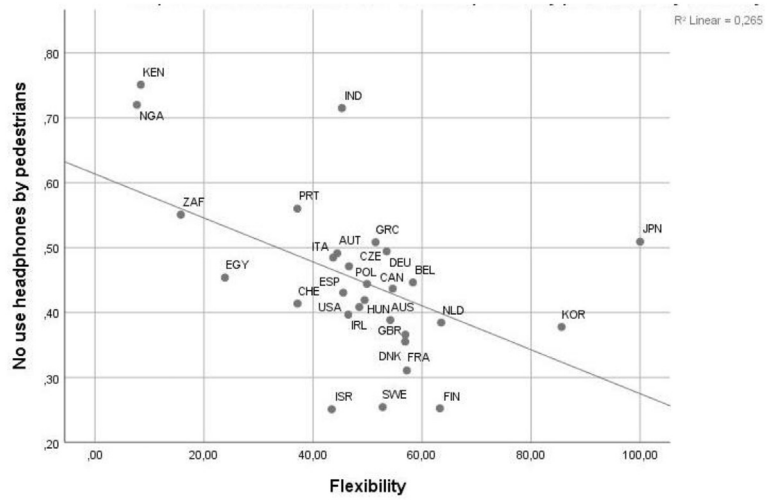


**Fig. 8.** Scatterplot of flexibility versus 'no use of headphones by pedestrians'.

autonomous and independent thinkers in a country. On the other hand, collectivist societies are centred on in-group cohesion (and less concerned about the society as a whole). Minkov [38] states in this regard:

> 'IDV [individualistic] societies are characterised by greater rule of law, which means universal application of rules and laws rather than discriminatory treatment of in-groups and out-groups. The fact that IDV societies have stronger enforcement of safety measures, and hence lower fatality rates in industrial and transportation accidents, reinforces this point: IDV societies have a greater concern for the rights and interests of all individuals, whereas COLL [collectivistic] societies show various degrees of neglect. The greater concern for punctuality in IDV society is also part of the same syndrome.'

Thus, people in individualistic societies, even if they are sceptical to new rules that may restrict their freedom, tend to take a more holistic view. They think of the whole society rather than only their in-group, which is generally more typical of collectivistic societies. They also trust other people to exercise good judgment and feel less need than their collectivistic peers to regulate society for avoiding chaos. As an example, it is no coincidence that in addressing the COVID-19 crisis, two of the three countries ranked highest on the individualism dimension (Netherlands and Sweden) were those that appealed most to people to practice self-restrictions rather than imposing restrictions through laws, and had, at one stage, the least drastic measures. This does not mean that laws are unnecessary, but once they become internalised in individualistic societies, they become less necessary and, in turn, so does enforcement. A good example is countries where seatbelts were introduced a generation ago: most people would continue to wear seatbelts even if it is no longer required by law. Another example is that in Scandinavian countries the need for control of drunk driving is lower than in a country like Belgium, because people are more disciplined themselves.

In more collectivistic societies with a focus on in-groups, unless there are severe control mechanisms in place (such as fines and police controls), people will often tend not to abide by new rules. Collectivist societies are conformist societies—they follow the rules of the society. However, the rules that are commonly followed are their traditional rules and not traffic rules, which are fairly new and not incorporated yet into the traditional culture.

It is noteworthy that in Fig. 4 the USA is almost an outlier, with low support for compulsory installation of ISA, despite being more collectivistic than many European countries, according to the new Hofstede model. This may appear surprising since the USA is generally known to be a libertarian country. The low support for ISA would normally suggest a highly individualistic society. A possible explanation is that one of the elements used by Minkov et al. [38] to measure individualism is religiousness – the more religious a society, the more it is collectivist. This element is the main contributor to the lower American individualism score, religion being much more widespread and practiced in the USA than in other highly developed societies. A tentative conclusion is that road safety attitudes might be more influenced by the other elements of the individualism-collectivism scale, and not so much by religiousness.

## 6. Conclusion

This study shows a strong correlation between culture, prosperity, and road safety performance of countries. Wealthier countries have fewer road fatalities per capita despite having larger car fleets and traffic volume than lower-income countries. Road safety performance is also related to the culture of a country. In particular, Hofstede's revised individualism-collectivism dimension can statistically explain over half of the variance between countries.

