

## Determinants of the acquisition and utilization of automobile child restraint devices: a survey among Dutch parents

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### Abstract

On behalf of the Dutch Road Safety Association a survey of the use of child restraint devices (CRDs) in The Netherlands was conducted. In a population of 420 parents of children younger than 5 years old, 95% possessed at least one CRD, while 83% of the owners always, or most of the time, used a CRD when transporting a young child. It appeared that while the decision to buy a CRD was mainly determined by beliefs concerning safety and comfort provided by CRDs, the actual use of CRDs was determined primarily by the reaction of restrained children. Parents, once in possession of a CRD, seem to agree on the safety and comfort of CRDs. Not until they start using it do some parents find that their child responds irritably. For parents not using a CRD regularly, this seems to be the main reason for their behaviour. Another significant determinant, although less influential, appeared to be the perceived social influence of partners of the respondents and of road safety experts. The practical implications for health education include the recommendation to separately address parents who are already in possession of a CRD and parents who are not. Furthermore, some theoretical implications are discussed.

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### Introduction

Young children are relatively vulnerable in traffic. In 1989 in The Netherlands seven children younger than 5 years old died as passengers in automobile accidents, while about 200 children were injured (CBS, 1990). When transported in cars, babies and toddlers require suitable protective devices. Such devices have been shown to be very effective in preventing deaths and serious injuries. It is estimated that by using a device the risk of death or injury is reduced by a factor of 4 or 5 (Shaw and Fluke, 1983). Several of these child restraint devices (CRDs) are available. CRDs can be divided into four general types. For babies (0–9 months) a rear facing reclining seat can be used, as well as restrained carry cots. For toddlers (9 months–3 years) seats for the back seat of the car are available in which the child faces forward. For children older than 3 years two alternatives are available. The first is a booster seat, used in combination with standard seatbelts. The second device is a quadrangular seatbelt, attached to the back seat.

Little is known of the utilization of these devices in The Netherlands. In a study by Van Kampen (1984), 73% of the families with children younger than 5 years old reported using such a device. However, no validated information is available concerning the determinants of the use of CRDs by parents of young children in The Netherlands. From American studies, several determinants have emerged. It appeared that CRDs are bought and used more often by parents with a higher income, education and professional status (Philpot *et al.*, 1978; Eriksen and Gielen, 1983). The number and age of the children in a family are also of importance.

Babies and toddlers are protected more often than children aged 4 and older. Although the use of at least one CRD will become more likely when more young children are transported at the same time, the other children remain unprotected (Philpot *et al.*, 1978). Furthermore, parents frequently using seatbelts themselves are 3–4 times as likely to use CRDs for their children than parents not wearing seatbelts regularly (Philpot *et al.*, 1978; Eriksen and Gielen, 1983).

Apart from these general variables, some motives of parents for not using CRDs are assessed. Parents reported that use of a CRD is inconvenient for themselves and uncomfortable for the child. Some parents do not believe that CRDs provide extra safety, while others even believe CRDs are unsafe. Some parents believe that holding the child on the lap provides sufficient protection or, even, more protection than a CRD. Finally, parents reported that CRDs are expensive (Eriksen and Gielen, 1983).

The main purpose of this study, conducted in 1987 for the Dutch Association for Road Safety (Veilig Verkeer Nederland, VVN), was to assess the need for, and enable the development of, an effective health education program. Green and others have shown the importance of a systematic approach of health education, in which attention should be focused first of all on a diagnosis of the (health) problem, followed by the assessment and analysis of the behaviours related to the problem and the determinants of these behaviours. On the basis of these first two essential stages the educational program can be carefully designed, planned and executed, while the whole process is continuously evaluated (Green *et al.*, 1980; Kok and de Vries, 1989). This study, therefore, was designed to provide data for a behavioural diagnosis, establishing the main determinants to be changed and thus improving the potential effectiveness of the resulting program. A note of importance in this respect concerns the Dutch legal requirements on automobile restraints. Although since 1990 new automobiles are equipped with rear seatbelts, the use of restraints for rear seat passengers is not compulsory. Contrary to the UK, children in The Netherlands are not required to travel restrained as rear seat passengers, even when

restraints are present in the back of the car. This underlines the importance of assessing and influencing parents' own motivations. Another relevant fact is that loan schemes for baby seats have only existed in The Netherlands since 1990 and often still on an experimental basis. At the time of this study there were very few (if any) professionally organized loan schemes operational in The Netherlands.

