Educating Children to Environmental Behaviours with Nudges: The Effectiveness of Social Labelling and Moderating Role of Age

Karine Charry [a]* and Beatrice Parguel[b]

[a] *Louvain Research Institute in Management and Organizations, Université Catholique de Louvain, Mons, Belgium;* [b] *DRM-UMR7088; PSL Research University,Paris, France*

Charry Karine, Chaussée de Binche, 151, 7000 Mons, Belgique,
karine.charry@uclouvain.be

Beatrice Parguel, Place du Maréchal de Lattre de Tassigny, 75016 Paris, France

Karine Charry is Associate Professor of Marketing at UCLouvain, Belgium. Her research focuses on learning new behaviours in the context of social marketing issues, mainly (childhood) obesity, pro-environmental behaviours and consumers' empowerment. Her work has been published in Journal of Business Ethics, International Journal of Advertising, International Journal of Retail and Distribution Management, Recherche et Applications en Marketing, … She has also contributed to books on current communication means and research in marketing and is member of the Centre for Marketing and Public Policy, a research tank that addresses various societal issues, notably environmental ones (http://marketingandpublicpolicy.com/). Her ten-year experience in various companies and sectors contributes to the pragmatic and consumers' welfare perspective she brings to her teaching (Social Marketing, Persuasion in Marketing Communication, Consumer Behaviour in a Digital World...) and publications.

Béatrice Parguel is a CNRS researcher in applied psychology within Paris-Dauphine University. She animates the Center for Marketing and Public Policy Research (http://marketingandpublicpolicy.com/), a research tank dedicated to the exploration of the

societal implications of consumption. Her research, based on psychological theories and experimental methodologies, particularly investigates consumers' information and education. Recently, her research has contributed to the exploration of subjects like greenwashing and "executional greenwashing", overpackaging withdrawal and the implications of the sharing economy in terms of sustainable development. Her recent research is published in journals such as *International Journal of Research in Marketing*, *Journal of Business Ethics*, *Journal of Business Research*, or *Technological Forecasting and Social Change*. Béatrice Parguel has won several awards for her research

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Funding: This work was supported by the French Ministry of Ecology, Sustainable Development and Energy [grant MOVIDA – Consommation et Modes de Vie Durables].

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Considering the global warming urgency, increasing the pace at which pro-environmental behaviours are learned and embraced is essential. To achieve this objective, it seems reasonable to consider children as, beyond their current and future actions, they are perceived as "change agents". Children indeed influence close family and friends in the adoption of new behaviours. Yet, studies that consider these 'researched' remain too limited. This paper investigates original ways for children to learn and adopt "eco-friendly" behaviours, using social labelling. An experiment conducted among 115 preadolescents (children aged between 7–12 years) reveals that merely labelling them as "eco-friendly" is sufficient to "spill over" and trigger subsequent intentions to behave ecologically through an extremely simple protocol. It also shows that the most effective age is just above 10. Last but not least, the intentions to behave ecologically persist a week after the labelling, suggesting that children have integrated the new behaviours.

Keywords: social labelling; children; nudges; role of age; ecological behaviour

Introduction

Around the world, scholars and practitioners are investing tremendous energy in exploring ways to educate, hence, encourage pro-environmental behaviours. Yet, despite the evident need to curb the current climate change (IPCC, 2014), and some encouraging trends (notably the Environmental Education Research Special Issue of 2007), attention to strategical targets, such as children, remains limited. Children are indeed identified as a strategic group in many education areas, but they remain surprisingly under-considered in original environmental research programs that could expend effectiveness (Grønhøj & Thøgersen, 2012, Olsson *et al.*, 2016).

Still, focusing on children when educating to pro-environmental behaviours is decisive for at least three reasons. First, children represent a large part of the world's population. According to the United Nations (2017), 15% of developed countries' populations in 2015 are under the age of 15, a number that may seem relevant enough to justify the focus. Second, children significantly influence the consumption patterns of the adults closely interacting with them (Ekstrom *et al.*, 1987). As such, children are described as "change agents", influencing not only their parents' but also their siblings' and peers' attitudes and behaviours (Ballantyne *et al.*, 2006, Evans *et al.*, 1996). Third, many attitudes and behaviours are formed during childhood (Bucciol & Veronesi, 2014, Palan *et al.*, 2010), and the latter tend to be life-long, notably in the context of environmental issues (Chawla, 1999, Wilson, 1996). Furthermore, environmental identity would also depend upon childhood experiences of nature (Prévot *et al.*, 2018). Encouraging children to adopt eco-friendly behaviours, now, may consequently have long-term impacts on the environment. As stated by Stern (2006), today's actions and those of the next 20 years will have a profound effect on the climate of the second half of the century. This certainly explains the calls for further research on how to "encourage young people to engage in environmentally benign activities, including research on the formation of a pro-environmental behaviour pattern in a young age" (Grønhøj & Thøgersen, 2012) and, notably, on investigating the most effective age of children when considering such an enterprise (Collado *et al.*, 2015).

