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THE CONDITIONS OF RESPECT OF RULES IN YOUNG AND ELDERLY DRIVERS: AN EXPLORATORY STUDY

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Abstract

This study is concerned with the theoretical field of social representations and conditionality of norms. The aim is to study the perception of driving norms by structuring them around individual and group behaviours. We propose to evaluate driving conditionality with the questionnaire based on conditional scenarios. The tool has been proposed to 40 young drivers and 48 elderly drivers. Results show that the driving representation is conditional for the 2 groups, except with the scenario of wearing seat belt. The more conditional scenarios are the same for the 2 groups (scenarios of speed limit and amber light), with higher scores of conditionality for young drivers. The representation of the driving shows that with the system of legal norms (Highway Code), there is a system of social norms related to the actual practices of the users. This study illustrates an important aspect of road safety: the social perception of rules and its impact on driver behaviour.

Keywords: Social representations; Individual and group behaviours; Conditionality; Models of legitimate transgressions; Social norms; Driving.

Resumen

Este estudio se inscribe en el campo teórico de las representaciones sociales y de la condicionalidad de las normas. Se ocupa de la articulación de las prácticas individuales y grupales en la percepción de las normas de conducir, evaluando la condicionalidad vial por medio de un cuestionario basado en escenarios condicionales. El instrumento se ha distribuido entre 40 conductores jóvenes y 48 de tercera edad. Los resultados muestran que la representación de la conducta al volante es condicional en los dos grupos, con la excepción del escenario correspondiente al uso del cinturón de seguridad. Los escenarios más condicionales son los mismos para los dos grupos (escenarios ligados a la transgresión del límite de velocidad y del semáforo naranja), encontrándose las puntuaciones de condicionalidad más elevadas en el grupo de los sujetos jóvenes. La representación de la conducta al volante muestra al lado del sistema de normas legales (código de la circulación), la existencia de un sistema de normas sociales relacionado con las actuales prácticas de los usuarios. Este estudio ilustra un importante aspecto de la seguridad vial: la percepción social de las normas y su impacto en las prácticas del conductor.

Palabras clave: Representaciones sociales; Prácticas individuales y grupales; Condicionalidad; Modelos de transgresión legítimos; Normas sociales; Conducta al volante.

Introduction

Following the works of Moscovici (1976), several approaches of the social representations have been developed in social psychology. According to the central nucleus theory of social representations (Abric, 1976, 1987, 1994a, 1994b; Flament, 1987, 1989, 1994a, 1994b), social representation is organized around a system which includes a central nucleus and a periphery. The central nucleus of the representation is consensual and "no-negotiable" according to the terminology proposed by Moscovici (1993). The periphery of the representation is defined as being conditional, diversified and connected to the individual practices. The problematic of the social representations and norms is at the origin of the conditionality theory proposed by Flament (1989, 1994a, 1994b, 1999a, 1999b). This theory is concerned with the peripheral elements, which are defined as "schemas" (Flament, 1987), then as "prescribers" (Flament, 1994a) and finally as "norms" (Flament, 1997). In this study, we also use the term "rules" in the sense of "norms". In fact, the definitions of these two terms are very similar in French dictionaries. For example, in the "Littré" dictionary, the notion of norms refers to "Sometimes said for rule, law, according to which we have to guide". In the Larousse dictionary, this notion refers to "Rules for which we have to conform" (Larousse dictionary). In these dictionaries, the notion of rule refers to "prescription by virtue of the law, custom..." (Littré dictionary) or to "prescription which imposes itself on somebody in a given case; principle of behaviour, law" (Larousse dictionary). Some authors also speak of rules referring to the social rules they differentiate from the formal rules or legal rules (Verkuyten, Rood-Pijpers, Elffers, & Hessing, 1994).