For this study four research questions were formulated concerning the possession and utilization of CRDs.

- (1) How many of the families with young children in The Netherlands are in possession of a CRD?
- (2) How frequently are these devices used?
- (3) What are the determinants of CRD acquisition?
- (4) What are the determinants of the actual use of CRDs?

Parents of children younger than 5 years were selected as the target population. The reason for this age limit is that for children older than 5 years standard lapbelts or three-point-belts, both in combination with a booster seat, are appropriate so that special protective devices are unnecessary.

The research questions were operationalized using Fishbein and Ajzen's reasoned action model (Ajzen and Fishbein, 1980), a theory widely used to assess quantitatively behavioural motivations (Ajzen, 1985; de Vries *et al.*, 1988). In this model a specific behaviour is directly determined by the individual's intention to perform that behaviour. This *intention* in turn is determined by two variables. The first is a person's *attitude* towards performing the behaviour, which is formed by considering and weighing all possible consequences of the behaviour in terms of probability ('beliefs') and appraisal ('evaluations'). The second variable consists of the perceived norms of relevant others towards performing the behaviour in question ('normative beliefs') and the person's inclination to comply with these perceived norms ('motivation to comply'). Together, these two aspects form the *subjective norm*. According to this model, background variables, such as age, sex and other demographic variables or personality traits, are considered as

external variables, determining behaviour only indirectly through the attitude and subjective norm.

### Method

A list of consequences of the utilization and acquisition of CRDs was made on the basis of a literature study and interviews with 12 parents of young children. This resulted in 20 consequences of CRD utilization and acquisition, each represented by a belief and an evaluation item (see Table I). These consequences involve the following aspects of CRD utilization: safety, the child's comfort, the convenience of fastening and the response of the fastened child. Two consequences were exclusively relevant to CRD acquisition (expensive purchase and short period of use). The consequences of CRD utilization were expected to be relevant for both

utilization and acquisition, and were therefore used in the analysis of both behaviours. Considering the limited possible length of a written questionnaire, though, these consequences were formulated as consequences of CRD utilization only, and not for both behaviours separately. It was assumed that this inconsistency would not seriously affect the validity of the analysis of CRD acquisition determinants.

For the assessment of the social norm six (groups of) relevant others were selected, including the partner, close relatives, good friends, acquaintances, neighbours and road safety experts (see Table II).

The questionnaire included some demographic variables, including the respondents' income, level of education, age, sex, and the number and age of the children. Furthermore, in cooperation with experts of the VVN, items were formulated in order to obtain a more detailed assessment of possession

**Table I.** Consequences of CRD utilization: differences between owners (O; N=398) and non-owners (NO; N=21) on beliefs, evaluations and the products of these variables (belief: 1 = disagree with consequence, 5 = agrees with consequence; evaluation: +2 = consequence is good/pleasant, -2 = consequence is bad/unpleasant)

