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A longitudinal study of the impact of an environmental action

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In a previous study, we investigated the impact of an awareness-raising campaign on the behaviour of secondary school children in the Centre Region of France, regarding the recycling of used batteries. But, was it a question of pro-environmental behaviour or simply an environmental action? To answer this question, a three-year longitudinal study was carried out, revealing that the awareness-raising campaign had a greater impact on stabilizing the children's behaviour than on the adoption of sustainable pro-environmental behaviour.

Keywords: environmental action; sustainable pro-environmental behaviour; school children; values

In the last ten years, there has been an increasing amount of research into environmental education (e.g. Jensen and Schnack 2006; Pilote 2006; Pruneau et al. 2006; Reid et al. 2008; Simovska and Bruun Jensen 2009; Tsevreni 2011). The vast majority of studies have sought to identify the factors that foster the adoption of pro-environmental behaviour in the educational domain. However, few have studied whether this behaviour is maintained in the long term. An extensive study was carried out over one year by Goldenhar and Connell (1991–1992) with 1619 university students living in a hall of residence; results showed that the students' recycling behaviour improved significantly when they were given feedback (e.g. displaying a graph in the hall of residence, showing the development of recycling behaviour), but that it remained similar to that of the control group when students were given only information leaflets. Likewise, by combining information, feedback and social interaction in groups, Staats, Harland, and Wilke (2004) obtained notable improvement in the household behaviour of 150 participants, which was maintained or even improved during the three years of the research. The authors also suggested that change can be predicted from the interplay between behavioural intention and habitual performance before participation, and the degree of social influence experienced during participation.

Our study extends this work as it took a longitudinal view of the battery-recycling behaviour of school children over a four-year period (2007–2011). It was the second phase of a larger study carried out with a sample of secondary school children living in the Centre Region of France. The first phase of that study involved a survey of 163 children aged 13–17. There were three stages, carried out one a week

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for three weeks: (a) in the first stage, data were collected via questionnaires (personal data and a values questionnaire); (b) in the second stage, the participants were given information about batteries and their harmful effects on the environment; and (c) a second data-collection stage via questionnaires to evaluate the participants' recycling behaviour prior to setting up the collection system, their perceived behavioural control and environmental awareness (knowledge about batteries, neighbourhood attachment, and attitude to recycling used batteries), and their intention to recycle their batteries after they had been told about a collection scheme in the school. The number of batteries returned by the participants over a four-month period was recorded. The results showed a 71% increase in the number of children returning used batteries. Moreover, they highlighted the importance of certain prerequisites – ethical (pro-environmental values), environmental (neighbourhood attachment) and cognitive (perceived behavioural control) – that are significant predictors of the recycling behaviour of secondary school children.

However, the question is raised as to whether the behaviour we assessed was effectively pro-environmental or merely an environmental action. In other words, was it a matter of individual spontaneous and self-determined acts which could become a habit or reflex (responsible environmental behaviour)? Or was it rather a question of actions carried out by a group within a given period, and thus not stable over time (environmental action)? The longitudinal study which followed on from the earlier study should answer this question.

While a number of authors (e.g. Bamberg and Möser 2007) consider that the expressions 'responsible environmental behaviour' and 'environmental action' are similar, others make a clear difference between them. This is notably the case of Emmons (1977) and Stern (2000), who considered that responsible environmental behaviour reduces our impact on the environment and refers in particular to behaviour that the individual incorporates in his/her everyday actions. Emmons (1977) made a clear distinction between environmental action, which he defines as a deliberate action by an individual or group involving prior to decision and planning. Thus, environmental action is directed towards the achievement of a specific environmental objective, while responsible environmental behaviour can refer both to a deliberate and self-determined action and to an automatic response based on habit or fear of social sanction. Acquiring responsible environmental behaviour is thus the aim of environmental education, in other words developing sustainable environmental behaviours that become habits can be applied to all aspects of daily life.

Our exploratory study investigated the factors promoting the adoption of sustainable pro-environmental behaviour in young people in a learning situation. It took a longitudinal approach and had three aims:

- (1) To show the short-term effect of the awareness-raising campaign.
- (2) To study how this effect was maintained over time and to compare it to that of a control group.
- (3) To identify the implicative paths from the initial group to group(s) at each subsequent assessment.