The conditionality theory articulates the notion of prescription and the notion of condition: "generally we have to do this, but in certain cases (more or less clearly identified), we chose to do something else» (Flament, 1994a, p. 91). This theory can explain normative variations considered as legitimate transgressions because interpreted in the system itself (Flament, 1999a). This approach has important implications at the behavioural level since individual can adopt a particular behaviour which does not correspond to the generality of the observed behaviours, as soon as the conditional system justifies it. In this case, this behaviour is considered as a legitimate transgression in the social representation (Flament, 1994a, 1994b). Focusing on the legitimate transgressions of the traffic rules, Flament (1994b) showed nuances of the conditional

system. The results of his survey, with 36 young drivers aged from 22 to 45 years, revealed that the refusal to commit violations was rare and a large number of violations were associated with *pre-identified* conditions (e.g., "I take a one-way street if it is the night". According to Flament (p. 96): "this is not the badness of individual, but legitimate social situations, each time according to a very specific conditional system". Moreover, these studies showed that, from the discursive level, the prescriptions tend to emerge as "no-negotiable" or unconditional, the subjects referring to the general case "we must stop at a stop sign" and not individual cases related to the conditional system (Flament, 1994a). Hoping to reveal this conditionality, Gaymard (2006, 2007) has developed a questionnaire with different road scenarios and different road conditions that can "legitimize" the no respect of these scenarios. This questionnaire was given to 43 young drivers (mean age: 20 years). The results showed that the representation of the driving was highly conditional. Another main finding was that we can apprehend through the status of the scenarios a more or less "absolute" characteristic. For example, we observed an absolute respect of the rule for the scenario "seat belt wearing" (in the front seats of the car); all other scenarios were conditional in varied degrees. For example, we found that the "speed limit" scenario was the most conditional scenario. This finding corroborates previous studies showing a rejection of speed limitations by young drivers (Barjonet & Saad, 1986). The research presented here focuses on two normative systems, the system of legal norms (the Highway Code) and the system of social norms. This duality is also present in the works of Verkuyten et al. (1994) discussing rules (social) to break the formal rules (legal). They explored the usefulness of the concept of social representations to explore the beliefs and perceptions shared by law students. The authors observed an important consensus on the rules that must be obeyed and those which are acceptable to break. For example, respect the red light is not as appropriate at night when there is nobody and it is totally acceptable to break in case of emergency. Based on this work, Gaymard (2009) showed that the conditional transgressions of the traffic rules through individual practices refer to what the drivers find acceptable to transgress. For example, they further violate the speed limit because they think more acceptable to do it under certain conditions. Thus, there are shared beliefs regarding specific rules, depending on circumstances, that may be transgressed. These various studies show that the complexity of the normative aspects exceeds the dichotomy: central/consensus/unconditional and peripheral/heterogeneous/conditional. Indeed the status of the "prescriptions" can't be analysed "in an exclusive way".

Researches on the normative system of social representations reflect the existence of different models (Flament, 1999b) which may explain this complexity. The conditional variations may also respond to compensatory strategies. The use of Boolean algebra show that subjects can be “cons-normative” and minority on one aspect of the rule and compensate this behaviour as being “pros-normative” and therefore majority on another aspect (Flament, 2001; Gaymard, 2002).

Outside the domain of social representations, other works in the field of the driving have focused on the problem of young drivers greatly involved in road crashes (Sécurité Routière, 2006). This over-risk of mortality among young drivers is observed in all industrialized countries and the two factors usually cited to explain this over-risk of mortality are the age and inexperience. However, these two variables remain difficult to separate (Groeger, 2006; Groeger & Chapman, 1996). We can understand now that the over-exposure of young drivers with little experience results from the interaction of multiple factors among which we find -risk-taking (e.g., relation with psychotropics, danger, group, the organizing of parties, etc.) - lifestyle, and -the problem of aggressiveness (Assailly, 1997, 2001; Chliaoutakis et al., 2002; Finn & Bragg, 1986; Gregersen & Berg, 1994; Jessor, 1998; Lajunen & Parker, 2001).