	Belief		Evaluation		Products B·E	
	NO	O	NO	O	NO	O
Consequence of utilization						
1. Safer on long trips	3.10	4.85**	1.67	1.91	5.33	9.38***
2. Safer at high speed	3.57	4.76*	1.67	1.93	6.38	9.20**
3. Safer at low speed	3.19	4.83**	1.62	1.88	5.38	9.09**
4. Safer on short trips	3.38	4.82**	1.62	1.85	5.76	9.01**
5. Safer in general	3.67	4.73*	1.81	1.92	6.57	9.07*
6. Child has more support	3.43	4.42*	1.24	1.72*	4.38	7.74**
7. Child has better sit	3.10	4.06*	1.33	1.70	4.48	7.11***
8. Child has better view	2.24	3.69***	1.48	1.65	2.86	6.24***
9. Unsafer when car on fire	3.48	3.60	-1.38	-1.59	-4.29	-5.65
10. Child becomes quiet	2.14	3.05**	1.62	1.87	3.48	5.72**
11. Unsafer when car hits water	2.95	3.18	-1.14	-1.55	-2.86	-4.81
12. Safer when car hits water	0.81	2.49*	1.52	1.69	2.67	4.40*
13. Safer when car on fire	0.33	2.03*	1.52	1.67	1.90	3.53**
14. Child becomes restless	1.81	1.77	-1.48	-1.69	-2.86	-2.98
15. Fastening CRD troublesome	1.90	2.25	-1.33	-1.22	-2.76	-2.79
16. Fastening child troublesome	1.76	1.98	-1.48	-1.17	-2.71	-2.42
17. CRD takes up room in car	2.67	3.40	-0.48	-0.54	-1.76	-2.04
18. Child has less elbowroom	2.62	3.42*	-0.33	-0.09	-1.19	-0.27
Consequence of buying						
19. CRD purchase is expensive	3.76	3.90	0.33	0.21	0.76	0.73
20. Short usage period CRD	3.43	3.51	-0.38	-0.55	-1.67	-2.09

\* $P < 0.05$ ; \*\* $P < 0.01$ ; \*\*\* $P < 0.001$ .

**Table II.** The subjective norm for CRD utilization: differences between owners (O; N=398) and non-owners (NO; N=21) on normative beliefs, motivation to comply and the products of these variables (normative belief: +2 = referent beliefs that respondent should certainly use CRD, -2 = referent beliefs that respondent should not use CRD; motivation to comply: 4 = respondent complies strongly with referent, 0 = respondent does not comply with referent)

Referent	Normative belief		Motivation to comply		Products N·M	
	NO	O	NO	O	NO	O
1. Partner	0.81	1.85**	3.00	3.49	3.10	6.55**
2. Experts	1.52	1.92*	2.86	3.37	5.05	6.43*
3. Family	0.67	1.50**	1.81	1.86	2.05	3.10
4. Best friends	0.43	1.38***	1.57	1.74	1.33	2.69*
5. Acquaintances	0.43	1.15***	1.48	1.40	1.14	1.93
6. Neighbours	0.67	0.99	1.24	1.22	1.05	1.67

\* $P < 0.05$ ; \*\* $P < 0.01$ ; \*\*\* $P < 0.001$ .

and utilization of CRDs. Using these items, information was gathered concerning the type and number of CRDs, the frequency with which the children were transported by car, and the frequency of utilization when transporting one or more children in the car. Some questions were included concerning the car used (ownership, cost) and the utilization of seatbelts by the respondents themselves.

In all, 950 questionnaires were distributed throughout The Netherlands via 19 local infant welfare centres. These were selected on the basis of two criteria: an optimal geographical spread and the representation of centres located in areas with different grades of urbanization. At each centre 50 questionnaires were handed out to visiting parents by care givers, accompanied by a postage paid return envelope. The care givers were asked to hand out questionnaires randomly and to avoid a selective approach. The parent transporting the child(ren) by car most often was asked to fill out the questionnaire.

Analyses were made using the Statistical Package for Social Sciences, version X (SPSS Inc.).

## Results

This section details the population, the utilization and possession rates of CRDs, the behavioural determinants, and the external variables.

### Respondents

Of the 950 distributed questionnaires, 420 were returned (44%). The majority of these responding

parents appeared to be mothers (76%), who were practically all married or living with a partner. Geographically, the population was well distributed throughout The Netherlands. With respect to the level of education, however, it appeared that respondents with higher education were considerably over-represented with 33% of the sample compared with the national average of 18% (CBS, 1985). This high percentage was accompanied by an under-representation of the lower educated: 1% of the sample compared with the national average of 17%. With regard to the children of the families in this sample, all age groups were sufficiently represented. It appeared that in half of the participating families a child younger than 1 year old was present (51%). Children of 1, 2, 3 and 4 years of age were all present in at the most one-third (37%) to at least one-fifth (20%) of the families in this study.