In this perspective, this study examines the educational potential of nudges in the domain of pro-environmental behaviours. "Nudges" are simple, non-paternalistic tools that do not resort to long and demanding education programs but instead spontaneously trigger the relevant behaviour. It therefore guarantees individuals' freedom of choice (Thaler & Sunstein, 2008) and may avoid reactance, which arises

when attempts to force behavioural changes are felt as too pressuring (Clee & Wicklund, 1980) and may consequently produce preferences for the "forbidden fruit" (Brehm, 1989). In this research, we study how overtly stressing children's personality trait or values with a "social label" related to eco-friendliness may induce behaviours that are consistent with the label. Furthermore, we investigate how this may enable children to climb on the "virtuous escalator" (Thøgersen & Crompton, 2009) of spillover effects, the adoption of one behaviour leading to subsequent other ones.

Forty years ago, two seminal pieces of research demonstrated that social labelling could contribute to children's education in various domains (Grusec & Redler, 1980, Miller *et al.*, 1975). Yet, they did not look into environmental issues. Some major differences between pro-environmental behaviours and the ones more commonly taught to children renders necessary the task we propose today. First, pro-environmental behaviours are considered particularly challenging (Pieters *et al.*, 1998, Rothschild, 1979). They involve "social dilemma", a concept implying that individuals will sacrifice comfort or belongings for the sake of society while personal benefits are not clearly perceptible nor tangible (Pieters *et al.*, 1998). Second, those benefits are experienced through a "delayed gratification", as the positive results are not immediate. Mischel and his colleagues (1989) showed how difficult it is for children to trade the one biscuit they can enjoy now for the benefit of receiving more later. One can therefore imagine how demanding it is for children to sacrifice the pleasure and comfort of hot running water under the shower when the benefit is "saving the planet", a much more delayed and abstract concept than "eating more biscuits later".

In this paper, through an experiment conducted among 115 children aged 7 to 12, we therefore extend previous research in three important directions. First, we explore the potential of social labelling in educational areas that are reputedly difficult

to foster in children, due to the delayed gratification, the altruistic concerns and the abstract concepts the pro-environmental benefits imply. Second, investigating the moderating role of age in the environmental educational process, we answer a still open question. Last, we contribute to the literature on "nudging approaches" as we propose to test an extremely simplified protocol in comparison to the one used so far.

Theoretical Background and Hypotheses

Self-perception Theory and Behavioural Spillover

When explaining underlying mechanisms of behavioural spillover, or how people learn new behaviours based on their previous actions, research commonly relies on cognitive dissonance (Festinger, 1957) and self-perception (Bem, 1972) theories. Both theories emphasize how an initial event may contribute to the salience of people's values and personality (Cornelissen *et al.*, 2007), and may therefore trigger behavioural spillover (Truelove *et al.*, 2014). For example, Poortinga, Whitmarsh and Suffolk (2013) demonstrate an increase in environmental identity in Wales after the introduction of the carrier bag charge, compared with England where no carrier bag charge was introduced. Van der Werff, Steg, and Keizer (2013) show that reminding people of their previous environmentally friendly actions influences their current "green" product decisions, mediated by their environmental identity. These studies suggest that cueing people about the positive environmental outcomes of their behaviour leads to perceptions that they are concerned about environmental issues (Cornelissen *et al.*, 2008), and alters their self-concept, the representation that individuals have of themselves (Rosenberg, 1979).