2. Method

As part of a programme to raise awareness about recycling used batteries, 163 children aged 13–17 (mean = 14.77 and SD = 0.99) attending secondary school in the

Centre Region of France answered a questionnaire assessing their current recycling behaviour (T0). This behaviour was re-evaluated four months after the awareness-raising campaign (T1) and then every year for three years (T2, T3 and T4). A control group composed of 150 children aged 13–17 ($M=14.81$ and $SD=1.03$) answered the recycling behaviour questionnaire at T0, T1, T2, T3 and T4. This group was created in a secondary school of similar size located about ten kilometres from the survey site to avoid the possibility of any discussion about the tool with the test participants, which could have biased our results. The parents' socio-economic and educational levels were also similar. Further details about the protocol can be found in the article of Rioux (2011).

Our field study was conducted over a three-year period and we are aware that, as in any longitudinal study of that length, the outcome could have been influenced by a number of variables which could not be controlled for or even sometimes identified. To overcome this problem, a short questionnaire was administered at T2, T3 and T4 to identify the events which could have influenced the pro-environmental behaviour between each stage. There were four questions in the questionnaire, with the same form (e.g. 'Since the last time you answered this questionnaire, have you been involved in a sustainable development action?'), followed by two complementary questions ('If so, has it changed your opinion?' and 'If so, has it changed your behaviour?'). The questionnaire ended with a fifth, open-ended question ('How many times have you heard about recycling used batteries?').

3. Data analysis

Correlation analyses were conducted to explore the first two aims. For the second aim, an analysis of comparison of means was also conducted to identify any psychological variables differentiating individuals whose behaviour changed over time with a shift towards a sustainable pro-environmental pattern.

For the third aim, implicative statistical analysis using CHIC software identified the likely pathways from the initial level (i.e. T1, the end of the awareness-raising programme). For each pathway, the contribution of respondees was explained statistically by the mean of the regression on the nomological network variables. Particular attention was paid to the behaviour adopted at T0 (before the awareness-raising procedure).

4. Results

4.1. Overall descriptive results

4.1.1. The questionnaire evaluating sorting behaviour

Seven behaviour profiles were identified: throwing used batteries in the trash can with household waste when at home or in the gutter when outside; sorting the used batteries but not taking them to the collection sites; and finally taking the used batteries for recycling (Table 1).

Results at T0 indicate that 32% of the participants neither threw away nor collected their batteries because their parents dealt with them (profile 1), and 35% of the participants systematically threw their used batteries away (profile 2). Only 3% adopted a pro-environmental behaviour. More specifically, three participants systematically recycled their used batteries (profile 6), and two used rechargeable batteries

Table 1. Descriptive results for the two groups (awareness-raising and control) for the seven behavior profiles.

	Questionnaire							Awareness-raising group (N= 163)							Control group (N=150)					
	Item 1*		Item 2**		Item 3***		T0		T1		T2		T3		T4		T0		T4	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Profile 1	No	53	32	No	25	15	22	13	8	5	4	60	40	25	17					
Profile 2	Yes	57	35	No	35	21	25	15	25	15	14	37	25	12	8					
Profile 3	Yes	23	14	Yes	12	7	21	13	21	13	21	13	21	14	23	15				
Profile 4	No	18	11	Yes	15	9	20	12	10	6	19	12	22	15	8	5				
Profile 5	No	7	4	Yes	16	10	15	9	21	13	17	10	5	3	15	10				
Profile 6	No	3	2	Yes	50	31	18	11	28	17	23	14	2	1	13	9				
Profile 7		2	1		10	6	23	14	30	18	43	26	3	2	24	16				
(rechargeable batteries)																				
Missing					1	.6	19	12	20	12	20	12	20	12	31	21				

*In the last four months, have you thrown away any batteries because they were used?