The current analysis shows that the relationship between culture and road safety performance is not merely due to the fact that growth in prosperity leads to cultural change, as this relationship is not simply a reflection of differences in wealth between countries. Countries that score highly on collectivism witness more road fatalities than those with a similar level of prosperity but higher individualism.

The results presented in this paper also illustrate that if the support for a policy is very high and differences between countries are small, cultural differences between such countries do not serve as a valid predictor of these small differences. However, if the level of support varies significantly across countries, one can often expect cultural differences to be a good predictor of the differences.

It was also found that the relationship between the proportion of traffic offenders in a country and public support for new measures is ambiguous. There is a negative association when it comes to speeding, some negative association in relation to driving under the influence, and no association when it comes to distraction. Similarly, the relation between the level of enforcement and the support for measures remains ambiguous, except in the case of speeding.

It was beyond the scope of the study to develop a theoretical model that can explain all the associations and cause-effect relationships. It is also not to be taken for granted that all associations can be fitted to a single model. Creating such a model will be challenging given the different nature of policy measures that can be envisaged. For instance, from the analysis undertaken it has become clear that the collectivistic nature of a society is related to the level of support for policy measures, but the strength of the association appears to vary considerably between policy measures.

## Declaration of Competing Interest

None.

## Acknowledgments

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- the Belgian Federal Public Service Mobility & Transport, for funding part of the ESRA design and data collection process; and, finally,
- Uta Meesmann (Vias Institute), Katrien Torfs (Vias Institute), and Carlos Pires (PRP, Portugal) for processing the raw ESRA data.

## Appendix A. Annex: List of countries involved in the correlation analyses

Table 9 lists all the countries involved in the correlation analyses. For all these countries, fatality rates and GNI (Gross National Income) values were taken from the WHO database [1].

**Table 9**
Countries involved in the correlation analyses.

| | | Correlation between | | | | | |
|---|---|---|---|---|---|---|---|
| | | National fatality rate *and* | | | | Policy support *and* | |
| | | Six old Hofstede dimensions | | | Two new Hofstede dimensions | Fatality rate | Individualism, flexibility |
| | | PD, I, M, UA[a] | LTO[b] | Indulgence | | | |
| Region: Europe | | | | | | | |
| ALB | Albania | x | x | x | | | |
| AUT | Austria | x | x | x | x | x | x |
| BEL | Belgium | x | x | x | x | x | x |
| BIH | Bosnia and Herzegovina | | | | | | |
| BGR | Bulgaria | x | x | x | | | |
| HRV | Croatia | x | x | x | | | |
| CYP | Cyprus | | | | | | |
| CZE | Czech Republic | x | x | x | x | x | x |
| DNK | Denmark | x | x | x | x | x | x |
| EST | Estonia | x | x | x | | | |
| FIN | Finland | x | x | x | x | x | x |
| FRA | France | x | x | x | x | x | x |
| GEO | Georgia | | | | | | |
| DEU | Germany | x | x | x | x | x | x |
| GRC | Greece | x | x | x | x | x | x |
| HUN | Hungary | x | x | x | x | x | x |
| ISL | Iceland | x | x | x | | | |
| IRL | Ireland | x | x | x | x | x | x |
| ITA | Italy | x | x | x | x | x | x |
| KAZ | Kazakhstan | | | | x | | |
| LVA | Latvia | x | x | x | | | |
| LTU | Lithuania | x | x | x | | | |
| LUX | Luxembourg | x | x | x | | | |
| MKD | Macedonia | | | | | | |
| MLT | Malta | x | x | x | | | |
| NLD | Netherlands | x | x | x | x | x | X |
| NOR | Norway | x | x | x | x | | |
| POL | Poland | x | x | x | x | x | X |
| PRT | Portugal | x | x | x | x | x | X |
| ROU | Romania | x | x | x | x | | |
| RUS | Russian Federation | x | x | x | x | | |
| SRB | Serbia | x | x | x | | x | |
| SVK | Slovakia | x | x | x | | | |
| SVN | Slovenia | x | x | x | | x | |
| ESP | Spain | x | x | x | x | x | X |
| SWE | Sweden | x | x | x | x | x | X |
| CHE | Switzerland | x | x | x | x | x | X |
| UKR | Ukraine | x | x | x | x | | |
| GBR | United Kingdom | x | x | x | x | x | X |
| Region: Asia | | | | | | | |
| BGD | Bangladesh | x | x | x | | | |
| BTN | Bhutan | x | | | | | |
| CHN | China | x | x | x | x | | |
| IND | India | x | x | x | x | x | X |
| IDN | Indonesia | x | x | x | x | | |
| IRN | Iran | x | x | x | | | |
| IRQ | Iraq | x | x | x | | | |
| ISR | Israel | x | x | | x | x | x |
| JPN | Japan | x | x | x | x | x | x |
| JOR | Jordan | x | x | x | | | |
| LBN | Lebanon | x | x | x | | | |
| MYS | Malaysia | x | x | x | x | | |
| MMR | Myanmar | | | | x | | |
| NPL | Nepal | x | | | | | |
| OMN | Oman | | | | | | |
| PAK | Pakistan | x | x | | | | |
| PHL | Philippines | x | x | x | x | | |
| QAT | Qatar | x | | | | | |
| SAU | Saudi Arabia | x | x | x | | | |
| SGP | Singapore | x | x | x | x | | |
| KOR | South Korea | x | x | x | x | x | x |
| LKA | Sri Lanka | x | x | | | | |
| SYR | Syria | x | x | | | | |
| THA | Thailand | x | x | x | x | | |
| TUR | Turkey | x | x | x | x | | |
| ARE | United Arab Emirates | x | | | | | |
| VNM | Viet Nam | x | x | x | x | | |