Another group of drivers increasingly targeted is that of the elderly. The elderly have more serious accidents but less frequently and they don't use so often the means of rapid transportation (Sécurité Routière, 2006). Older drivers are overrepresented in certain types of accidents such as accidents at intersections (De Raedt & Ponjaert-Kristoffersen, 2001). According Pauzié (2003, p. 204): "older drivers are a population high-risk, for reasons mainly related to functional ability specific to this population ". The studies highlight the reduction and/or slowing of perceptual abilities, cognitive and motor skills related to age (Case, Hulbert, & Beers, 1970) to justify the high-risk status of elderly drivers.

The objective of this study is to articulate individual and group practices to the prescriptions of Highway Code, comparing young and old drivers. Starting from practices, we want to update the phenomena more or less consensual and more or less conditional at the representational level. We believe that conditionality may be one factor as well as risk taking or lifestyle among young drivers, or reduction of cognitive and sensory impairment in older drivers. In this theoretical field, previous research has shown the importance of conditional variations in young drivers (Gaymard, 2007,

2009). We hypothesize that these variations also exist among old drivers. Furthermore, the excessive mortality on roads among young motorists leads us to the hypothesis that younger people have a more conditional representation than the elderly.

Method

Measurement instrument

To analyze the road conditionality, we used a questionnaire based on conditional scenarios (Gaymard, 2007, 2009). It is a tool designed to identify situations that could justify non-compliance with Highway Code. The questionnaire consists of 8 conditional scenarios related to driving (e.g., “You sometimes take a one-way street if you live nearby”). The first 7 are specific (red light, amber light, speed limit, seatbelt, stop sign, one-way street and continuous white line). The latter is general and related to compliance with the rules of the road (“You comply with the Highway Code if...”). Each scenario includes between 12 to 22 conditional situations that must be evaluated on a Likert-type ordinal scale with 6 steps from full compliance or absolute respect (absolutely never) until the absolute transgression (absolutely all the time) through 4 intermediate steps (see appendix 1 for a more specific example). The different situations based on various circumstances such as infrastructure (e.g., you’re in town), time (e.g., It was late evening or at night, etc.). The questionnaire also allows the collection of demographic data (gender, age, education level) and related to driving (years of driving, accidents as driver) useful for intergroup comparisons.

Participants

The study population consists of 40 young subjects recruited among students of the University of Angers and 48 seniors enrolled in associations of older persons. The young subjects had a mean age of 20.43 years ($SD = 1.65$) and were holding the licence for 22.85 months ($SD = 20.05$). Elderly subjects had a mean age of 71.32 years ($SD = 7.43$) and were holding the licence for 41.73 years ($SD = 9.36$). People with neurological and/or psychiatric problem,¹ and occasional drivers were excluded from the study. The average number of reported crashes for the young subjects was 0.35 (SD

= 0.67). The average number of reported crashes for the elderly was 0.42 ($SD = 0.65$). Regarding the level of education, the responses were categorized on a scale² ranging from 0 (no diploma) to 6 (> second-year university level). The average youth group was 4.87 ($SD = 0.88$), the group's "old" was 2.77 ($SD = 1.69$).

Analysis strategies

These variables have been used for intra- and intergroup comparisons without taking into account gender issues since the behaviour of men was strictly comparable to women whatever the age group; results already observed in young people (Gaymard, 2007).

Results

Analysis with young drivers.

To test the effect of the type of scenario on the level of conditionality, an ANOVA using the mean score of conditionality as the dependent variable and the type of scenario as the independent intra-individual variable (red light, amber light, speed limit, stop, one-way street, continuous line, respect) was conducted. The "seatbelt" scenario was excluded from the analysis, given the lack of variability observed. This effect was significant, $F(6, 234) = 32.61, p < .0001$. We have broken this effect through a series of post hoc comparisons (t test for paired samples) with Bonferroni correction (.05/21; $p = .003$). These comparisons show that amber light scenario ($M = 2.84$) and speed limit scenario ($M = 2.91$) were significantly more conditional than all other scenarios.

Analysis with elderly drivers

The effect of type of scenario on the level of conditionality in the elderly has been tested with the same statistical procedure as used for young subjects. This effect is also highly significant, $F(6, 282) = 18.92, p < .0001$. The post hoc comparisons showed

¹ All the drivers had a neuropsychological assessment mainly focusing on general intellectual functioning and executive skills.