**In the last four months, have you thought about taking the batteries for recycling but not actually done so.

***In the last four months, have you taken any used batteries for recycling?

(profile 7). Profiles 3, 4 and 5 represent 29% of our sample and correspond to the participants who thought about recycling used batteries but did not systematically do so (Profile 3: they threw them away; Profile 4: their parents threw them away; Profile 5: they occasionally took their batteries to a collection site). At T1 (four months after the campaign), 60 participants (37%) adopted pro-environmental behaviour. Three years later (T4), 66 participants (40%) showed pro-environmental behaviour, including 43 who used rechargeable batteries. Two of the participants who had adopted pro-environmental behaviour before the programme (T0) maintained this behaviour, the third having left the cohort at T3. It should be noted that of the 20 participants who failed to answer the questionnaires over the three years, only three had refused to answer, while the others could not be contacted (moved out of the area, illness, etc.).

In the control group, five participants (two who systematically recycled their used batteries and three who used rechargeable batteries) adopted pro-environmental behaviour at T0. Three years later, 37 participants (i.e. 25% of the sample) adopted pro-environmental behaviour, of whom 24 used rechargeable batteries. Thirty-one participants (21%) were missing from the data over the three years, of whom 18 had refused to answer the questionnaire.

Comparison of the overall results with those of the control group reveals two points. First, the increase in the number of participants who systematically chose to recycle their batteries (profile 6) did not differ significantly between the two groups ($p < 0.09$). In the awareness-raising group, the number of participants who systematically recycled their batteries increased by 12% (from 2% at T0 to 14% at T4), while it increased by 9% (from 1% at T0 to 9% at T4) in the control group ($p = 0.12$). By contrast, the percentage of participants in the awareness-raising group who adopted pro-environmental behaviour (including those who chose to use rechargeable batteries) increased by 37% (from 3% at T0 to 40% at T4) compared to 22% (from 3% at T0 to 25% at T4) in the control group ($p < 0.05$). Secondly, the number of participants who refused to answer the questionnaire at least once during the three years was six times lower in the awareness-raising group (χ^2 (dl = 1) = 12.88, $p < 0.01$).

4.1.2. *The questionnaire identifying the events liable to influence pro-environmental behaviour between stages*

Analysis of the results shows that less than 2% of the participants said they had carried out a sustainable development action during the three years, and none of them thought that it had changed their opinion or behaviour. Less than 4% discussed the issue with their friends or family during the three years, and three participants thought that it had changed their opinion but not their behaviour.

By contrast, more than 97% had had classes about sustainable development each year, but less than 3% thought that this had had any impact on them, either in terms of their opinion (2%) or of their behaviour (2%).

Finally, less than 2% had heard about sorting used batteries during the three years, and of those, some had heard of it through friends who told them about our study. Moreover, the psychologist who contacted them was sometimes referred to as 'the battery lady', corroborating the fact that they had had very little information about sorting used batteries, or that they had paid very little attention to it.

These figures may appear abnormally low, but knowing that the children had classes on sustainable development every year, it is reasonable to suppose that they answered the other questions correctly.

4.2. Awareness-raising test–retest

4.2.1. The awareness-raising group

The T0/T1 correlation was 0.63 (39.69% of explained variance) and the adjusted correlation 0.39, allowing the regression residuals to be taken into account, neutralising as far as possible the effect of point of departure and notwithstanding some ceiling effects for high scores. Snedecor's F was 106.51, $p < 0.01$. The regression equation was: $T1' = 2.01 + T0 \times 0.74$. The Student's t -test coefficient was 10.32, $p < 0.01$ (Table 2).

The positive deviations from the estimate at T1 were related to neighbourhood attachment, to openness to change and to a lesser extent to perceived behavioural control. There was a negative correlation with self-affirmation.

4.2.2. Comparison with the control group

For the control group, the T0/T1 correlation was 0.35 (12.25% of explained variance) and the adjusted correlation was 0.12. Snedecor's $F(1,15)$ was 20.72, $p < 0.01$. The regression equation was: $T1' = 2.09 + T0 \times 0.62$. The Student's t -test coefficient was 4.55, $p < 0.01$.

The T0/T1 relationship was moderate, although the explained variance was three times lower. Thus, without awareness-raising, there was a more marked instability of responses between T0 and T1, in other words behaviour was more random. By contrast, the results suggest that awareness-raising could stabilise behaviour.