### Possession and utilization of CRDs

A small number of parents (5%) indicated not owning a CRD. Of the remaining 95%, approximately half owned just one CRD, the other half owned two or more. Seats for children aged 9 months–3 years old were the most frequently mentioned devices: 77% of all respondents owned at least one of these. Of the parents, 15% owned a baby seat, designed for children 9 months or younger. Finally, booster seats were mentioned by only 6% of the parents.

The majority of parents indicated that they regularly (i.e. more than three times a week)

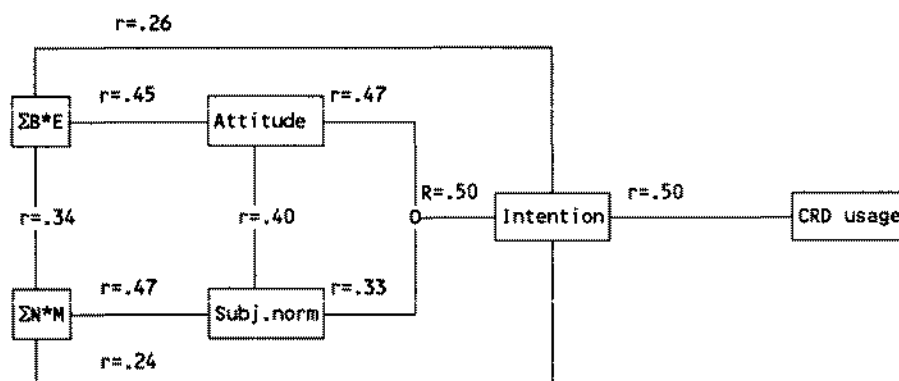


Figure 1. Multiple regression analysis of the theoretical model ( $n=419$ ). All correlations are significant at the level of  $P<0.01$ .  $\Sigma B^*E$  represents the indirect attitude, and likewise  $\Sigma N^*M$  represents the indirect subjective norm.

transported their child(ren) by car (57%), usually in their own car (96%). When asked how often a CRD was used when transporting a child younger than 5 years old, 83% of the parents possessing one or more CRDs indicated using a CRD at all times (65%) or most of the time (18%). The remaining parents only sometimes made use of a CRD when transporting one young child (11%) or never (5%). When transporting two young children at the same time, utilization of a CRD for both children becomes less frequent. In this situation, 55% of the parents possessing at least two CRDs indicated that they always (38%) or most of the time (17%) use two CRDs.

Another, possibly relevant, factor is the use of seatbelts by the parents themselves. More than half of all parents (56%) indicated that they always use their seatbelts; a further 23% indicated that they use them most of the time. One-fifth of the respondents (21%), then, indicated they use their seatbelts only occasionally or never.

### Behavioural determinants

This subsection, in which the analysis of the behavioural determinants is reported, consists of three parts. In the first part attention is paid to the explanatory power of the theoretical concepts, followed by the second part, in which differences between CRD-owning parents and non-owning parents are examined, while in the third part differences between users and non-users are examined. These differences were assessed using  $t$ -tests on

beliefs, evaluations, normative beliefs and motivation to comply. For the analysis of CRD acquisition the sample was divided into 'owners', i.e. parents possessing one or more CRDs ( $N=398$ ), and 'non-owners', i.e. those not possessing any CRDs at all ( $N=21$ ). Note that all parents in possession of at least one CRD, regardless of whether they bought it themselves or acquired it by other means, were considered as owners. Simultaneously, for the analysis of CRD utilization, 'users', i.e. parents reporting that they always or mostly used a CRD when transporting a young child ( $N=327$ ), and 'non-users', i.e. parents reporting that they only sometimes or never used their CRD ( $N=63$ ), were distinguished.