² Nomenclature proposed by the INSEE (National institute for Statistic and Economic Studies).

again that the amber light scenario ($M = 1.97$) and speed limit ($M = 2.09$) scenario were significantly more conditional than all other scenarios.

Comparison between young and elderly drivers

Comparisons of the 2 groups showed significant differences for 6 scenarios, the conditionality being higher among young drivers. The scenarios less conditional in the 2 groups (red light and seat belt) are not discriminatory (see Table 1).

Table 1. Comparisons (means and standard deviation) between young and elderly drivers on the eight scenarios.

Scenario	Young Mean/S.D.	Elderly Mean/S.D.	t(86)	p
Red light	1,57/0,60	1,57/0,52	0,009	ns
amber light	2,84/0,81	1,97/0,59	-5,827	.000
Speed limit	2,91/0,71	2,09/0,68	-5,497	.000
Seat belt wearing	1,06/0,30	1,15/0,48	1,060	ns
Stop sign	1,91/0,81	1,53/0,59	-2,524	.013
One-way street	1,74/0,77	1,44/0,52	-2,128	.040
Continuous line	2,06/0,86	1,58/0,56	-3,136	.002
Respect	1,99/0,57	1,53/0,56	-3,798	.000

Relations between demographic and accidentology variables, and scores of conditionality

We first analyzed the correlations between the average score of conditionality and demographic and accidentology variables of the questionnaire. Then we conducted an analysis of multiple linear regression step backward to isolate the demographic and accidentology factors that best explain the variance of conditionality scores. These tests were conducted on all the 2 groups. We seek more effective in clarifying the nature of possible links between these variables and the score of conditionality rather than show intergroup difference (difference already demonstrated in the analyses of variance). Moreover, the fact of considering the 2 groups together allowed us to strengthen the statistical power of our correlation analyses, especially given the few accidents reported

in the 2 groups. From the number of variables used in correlations analysis, we applied the Bonferroni correction.

Regarding the correlation analysis, it appears that especially the age and number of years of licence correlate negatively with most scores of conditionality, indicating that more the age and the number of years of licence increase, less the conditionality is important (see Table 2). We are seeing a significant influence of the number of years of education on the score of conditionality in the amber light and speed limit scenarios (more there is years of education, higher are the scores of conditionality).

Table 2. Significant correlations between demographic and accidentology variables, and conditionality scores.

Variables	Coefficient	p
Age/Amber light	-.523	.000
Age/Speed limit	-.530	.000
Age/Continuous line	-.309	.003
Age/Respect	-.355	.000
Level education/Amber light	+.322	.002
Level education/Speed limit	+.350	.000
Years of licence/ Amber light	-.502	.000
Years of licence/ Speed limit	-.492	.000
Years of licence/ Continuous line	-.309	.003
Years of licence/ Respect	-.420	.000

In regressions (multiple-step backward), the scores of conditionality of different scenarios were used as dependent variables and demographics and accidentology data were used as independent variables. The regressions confirm the impact of the age and number of years of licence on the variance of the scores of conditionality, these factors are often the only ones identified by the analysis to account for 6 to 28 % of the variance in scores of conditionality. The impact of the accidentology variable is very low (see Table 3).

Table 3. Significant results in regression analysis between demographic and accidentology variables and conditionality scores.

Dependant variable	Independent variable	R	B	R² (explained variance)	p
Amber light	Age	.52	-0.52	0.27	.000
Speed limit	Age	.53	-0.53	0.28	.000
Stop sign	Age	.25	-0,25	0.07	.01
	Accident	.34	-0,22	0.12	.006
One-way street	Years of licence	.24	-0.24	0.06	.030
Continuous line	Age	.31	-0.31	0.10	.003
Respect	Years of licence	.42	-0.42	0.18	.000

Discussion

The objective of this work was to study road conditionality among young and elderly drivers through the questionnaire based on conditional scenarios (Gaymard, 2007) involving different specific scenarios (red light, amber light, speed limit, seatbelt, stop, one-way street and continuous line) and a general scenario bounded to respect of the highway code. We were also interested in the relationship between conditionality and demographic or accidentology data involving drivers.