4.3. Maintenance of the effect over time

4.3.1. The awareness-raising group

From the observed effects (positive, negative and stable), six groups were constituted:

- A 'descending' group (negative correlation indicating regression to a lower group).
- A 'random' group (null correlation indicating the development of random choices).
- An 'ascending' group (positive correlation indicating a shift towards a higher group).
- Three stable groups corresponding to the choice of the same group at each test (Table 3).

Comparisons of means were then performed to identify socio-demographic and/or psychological variables likely to differentiate participants in the ascending group (i.e. whose behaviour tended towards pro-environmental behaviour) from other participants. Two values differentiated the two groups: 'Self-affirmation' ($t = 1.99$, $p < 0.05$) and 'Openness to change' ($t = 2.36$, $p < 0.02$). The higher the participants'

Table 2. Awareness raising test-retest.

Variables	Sex	Age	Attach	Attitude	PC	C	SE	OC	E	A
R variable/residual	-0.03	-0.03	0.31	0.00	0.11	0.07	-0.23	-0.31	-0.01	-0.02
Cohen's <i>d</i>	-0.06	-0.06	0.65	0	0.22	0.14	-0.47	0.65	-0.02	-0.04
Size of effect (*)	Negligible	Negligible	Intermediate	Negligible	Intermediate	Negligible	Intermediate	Intermediate	Negligible	Negligible

(*) We used the recommendations of Corroyer and Wolff (2003, 243), who, in line with Cohen (1977), suggested the following thresholds: negligible effect = 0 to 0.34; intermediate effect = 0.35-0.65; notable effect = over 0.65.

Attach: neighborhood attachment (Rioux and Mokoukolo 2005).

Attitude: attitude towards recycling (Rioux 2011).

PC: perceived behavioral control (Rioux 2011).

C: conservatism (Pilote 2006).

SE: self-enhancement (Pilote 2006).

OC: openness to change (Pilote 2006).

E: environmentalism (Pilote 2006).

A: altruism (Pilote 2006).

Table 3. Groups based on continuity of the effect (from T0 to T4).

Group	<i>N</i>
Descending	31
Random	6
Ascending	95
Stable (1)	15
Stable (2)	3
Stable (3)	13

(1) Young people who throw away their batteries or show no interest in what happens to them (batteries dealt with by parents).

(2) Young people who think about recycling their batteries.

(3) Young people who choose to recycle their batteries systematically or use rechargeable batteries.

level of ‘*Self-affirmation*’ and/or ‘*Openness to change*’, the more they tended to adopt sustainable pro-environmental behaviour.

4.3.2. *Comparison of trends over time with the control group*

Table 4 presents the numbers and percentages of the two groups with regard to maintenance of the effect over time.

The differences in frequency were statistically significant (χ^2 ($df=3$)=32.15, $p<0.05$). A more detailed analysis of the results revealed three different patterns. In the first, the percentage of participants for whom the T0–T4 comparison was classified as ‘stable’ (relatively unchanging behaviour) was twice as large in the control group as in the awareness-raising group (21 vs. 10%). In the second, the percentage of participants for whom the T0–T4 comparison was classified as ‘descending’ or ‘ascending’ was higher in the awareness-raising group than in the control group. This effect is shown both with a descending (4 vs. 10%) and an ascending trend (19 vs. 30%). This suggests that awareness-raising has a long-term effect and could thus produce a ‘delayed effect’ on response choices. In the third pattern, the percentage of participants for whom the T0–T4 comparison was classified as ‘random’ (no clear relationship) did not differ significantly between groups ($p>0.05$).

4.4. *Implicative pathways*

Statistical implicative analysis (Gras et al. 1996) has become very well-established in recent years (Gras et al. 2008). Its main interest is that, unlike traditional psychometric methods, it uses non-symmetrical links, enabling the sequential organization of variables to be investigated.

Table 4. Comparison of groups with regard to maintenance of the effect over time.