*(continued on next page)*

**Table 9** (*continued*)

| | | Correlation between | | | | | |
|---|---|---|---|---|---|---|---|
| | | National fatality rate *and* | | | | Policy support *and* | |
| | | Six old Hofstede dimensions | | | Two new Hofstede dimensions | Fatality rate | Individualism, flexibility |
| | | PD, I, M, UA[a] | LTO[b] | Indulgence | | | |
| Region: UCAN | | | | | | | |
| AUS | Australia | x | x | x | x | x | x |
| CAN | Canada | x | x | x | x | x | x |
| FJI | Fiji | | | | | | |
| NZL | New Zealand | x | x | x | x | | |
| USA | USA | x | x | x | x | x | x |
| Region: America | | | | | | | |
| ARG | Argentina | x | x | x | x | | |
| BOL | Bolivia | | | | | | |
| BRA | Brazil | x | x | x | x | | |
| CHL | Chile | x | x | x | x | | |
| COL | Colombia | x | x | x | x | | |
| CRI | Costa Rica | x | | | | | |
| DMA | Dominica | x | x | x | | | |
| ECU | Ecuador | x | | | | | |
| SLV | El Salvador | x | x | x | | | |
| GTM | Guatemala | x | | | | | |
| HND | Honduras | x | | | | | |
| JAM | Jamaica | x | | | | | |
| MEX | Mexico | x | x | x | x | | |
| PAN | Panama | x | | | | | |
| PER | Peru | x | x | x | x | | |
| SUR | Suriname | x | | | | | |
| TTO | Trinidad and Tobago | x | x | x | | | |
| URY | Uruguay | x | x | x | | | |
| VEN | Venezuela | x | x | x | x | | |
| Region: Africa | | | | | | | |
| AGO | Angola | x | x | x | | | |
| BFA | Burkina Faso | x | x | x | | | |
| CPV | Cabo Verde | x | x | x | | | |
| CMR | Cameroon | | | | | | |
| EGY | Egypt | x | x | x | x | x | x |
| ETH | Ethiopia | x | | | | | |
| GHA | Ghana | x | x | x | | | |
| KEN | Kenya | | | | x | x | x |
| LBY | Libya | x | x | x | | | |
| MWI | Malawi | x | | | | | |
| MAR | Morocco | x | x | x | | x | |
| MOZ | Mozambique | x | x | x | | | |
| NAM | Namibia | x | x | | | | |
| NGA | Nigeria | x | x | x | x | x | x |
| SEN | Senegal | x | x | | | | |
| ZAF | South Africa | x | x | x | x | x | x |
| TZA | Tanzania | x | x | x | | | |
| UGA | Uganda | | | | | | |
| ZWE | Zimbabwe | | | | | | |
| | Total | 96 | 83 | 77 | 51 | 32 | 29 |

[a] Power Distance, Individualism, Masculinity, Uncertainty Avoidance.
[b] Long Term Orientation.

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