Starting from individual practices, we find that the perception of driving norms is highly conditional. As it has been demonstrated elsewhere in the field of study of social representations, the conditionality of the peripheral system promotes the expression of the normative aspects (Flament, 2001; Gaymard, 1999). Thus, the representation of the driving shows that with the system of legal norms (Highway Code), there is a system of social norms related to the actual practices of the users. The first established by the legislation may be conditional explicitly in the texts of law and the related social practices reflect the logic of users. According to C. Flament (personal communication, in September 17th, 2006), "social custom (more or less individualized) inform that, under certain conditions, the code is impractical". This research shows the stake in competition of two distinct normative systems in nature, but their understanding

requires the continual path from one to another. The legitimate transgressions appear as actual transgressions with the Highway Code, but at the same time, they refer to the legitimate behaviour in the field of social representations. Starting from practices and studying conditionality, we can access to the diversity but also to the consensus. Practices are linked to representations, the "unconditional" may highlight central aspects of representation. As already been observed in previous work (Gaymard, 2007), the scenario of seat belt wearing vouch for the integration of a formal rule in the representational system. We can say that in this case, there is no competition between the two normative systems. There are no circumstances justifying the no-wearing of seat belt. Therefore, this rule is no negotiable in the representation, but it concerns only the seatbelt in the front. Gaymard (2007) explains the absolute nature of this scenario by the fact that this rule is little restrictive and directly involves driver safety. All the transgressions proposed in this scenario, although varied (Gaymard, 2007), don't appear as legitimate in the representation.

Outside of this scenario, respect for other scenarios depends on circumstances more or less important which have an influence on the level of conditionality from one scenario to another. This variability is typical of the peripheral system of social representations. Thus, transgressions against the law are legitimate in the social representation although certain rules, such as the red light, seem less negotiable than others. These variations in the levels of conditionality are related to the fact that drivers find more circumstances to disregard the speed limit (e.g., to go to work, etc.) than the red light (Gaymard, 2007). We note, as well, that the status of some aspect in the representation is complex and ambiguous and does not allow adamant interpretation. There are no-negotiable and consensual prescriptions that could be central, but there are also prescriptions that may appear no-negotiable in a situation, and more or less conditional in another (Gaymard, 2007). In addition, we observe a consistence (to not say "consensus") in conditionality observed. Indeed, the young and elderly subjects evaluated in this study did not differ in the representation of the scenarios more conditional. For both groups the seat belt is the scenario most respected and the speed limit and the amber light, the scenarios the least respected. It seems so exist "models" of legitimate transgressions, that is to say that it is acceptable, under certain conditions, not stop at the amber light and not respect the speed limit. These results confirm the remarks of Verkuyten et al. (1994) who observed a consensus, not only on the rules that

must be obeyed, but also on those considered acceptable to transgress. Thus, the conditional system, beyond its variability, reflects a certain consistency that comes in our opinion, from the system and its contribution to overall performance.

These data are superimposed to those already obtained from young subjects (Gaymard, 2007). By cons, as expected, our results show that younger people are generally more conditional than the elderly because they have scores of conditionality significantly higher in six scenarios. We based this hypothesis on the existence of an over-representation with an over-mortality of younger people in road crashes. But in this work, the number of reported accidents is not higher with young compared to elderly drivers. On the other hand, the number of accidents seems little bounded to the scores of conditionality in our correlational and regression analysis. Conditionality in driving does not appear related to variables such as road crashes. However, in order to confirm this proposition, it should be important to use our tools with a population more involved in road crashes (habitual offenders, etc.).

Other explanations for these intergroup differences can be advanced and in particular the driving experience: the elderly are less conditional than young subjects because they have better integrated norms of the Highway Code. Correlation and regression results go in this right way. Age and years of licence are the most correlated or associated with scores of conditionality. Violations decrease when the age of driver increases, except perhaps in individuals whose educational level is higher because they are more conditional in amber light and speed limit scenarios. However, our population of elderly drivers is on average, less educated than the population of young drivers.