As a consequence of this change in self-concept, people may eventually adopt the range of behaviours consistent with this change, mainly to avoid cognitive

dissonance which Festinger (1957) defines as a state of drive, need, or tension. More precisely, people try "to establish internal harmony, consistency, or congruity among opinions, attitudes, knowledge and values" (Festinger, 1957, p. 260). People strive for consistency within themselves, between what they have learned, know or believe and what they do. In the presence of inconsistency between what they believe and what they do, they experience psychological discomfort that "gives rise to pressures to reduce that dissonance" (Festinger, 1957, p. 18). In turn, they can lessen the discomfort by changing one of the elements involved in dissonance, that is, by changing what they believe or changing what they do. Eventually, a change in their own self-concept urges them to align their behaviours with their new self-concept. Therefore, people's need for consistency explains the behavioural spillover (Truelove et al. 2014). It also supports conclusions that indicate global positive net effects of initial and spillovers behaviours even if negative ones may punctually occur (Gillingham *et al.*, 2013, Truelove *et al.*, 2014).

In research conducted on behavioural spillover, most of the interventions involve obtaining an initial concrete behaviour to serve as a cue. Although such behaviour may be encouraged (e.g., financially, by praise) and may not be spontaneous in the first place, consistent subsequent behaviours tend to occur (Lanzini & Thøgersen, 2014). The self-perception theory (Bem, 1972) states that people can learn about themselves by observing their own behaviours, as much as they would from other people's behaviours. If people believe that they acted without the pressure of external influences, they learn from past behaviour used as cues or heuristics and infer what to think about an issue. They form attitudes to decide on subsequent behaviours (Cornelissen *et al.*, 2008, Lanzini & Thøgersen, 2014), including behaviours in domains other than the one initially considered (Cornelissen *et al.*, 2008). Consequently, one

obvious challenge of behavioural spillover is motivating, in a nonintrusive way, the initial pro-environmental behaviour that the person is supposed to attribute to genuine internal dispositions to subsequently modify his or her own self-concept.

Self-perception theory in social labelling

Among the techniques teaching specific behaviours through enhancements or changes in individuals' self-concept, social labelling is a particularly interesting one to consider. Cornelissen et al. (2007, p. 279) define social labelling as a "technique that consists of providing a person with a statement about his or her personality or values (i.e. social label) in an attempt to provoke behaviour that is consistent with the label." Some studies suggest that directly labelling people can be sufficient to change the self-concept (e.g. Cornelissen *et al.*, 2007, Tybout & Yalch, 1980).

Interestingly, social labelling seems to rely on some ambiguity around the original motivations of the initial behaviour which offers some ways to bypass the challenge discussed above. Cornelissen et al. (2007) show that labelling people on the basis of a manipulated behaviour is sufficient to enhance pro-environmental dispositions and, consequently, to motivate further pro-environmental behaviours. Although consumers may select the most ecological television set primarily for reasons other than its ecological criteria (i.e., quality, price), stressing the pro-environmental dimension of the selected option enables them to reconsider their original motivations and to attribute their choice *also* to ecological concerns and their self-perceived pro-environmental dispositions (Cornelissen *et al.*, 2007). Labelled a certain way, consumers would *re*attribute their initial behaviour's motivation to the qualities stressed by the label (potentially in addition to the original ones) and, therefore, to themselves, their personality, and, more broadly, their self-concept. Going further, Tybout and Yalch (1980) suppress the burdensome manipulation intended to trigger an initial

concrete behaviour in their study on voting in local elections. Purportedly using participants' responses to a questionnaire, they randomly labelled voters as "above-average citizens" or "average citizens." Although the values and traits stressed by the label are plausible, they are neither associated with real behaviour nor with the real motivations of the behaviour. Eventually, labelling participants as above-average citizens (Tybout & Yalch, 1980) or as eco-friendly (Cornelissen *et al.*, 2007) on the basis of their purported previous behaviour produced the desired behavioural spillover effects.

Still, research suggests that the social labelling technique is only effective when people do not perceive any influence of any kind (Becker, 1963, Cornelissen *et al.*, 2007, Kraut, 1973). As mentioned previously, Tybout and Yalch (1980) use an "above-average-voter" label to enhance their participants' self-perception as "voters", a subtle label difficult to reject, notably because people do not know much about others' voting habits. They show that their label is only effective when people indeed perceive themselves as "good voters" (i.e., when the label is consistent with self-perceptions). This suggests that people who perceive themselves as "bad voters" could identify the tentative of influence and reject it. Social labelling with adults indeed leads to subsequent behaviour if a credible label has been proposed (Allen, 1982, Summers *et al.*, 2016). The credibility of the label represents an essential condition to foster people's inferences about their own dispositions. That is, labelled individuals must perceive the characteristic underlined as plausible and the labelling not too peculiar. More generally speaking, educational practices that seem too paternalistic or too directive elicit reactance (Brehm, 1989) that potentially diminish the effectiveness of the tactic. Therefore, when attributing the selection of a television set to their participants' eco-friendliness, Cornelissen et al. (2007) added a distraction task to the

experimental protocol to hide the educational objective. Prevented from identifying the latter, participants did not reject the label, thus ensuring its effectiveness.