The explanatory power of the theoretical model and the relative importance of each of the determining factors was assessed in a multiple regression analysis. For both attitude and subjective norm a direct as well as an indirect measurement was included; the direct measurement serving as a validation of the indirectly assessed determinant. The indirect attitude towards utilization was formed by adding up all products of beliefs and evaluations, resulting in an index of 18 items. The direct measurement consisted of an index of two scales, representing the most important dimensions of the attitude: how good/bad and how pleasant/unpleasant the use of CRDs was considered. Likewise, the indirect subjective norm was constructed by adding the products of normative beliefs and motivation to comply for six (groups of) referents. The direct subjective norm

consisted of one dimension, indicating to what extent the respondents believed that most people, important to them, thought they should use a CRD. Note that no reliability tests, like Cronbach's alpha, were made for these summated variables. From a theoretical point of view these indices are expected to be multidimensional and, therefore, not to be internally consistent. Both the indirect and the direct attitude and subjective norm were used as predictors, and the behavioural intention to use a CRD as criterion. The results of this analysis are shown in Figure 1.

It appears that the total explained variance in the intention to use a CRD comes to 25% (multiple  $R=0.50$ ;  $P<0.001$ ). The intercorrelations illustrate that the attitude correlates higher with the behavioural intention than the social norm. This accounts for the direct as well as the indirect measures of these variables. Furthermore, it appears that both direct measurements have more explanatory power than the indirect measurements. This finding is consistent with the theoretical prediction that the direct measurements represent the overall attitude and subjective norm, and are therefore more closely related to the behavioural intention. The indirect measurements can only partially cover these direct variables. Not only is it unlikely that the lists of beliefs and normative beliefs are exhaustive, but also one may expect that by summing and averaging all beliefs and all normative beliefs to two single scores, explanatory power will decrease.

The differences between CRD owners ( $N=398$ ) and non-owners ( $N=21$ ) on their attitude towards CRD utilization and acquisition are reported in Table I. In spite of the rather small number of non-owners in this sample, many of the measured consequences show highly significant differences in beliefs and products. Most of the evaluations, though, are equal for both groups. Owners are clearly more convinced than non-owners that use of a CRD improves the safety of the child. This accounts for both safety in general and for specific situations, like long and short trips or high and low speed. Simultaneously, some other advantages for the restrained child, like a better sitting position, more support and a better view, are more strongly subscribed to by these

owners. Moreover, they are more convinced that the child will become quiet when fastened.

Furthermore, parents owning a CRD believe more strongly that use of a CRD improves the child's safety in accidents in which the car hits water or catches fire. Nevertheless, according to the ranking order of the mean scores on these items, which gives an indication of how strongly the consequences contribute to the final attitude, even these owners appear to believe that CRDs will rather be more dangerous than safer in these situations. Another interesting result, according to Table I, is that consequences concerning 'user-friendliness' play no significant role in the decision to buy a CRD or not. Neither fastening of the child nor the limitation of space in the car was judged differently by both groups. Finally, two consequences of the acquisition of a CRD, the high cost and the relatively short period of use, revealed no significant differences between owners and non-owners.

When looking at the subjective norm for owners and non-owners, as can be seen in Table II, the respondents' partner appears to be the most important referent, followed by experts and best friends. For these referents the mean scores of owners on the products of normative belief and motivation to comply were significantly higher than the scores of the non-owners. Although owners appear to have more positive normative beliefs for all referents, except for their neighbours, than non-owners, there were no differences in their motivation to comply with these referents.