Another explanation may be proposed: the elderly, who feel themselves less efficient in driving due to a decrease of physical and cognitive abilities, could compensate the effect of age being more prescriptive with Highway Code, tending to absolute respect with regard to the Highway Code. Indeed, it is now well known that normal aging is accompanied by a number of declines changing driving ability, especially with a deterioration of vision and hearing, restrictions on movements head, neck and trunk, slower speed of information processing (Salthouse, 1996) and a decrease in attentional capacities (Gabaude, 2003; Marin-Lamellet et al., 2003). Following Lafont and Laumon (2003), all these declines are factors reducing the driving ability and increasing, correspondingly, the risk of accidents among the elderly. These authors have shown that the actual risk of accidents was significantly higher among the elderly compared with young subjects. Gruau, Pottier, Davenne, and Denise (2003)

have shown that sleepiness while driving is a current factor in car crashes and the primary cause of fatal accidents on French motorways, specially among the elderly. Several studies have also shown that healthy elderly subjects had a fairly good awareness of their perceptual and cognitive limitations and their impact on driving, which prompted them to restrict the use of their vehicle (Vance & al., 2006) to avoid certain driving situations considered more dangerous (driving on wet roads, driving in dense traffic, etc..) or perhaps more interesting in our problematic, they reduce their speed in traffic (Obriot-Claudel, Gabaude, & Marquié, 2005) or improve compliance with traffic rules (Yagil, 1998). Being more respectful with Highway Code, they could compensate their weakness or those of others. These «social self-regulation behaviours» should testify to the establishment, by the elderly themselves, of compensation mechanisms enabling them to preserve their independent mobility. In the same way, Marshall, Man-Son-Hing, Molnar, Wilson, and Blair (2007) have recently shown that the elderly were increasingly inclined to accept the same type of social regulation from outside (Ministry, Doctors, etc.), in the case of this idea was presented in a positive way. This idea of «preventing driving» has already been developed in work on the comprehensive study of road accidents in the elderly (Van Eslande, 2003). Nevertheless this interpretation would deserve to be confirmed by studying, for example, the variance of conditionality measures according to motor, sensory and/or cognitive performance (tests of processing speed, attention tests, executive tests, etc.), and/or the relation between two kind of measures: the awareness of physical disabilities or cognitive limitations (metacognition questionnaires, etc.) and the conditionality.

Works in the field of risk taking (Assailly, 1997, 2001; Byrnes, Miller, & Schafer, 1999) showed that males differentiate themselves significantly from girls in this area. The over-risk of young and adult male is present since many years (Assailly, 2001). In this study, we don't observe effect of the gender on the score of conditionality in both young and old groups. These results, already observed elsewhere, confirm the necessity to distinguish the conditionality from risk taking (Gaymard, 2007).

Beyond this discussion, it seems that eventually, an accurate identification of scenarios generating which generates conditionality and the impact of this conditionality on driving behaviours could help road safety professionals (representative of the law, trainers, etc.) to optimize their practices in the field of prevention. Furthermore a better understanding of «normative models» that govern road behaviour

could also facilitate the adjustment of the interventions from environmental and equipment specialists.

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Appendix 1 :**Questionnaire based on conditional scenarios.****Example of situations in red light scenario (Gaymard, 2007)**

You sometimes drive through a red light if :

- The red light is on a straight line and you have to turn to the right

1	2	3	4	5	6
Absolutely never	Never	Rather never	Rather all the time	All the time	Absolutely all the time

- You go on your workplace

1	2	3	4	5	6
Absolutely never	Never	Rather never	Rather all the time	All the time	Absolutely all the time

- You are alone

1	2	3	4	5	6
Absolutely never	Never	Rather never	Rather all the time	All the time	Absolutely all the time

- You arrive fast

1	2	3	4	5	6
Absolutely never	Never	Rather never	Rather all the time	All the time	Absolutely all the time

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