Social labelling, Children and Age

Based on the above, we assume that the effectiveness of the social labelling technique relies on two essential conditions. First, the technique requires that the target has a developed self-perception or self-concept. As indicated previously, behavioural spillover effectiveness is based on the label's ability to make pro-environmental dispositions salient in a person's mind and to enhance his or her environmental identity. Being aware – or being made aware (Summers *et al.*, 2016) – of one's identity trait is a necessary condition to influence subsequent behaviours. Second, to be effective, the social labelling technique requires that no reactance is triggered or that the target does not perceive any attempt at directing the behaviour and rejects the label.

Considering these two conditions, we propose that the social labelling technique will be particularly effective among children and, more specifically, among preadolescents (7–12 years), which is considered a specific unit of analysis in child development literature (John, 1999, John, 2008). Various elements corroborate the assumption of an optimal "age window." We argue that social labelling will not be effective before this age window because self-concept tends to develop around the age of 7 or 8 years (Leflot *et al.*, 2010, Marsh *et al.*, 1984) and, increases with age (Campbell *et al.*, 1996, Marsh *et al.*, 1984). This suggests that before preadolescence, children are not able to reattribute the eco-friendly label to their dispositions, because they do not have a clear sense of their identity. Then we propose that it will be less effective after preadolescence because individuals entering adolescence (after 12) experience a rise in the level of reactance (Grandpre *et al.*, 2003, Van Petegem *et al.*, 2015).

Within this age bracket of preadolescence, we find individuals struggling with the development of their self-concept and search for individuality (Marsh *et al.*, 1984). Self-concept indeed develops with age (Campbell *et al.*, 1996, Marsh *et al.*, 1984), in a context of psychological and social developments that also evolve as children grow older (Bachmann *et al.*, 1993, Christie & Viner, 2005). Those elements render the age group increasingly self-conscious (Chaplin & Roedder John, 2007). Consequently, they seek elements that may potentially help them fight the insecurity they experience (Chaplin & Roedder John, 2007). Children show a strong emotional bond with nature which leads to protective dispositions towards the environment (Rios & Menezes, 2017). Therefore, we may expect that a label stressing the latter would be perceived as positive. It would signal their belongingness to a group they value and support their search for identity. As such, preadolescents might be particularly reluctant to act against this label. Of note, when social identity (i.e., the social dimension of the self-concept) is salient in the expected behaviour, people tend to feel an additional "inner obligation to act" consistently, to remain in line with their group's objectives (Stürmer *et al.*, 2003). Self-concept and search for identity increasing along with age -within the age bracket considered - one can therefore expect the effectiveness of social label to follow the same pattern.

Yet, it remains important to precisely identify the most effective age at which instilling pro-ecological behaviours (Collado *et al.*, 2015), notably with social labelling. In two pioneering studies, 10-year-olds were educated to tidiness, and 7-year-olds were encouraged to persevere at school (Miller, Brickman, and Bollen 1975). Grusec and Redler (1980) enhanced sharing behaviours in 8- and 10-year-olds. These authors offer different views on the optimal age: Miller et al. (1975) consider that the younger means more malleable thus more effective, while Grusec and Redler (1980) think akin to us

that a better perception of identity will lead to more effective changes. Yet, they do not empirically test their different perspectives. Last but not least, the studies used particularly complex and extensive protocols. The label was applied a significant number of times, over several days, before its effectiveness was measured, thus limiting a large-scale application of the technique, notably in schools. Therefore, we aim at expending their results in an eco-friendly context, demonstrating the effectiveness of social labelling with a simplified procedure and most important, the moderating role of age. Based on self-perception theory and prior findings on children's level of reactance, we hypothesize the following:

H_1: An eco-friendly label will be effective among preadolescents.

H_2: The effectiveness of an eco-friendly label depends on preadolescents' age, such that within this specific age bracket, a label applied to older children will be more effective than a label applied to younger children.