For the analysis of the determinants of CRD utilization, users were compared with non-users, selecting the owners of one or more CRDs ( $N=390$ ). When looking at their attitude towards the utilization of CRDs, as shown in Table III, it appears that only two products of belief and evaluation are significantly different. These are the belief that the child becomes (more) quiet when restrained, which is more strongly held by users, and the opposite belief that the restrained child becomes restless, which is subscribed to significantly more often by non-users. Although several of the other consequences show significantly different beliefs, this does not account for the

**Table III.** Consequences of CRD utilization: differences between users (U; N=327) and non-users (NU; N=63) on beliefs, evaluations and the products of these variables (belief: 1 = disagrees with consequence, 5 = agrees with consequence; evaluation: +2 = consequence is good/pleasant, -2 = consequence is bad/unpleasant)

Consequence of utilization	Belief		Evaluation		Products B·E	
	NU	U	NU	U	NU	U
1. Safer on long trips	4.79	4.88	1.90	1.91	9.19	9.32
2. Safer at high speed	4.81	4.76*	1.89	1.93	9.17	9.22
3. Safer at low speed	4.78	4.85	1.83	1.88	8.75	9.18
4. Safer on short trips	4.76	4.84	1.86	1.85	8.89	9.06
5. Safer in general	4.62	4.76	1.84	1.93	8.63	9.17
6. Child has more support	4.24	4.64	1.63	1.73	7.22	7.85
7. Child has better seat	3.73	4.14*	1.62	1.72	6.43	7.28
8. Child has better view	3.43	3.74	1.67	1.64	5.84	6.32
9. Unsafer when car on fire	3.84	3.55	-1.56	-1.62	-6.21	-5.63
10. Child becomes quiet	2.67	3.13*	1.83	1.88	4.87	5.91*
11. Unsafer when car hits water	3.46	3.13	-1.49	-1.57	-5.24	-4.80
12. Safer when car hits water	2.14	2.60*	1.81	1.69	3.89	4.59
13. Safer when car on fire	1.81	2.09	1.71	1.69	3.21	3.65
14. Child becomes restless	2.33	1.67**	-1.76	-1.68	-4.00	-2.78**
15. Fastening CRD troublesome	2.67	2.17**	-1.22	-1.23	-3.56	-2.65
16. Fastening child troublesome	2.44	1.88**	-1.10	-1.19	-2.71	-2.36
17. CRD takes up room in car	3.69	3.43	-0.75	-0.51	-3.02	-1.93
18. Child has less elbow room	2.60	3.39	-0.22	-0.07	-1.00	-0.14

\* $P < 0.05$ ; \*\* $P < 0.01$ ; \*\*\* $P < 0.001$ .

accompanying evaluations or the products of both. This indicates that some of these differences in beliefs are compensated for or nullified by the evaluations when multiplied.

An aspect of CRD utilization which is not revealed in this analysis, is that the use of seats for babies may have different consequences than the use of seats for small children (from 9 months to 4 years old). Since these two types of restraints are attached differently to the car seat, and since the child is fastened differently into each type of CRD, one may expect differences in beliefs (and evaluations) between parents of babies and parents of small children. This was examined by comparing parents only having a baby ( $N=74$ ) with parents only having small children ( $N=329$ ). This showed that for two consequences these groups have significantly different scores on the product of belief and evaluation. Firstly, parents of small children perceive the better view afforded the child as a more important advantage than parents of a baby ( $t = -2.21$ ;

$P < 0.05$ ). Secondly, parents of small children report more often having trouble keeping their restrained child calm ( $t = 2.97$ ;  $P < 0.01$ ).

In addition to the use of one CRD when transporting one young child, an analysis was made of the use of two CRDs simultaneously. Parents performing this behaviour always or most of the time when transporting two young children ( $N=113$ ) were compared with parents doing this only occasionally or never ( $N=39$ ). For this analysis only parents with two or more young children and with at least two CRDs were selected. The results of this analysis are comparable to those of the use of one CRD in that the reaction of the children placed in CRDs seems to be the main determining factor. As would be expected, though, it appears that when using two CRDs the disadvantage of the space used in the car and the trouble of fastening a CRD also become significant determinants.