	Control group		Awareness-raising group	
	<i>N</i>	(%)	<i>N</i>	(%)
Descending	11	4	31	10
Random	13	4	6	2
Stable	66	21	31	10
Ascending	60	19	95	30
Whole group	150	48	163	52

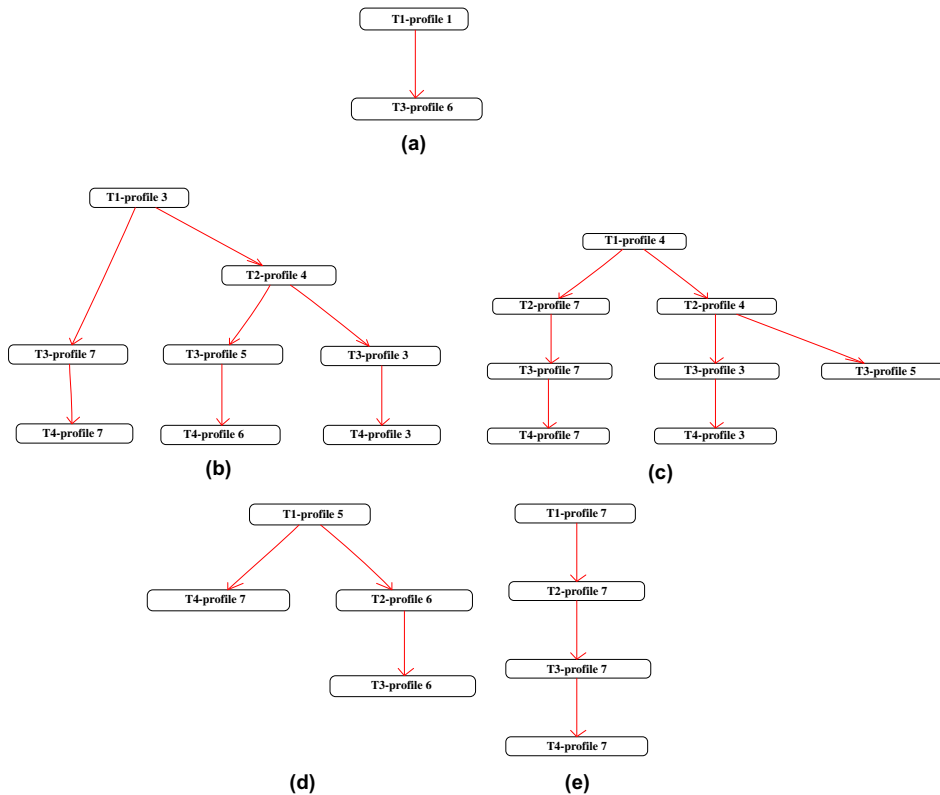


Figure 1. Implicative pathways from the different profiles assigned to the respondents at phase 1. (a) Implicative pathways from T1 (profile 1), (b) Implicative pathways from T1 (profile 3), (c) Implicative pathways from T1 (profile 4), (d) Implicative pathways from T1 (profile 5), and (e) Implicative pathways from T1 (profile 7).

The CHIC (Classification Hiérarchique Implicative et Cohésitive) programme used to process the data in this study revealed the probable pathways from the starting point T1 over the following three years (Figure 1).

The first pathway (Figure 1(a)) is that of the young people who did not recycle their batteries during the awareness-raising action but who did recycle them at T4, three years later. Note that these were children who did not previously manage their own batteries, this being done by their parents.

Figure 1(b) shows the pathway of the participants who thought about collecting used batteries but continued to throw them away during the awareness-raising action. Over time, some of them started to use rechargeable batteries while the majority did not change their behaviour. These were essentially children who threw their batteries away before the system was set up.

The group represented in Figure 1(c) was composed of children who thought about recycling their batteries during the protocol but did not bring them to the collection point. Some opted for rechargeable batteries, but most continued to think about it without actually recycling their batteries over time. As could be expected, they had already thought about the question before the protocol without doing anything about it.

Figure 1(d) shows the implicative pathways from T1 for the participants who brought in some of their used batteries during the awareness-raising action. They continued their pro-environmental behaviour, either by recycling their used batteries or by using rechargeable batteries.