The analysis of the subjective norm for the utilization of CRDs, consisting of the normative

**Table IV.** The subjective norm for CRD utilization: differences between users (U; N=327) and non-users (NU; N=63) on normative beliefs, motivation to comply and the products of these variables (normative belief: +2 = referent beliefs that respondent should certainly use CRD, -2 = referent beliefs that respondent should not use CRD; motivation to comply: 4 = respondent complies strongly with referent, 0 = respondent does not comply with referent)

Referent	Normative belief		Motivation to comply		Products N·M	
	NU	U	NU	U	NU	U
1. Partner	0.82	1.93*	3.10	3.42**	5.80	6.64**
2. Experts	1.37	1.93***	3.41	3.48	4.94	6.69***
3. Family	1.10	1.56***	1.05	2.80	2.76	3.13
4. Best friends	0.96	1.44***	1.95	1.68	2.41	2.69*
5. Acquaintances	0.89	1.18***	1.68	1.33*	2.06	1.84
6. Neighbours	0.89	1.00	1.48	1.15*	1.88	1.57

\* $P < 0.05$ ; \*\* $P < 0.01$ ; \*\*\* $P < 0.001$ .

beliefs and motivation to comply of users and non-users, is shown in Table IV. Although normative beliefs for all referents, except for neighbours, show significant differences between users and non-users, the multiplication of these with the motivation to comply results in only two significant products. The partner and experts appear to be of importance, when looking at the subjective norm of CRD utilization, in that users perceive a stronger influence towards using a CRD by these referents than non-users.

### External variables

In addition to the above analysis of behavioural determinants attention was paid to demographic and other variables, in the theoretical model considered as 'external variables'. Two of these external variables appeared to be of interest in this respect. Firstly, the education level, which was higher for this sample than for the comparable Dutch population, appeared to be positively correlated with CRD utilization: Pearson's product moment correlation coefficient  $r = 0.14$  ( $P < 0.05$ ). This implies that the validity of the reported utilization frequency (and possession rate) might have been affected by this selection bias. Furthermore, after controlling for attitude and subject norm, education was still partially correlated with CRD utilization: partial  $r = 0.17$  ( $P < 0.01$ ). A similar result was found for the utilization of seatbelts by parents themselves. This variable appeared to be positively correlated with CRD utilization ( $r = 0.14$ ;  $P < 0.01$ ), while the partial correlation was only slightly lower: partial

$r = 0.11$  ( $P < 0.05$ ). It thus appears that two external variables, education level and parental seatbelt utilization, which are expected to determine CRD utilization indirectly through attitude and subjective norm, also have some direct, partial, association with the dependent variable. Theoretically, this indicates that the behavioural determinants in the model do not account completely for the influence of these external variables. This suggests that the constructed attitude and/or subjective norm were not complete, as a result of missing or invalid items. Other external variables, such as those concerning the responding parents (age, sex, income), their children (age, sex, number), the car used (cost, ownership, frequency of utilization) and the CRD (the way it was acquired), were not found to be significantly correlated with the use of CRDs.

### Discussion

A fairly high number of respondents reported possessing at least one CRD (95%), while 83% of this group reported using a CRD regularly or always. These percentages, though, may have been affected by a selection bias, whereby higher educated parents were over-represented in the sample. Another source of this bias may have been the use of self-reports. The possession and utilization rates, therefore, will probably be somewhat lower for the national population—a hypothesis confirmed by other Dutch research. Furthermore, the utilization of two CRDs for the protection of two young children transported



at the same time was considerably lower with 55% of the respondents reporting they did this regularly or always. A practical reason for this lower utilization rate is that when a third or fourth child (or adult) is transported, the use of two CRDs may well become difficult or impossible. This supposition is supported by the fact that two practical disadvantages of CRD utilization, i.e. the reduced space and the trouble of fastening, only then become significant when the use of two CRDs is concerned. Due to the earlier mentioned biases, however, this utilization rate too may be somewhat inaccurate.

Multiple regression analysis of the theoretical model revealed a somewhat lower proportion of explained variance in the intention to use CRDs. Combined with the partial correlations between CRD utilization and both education level and seatbelt utilization, this may indicate that the constructed behavioural determinants are incomplete and could be improved. Despite this limited proportion of explained variance, analysis of differences in determinants between CRD owners and non-owners, on the one hand, and users and non-users, on the other, generated some interesting results. The comparison of determinants of CRD possession and utilization clearly suggests that these two behaviours need to be addressed separately. When looking at the attitude, the decision to acquire a CRD seems to be mainly determined by safety considerations. On virtually all safety consequences parents possessing a CRD scored significantly higher than non-owners. Consequences concerning the child's comfort, neither the (in)convenience of utilization for the parents nor the financial costs of buying are of importance in this respect.

CRD utilization, however, seems to be mainly determined by the response of the restrained children: they can become more tranquil or, on the contrary, more restless and annoying when restrained in a CRD. This suggests that safety is the most important aspect when deciding whether or not to buy a CRD, implying that both users and non-users, once they are in possession of a CRD, are already convinced of this aspect. It is only after they start using a CRD when parents experience the (negative) reaction of their child, which may become an important barrier

for regular use to some of these parents. This is particularly true for parents of children older than 9 months. It seems that babies are more used to being restrained than older children. Since babies are in general less mobile than toddlers, they will probably feel less restrained when fastened in a CRD.

Of course these analyses need to be interpreted with some care as well, taking into account the possible bias of selective response and the limited explanatory power of the indirect attitude in this determinant model, as presented in Figure 1.

A theoretical implication of this result concerns the role of variables affecting the ability to perform a behaviour, in addition to motivational variables, such as attitudes and social norms. A recent trend in the research of behavioural determinants is the incorporation of variable such as self-efficacy (Bandura, 1986) into motivational models (de Vries *et al.*, 1988). Although in this study some of these ability-oriented aspects are in fact present, such as in beliefs concerning the time and effort needed to instal the CRDs and to fasten the children as well as the response of the fastened child, no explicitly formulated self-efficacy items were included in the questionnaire. The fact that utilization seems to be mainly determined by a more practical barrier may suggest that self-efficacy plays a considerable role in this case. The limited explained proportion of the variance in CRD utilization by this theoretical model further supports this thought.

Apart from attitude, the subjective norm also appears to be of some importance. The perceived social influence on both CRD utilization and acquisition is primarily exerted by the partners of the respondents and by road safety experts, which suggest that VVN might serve as an influential source of information.

These results illustrate the importance of clearly distinguishing behaviours when assessing the determinants of these behaviours, even where (seemingly) closely related behaviours are concerned. In this case, parents who (still) do not possess a CRD require a message focused on the safety aspects of CRD utilization. Parents who already have acquired a CRD but are not using it regularly, though, will probably not be affected by more information on

safety. For this target population attention should be focused on their problems with the response of their children fastened in a CRD. This may require further study of the causes of the behaviour of the children in CRDs which might, for example, lead to recommendations for the adaptation of the available CRDs. Otherwise it should result in better instructions for use, consisting of more relevant and concrete tips, improving parents' ability to calm their restrained children. Parents of babies should be prepared for a growing resistance of their child to being restrained as it gets older, so that they will be able to deal with it more effectively. Professionally organized loan schemes, which have recently become more frequent in The Netherlands, may provide a suitable way to provide these instructions, especially when located at local infant welfare centres, which are visited by virtually all parents with young children.

Further, an additional, more comprehensive study on the behavioural determinants may be useful. Such a study will probably require a more extensive, qualitative assessment of possible determinants, including specifically more skills oriented aspects. An effective method in this respect may be focus group interviews, in which a small group of parents, unacquainted with one another, is interviewed in a semi-structured way, focusing on CRD utilization (for more information on this subject, see Basch, 1987).

Finally, the need for systematically developed health education programs in general is underlined once more. The results of this study illustrate that in a carefully planned program, including a thorough behavioural diagnosis, superfluous or even counter-productive messages can be avoided, while important unforeseen aspects may be revealed.

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