Finally, Figure 1(e) shows the implicative pathways of the participants who used rechargeable batteries at T1. This group included the children who used this type of battery before the action was set up and also those who did not manage their own battery use, generally leaving this to their parents.

5. Discussion

The awareness-raising action, evaluated by the difference between T1 and T0, resulted in a 16-fold increase (from 3 to 50) in the number of participants who adopted battery-recycling behaviour (profile 6). Four variables predicted this increase: neighbourhood attachment, openness to change, self-affirmation, and to a lesser extent perceived behavioural control. Three years later, only half maintained this pro-environmental behaviour. Two explanatory variables emerged: self-enhancement and openness to change. The latter fostered the emergence and continuity of the behaviour, while the former hindered the adoption of the behaviour but appeared to be involved in its continuity. Knowing that this is linked more to normative clear-sightedness (Becker and Félonneau 2010), we retained the weight of 'Openness to change', a value that teachers and educational specialists can use to get young people to subscribe to pro-environmental social norms.

It should be recalled that the 'Openness to change' dimension of the French adaptation (Pilote 2006) of Stern, Dietz and Guagnano's inventory of values (1998) used in this study comprises three items: varied life, exciting life and curiosity. From an educational point of view, it follows the phenomenological approach, notably that of Rogers or Dewey who emphasised the importance of action and how individuals construct knowledge. This way of teaching through action sees the child as a whole, his/her feelings as well as intelligence, as both an individual and a social being; it encourages the child's engagement and responsibility by developing his/her openness to change and facilitate the personal integration of the processes of change and learning. How can this openness to change be encouraged in practice? Our short questionnaire shows that specifically teaching children about sustainable development does not modify their opinion or perceived behaviour. We believe that it is important to give priority to cross-curricular education, which in itself would represent a change from other more traditional styles of teaching. Education is essentially a way of opening up to the world and to its diversity of cultures, opinions, models of civilisation and techniques, and is a factor of change for the child; but, education must also show by its action that change is not to be feared and must be valued. Apart from actions encouraging the adoption of environmental actions such as the one described in this study, one can think of transdisciplinary literature reviews or setting up projects over a sufficiently long period of time that the children can experience the change and see for themselves that they can be beneficial.

During the awareness-raising action (T0–T4), the number of children who recycled their batteries increased sevenfold (from 3 to 23) (profile 6). This result could be seen to be disappointing compared to the control group which showed a similar increase, from 2 to 13. However, two comments can be made. The first concerns the number of children opting for rechargeable batteries (profile 7); in the aware-

ness-raising group, this number increased more than 20-fold (from 1% at T0 to 26% at T4) while it increased 8-fold (from 2% at T0 to 16% at T4) in the control group. This raises the question of whether the environmental action had an impact on the adoption of pro-environmental behaviour (profiles 6 and 7) more than on the battery-sorting behaviour (profile 6). If this result is confirmed by other studies, we believe that the question of shifting from an environmental action (sorting used batteries) to a more costly but environmentally friendly action (buying rechargeable batteries) merits particular attention.

The second comment concerns why the number of children who recycled their batteries increased, even in the control group. One possible explanation is the age of the children; the study lasted three years, and during that time the participants moved from pre-adolescence to adolescence. They had gained greater autonomy in relation to their family, which is supported by the fact that fewer of them let their parents deal with their used batteries (from 105 at T0 to 31 at T4, both groups combined). It is reasonable to suppose that their judgment had developed, building on the values of their family and those of their social environment (school, the media, clubs or friends). Everything happened as if the study had had no decisive impact on the battery-sorting behaviour, but on the decision whether or not to adopt this pro-environmental behaviour.

While the increase in the number of children who adopted pro-environmental behaviour did not differ significantly from that obtained in the control group, there was greater stability of the behaviour. Analysis of the maintenance of the behaviour over time thus shows that the awareness-raising action had a dual effect:

- (1) In the short term (from T0 to T1), it produced a greater stabilisation of behaviour, the participants in the control group showing a more marked instability of responses.
- (2) In the longer term (from T1 to T3), the awareness-raising action produced more marked reclassification effects, either 'ascending' (moving towards pro-environmental behaviour) or 'descending' (a shift in the opposite direction).

It could be thought that the awareness-raising action led the children to make a reasoned choice, whatever it was. For example, it would have led them to really consider whether or not to adopt pro-environmental behaviour and to justify their decision. Based on Ajzen's Theory of Planned Behaviour (1988, 1991), we suggest that it had an impact on their perception of control over their behaviour or their beliefs regarding the consequences of their behaviour. More precisely, they could choose not to adopt the pro-environmental behaviour because they thought that they were not capable of making the effort and/or because they thought that it served no purpose. However, a participant, who believed that adopting pro-environmental behaviour was important but that he/she was unable to do so, could resolve this dilemma by using rechargeable batteries. The significant increase in the number of participants opting for rechargeable batteries at T4 compared to the control group indicates that the awareness-raising action had a sustainable impact.

Studying the implicative pathways from T1 provides additional elements. These pathways show clearly that the young people who maintained the battery-sorting behaviour were (a) those who already had this behaviour prior to the awareness-raising action, and (b) those who had never thought about sorting batteries because their parents dealt with it. Most of the participants who had thought about recycling

prior to the awareness-raising action without actually doing anything about it continued the same type of behaviour. In other words, this study confirms the importance of training young people as early as possible, before the question of whether or not to recycle is raised.

It also supports work by Geller (2002) which shows that when an individual deliberately commits an 'incompetent' behaviour (e.g. throwing away used batteries after thinking about the issue of recycling) which gives access to certain advantages and/or avoids negative consequences (e.g. avoiding the effort of recycling and taking batteries to a recycling point), it is very difficult to change this behaviour. Geller states that this change involves a change in motivation and recommends aiming for an 'unconsciously competent' behaviour along the lines of environmental protection. We suggest facilitating the adoption of this behaviour in terms of place and time. For example, a permanent collection site could be set up in or near the school. Environmental actions could be incorporated in the children's home-work and given value through assessment.

We believe that the main limitations of this work are related to its longitudinal aspect, as some participants failed or refused to respond at each stage of the study. We felt that it was important to keep them in the cohort, but we do not really know why some participants refused to respond. Moreover, as the children recognised the psychologists who administered the questionnaires in the previous year, they may have anticipated the expected responses, raising the question of how much of the data reflected a desire to please (or provocation). This social desirability trend may have been greater among the children who took part in the awareness-raising action, in spite of the fact that we ensured that this phase was carried out by a different psychologist. Finally, used-battery collection in the school only lasted the length of the awareness-raising action (4 months), and we have little quantitative information with which to assess the number of batteries taken to collection sites by the participants after this period. We only know that a café, selling cigarettes and newspapers near the high school where most of the participants continued their studies, became a collection site *at the request of the high-school children*.

6. Conclusion

The aim of teaching about the environment is to foster the acquisition of environmental behaviour in order to ensure long-term environmental protection. It thus involves developing sustainable and widely applied behaviour from the earliest possible age: sustainable because it should become an everyday and spontaneous reflex, and widely applied in that the behaviour should be generalised to other situations. In this study, we essentially obtained sustainable behaviour among the young people who had not considered the issue of recycling their batteries prior to the awareness-raising action, either because they had already systematically recycled their batteries and thus already had an environmentally sustainable behaviour, or because they had not previously thought about whether or not to recycle their batteries because their parents dealt with them. However, the impact was very weak, or even non-existent, among those who had thought about recycling but not done anything about it. In addition, further studies are required to determine whether this battery-recycling behaviour was applied to other objects (household waste, bottles, etc.).

Notes on contributors

Liliane Rioux is a professor at the University of Paris Ouest-Nanterre La Défense (France). Her specialty is work-place environmental psychology. Her current research addresses space appropriation, place attachment and comfort in relation to satisfaction with the environment. Recently, her works have also focused on pro-environmental behaviours and processes which promote their emergence in organisational and training contexts.

Daniel Pasquier, doctorate in Psychology and Educational Sciences, is a practitioner researcher. From the use of psychometric models, he is author or co-author of tests, books and articles. His research interests are dynamic assessment of learning potential, description of the personality and socionormative distance.

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