Method

Sample

To test our hypotheses, we conducted a single factor between-subjects experiment in a Belgian primary school over a three-week period. This familiar environment, in the company of friends, would ensure that children are more relaxed and opened although researchers are not known to them (Charry & Demoulin, 2012, Rust & Hyatt, 1990). Data collection included 115 children (M_{age}: 10 years, 54% female) attending different levels of primary classes. We selected the school because of its representativeness in terms of various socioeconomic backgrounds.

Procedure and Variables

We randomly assigned the children from each class to either the social labelling or the control condition. In the introductory phase (Phase 1), one week before the labelling took place, teachers collected an initial set of data, including the children's environmental perceptions using four items from Larson, Green, and Castleberry's (2011) eco-awareness scale (i.e., "Plants and animals are important to people," "Nature is easily harmed or hurt by people," "Plants and animals are easily harmed or hurt by people," and "People need plants to live"; α =.75). This variable is used as a covariate in the following analyses, as gender is. The questionnaire included several filler unrelated preferences. Using the same procedure as Tybout and Yalch (1980), this questionnaire is used to make sure that the label randomly applied in Phase 2 would be perceived as plausible; Therefore, phase 1 ensures the label acceptance (Cornelissen *et al.*, 2007, Guadagno & Burger, 2007, Tybout & Yalch, 1980).

In the labelling phase (Phase 2), the experiment took place in a specific room assigned by the school. Children were welcomed by two researchers, presented with a cover story (i.e., find out about children's current interests and opinions on a variety of topics such as preferences for school subjects and hobbies), and thanked for their answers to the first questionnaire a week before. Children in the social label condition were then presented with the label. Using the exact same wording across classes, the same researchers stated that from the first questionnaire, the research team was able to identify "how respectful of nature and how attentive to protect the environment they were." No mention was made of the children's level of environmental concerns in the control condition. The analysis of information gathered on the children in Phase 1 indicates that there were no significant differences across the participants randomly assigned to one or the other condition during Phase 2 in terms of age ($F_{(1,112)} = .18$, $p = .67$), gender ($\chi^2(1) = .57$, $p = .45$), and environmental perceptions ($F_{(1,112)} = 1.75$, $p =$

.19). After the experimental manipulation, the children took part in a paper-and-pencil study and answered five ad hoc questions measuring self-rated pro-environmental behaviours (i.e., “I throw cans of Coke in the ‘good’ bin”; “When leaving a room, I turn off the light”; “I save water by taking showers instead of baths”; “I save paper by writing on both sides of a sheet”; and “I help my parents to sort waste”; $\alpha = .54$). Children in both conditions answered exactly the same questions. The two researchers provided answers to individual questions, to ensure that all items were fully understood. They also verified that children provided personal answers.

In Phase 3, one week after the manipulation took place, teachers collected a final set of data, including children’s self-rated pro-environmental behaviours using three items from Collado and Corraliza’s (2015) scale, developed specifically for the target: “I carry out activities to protect the environment”; “In school, I talk to my teachers and peers about the importance of doing things to protect the environment (e.g., recycling)”; and “At home, I help to separate and to recycle” ($\alpha = .69$). We added several filler unrelated questions to the scale, to dilute children’s attention. The latter objective also motivates the use of different scales to measure self-rated pro-environmental behaviours in phases 2 and 3

We measured all constructs with four-point Likert scales, as prior research recommends (Peracchio & Mita, 1991) and is generally observed in studies focusing on children (van Reijmersdal *et al.*, 2012).

Results

The analyses conducted to test the hypotheses controlled for children’s environmental perceptions (as measured in Phase 1) and gender. Floodlight analyses (Process, Model 1, with 1000 bootstraps, 95% confidence interval) using the Johnson–Neyman technique (Johnson & Neyman, 1936) enable us to identify the region in terms of age in

which the eco-friendly label significantly influences the self-rated pro-environmental behaviours measured right after the labelling and one week after the labelling. Table 1 presents the results of the floodlight analyses.

Regarding the self-rated ad hoc pro-environmental behaviours that we measured right after the labelling, the analysis reveals a significant interaction between preadolescents' age and the eco-friendly label ($\beta = .19$, $t = 2.54$, $p < .01$). Among older preadolescents (i.e., older than 10 years and 3 months; $\beta_{JN} = .17$, $t = 1.96$, $p = .05$), a regression analysis shows that the eco-friendly label significantly increases pro-environmental behaviours ($R^2 = .36$; $\beta = .41$, $t = 3.25$, $p < .01$). Such an effect does not appear among the youngest ones of our preadolescent sample, in support of our hypotheses, with an immediate measure of self-rated pro-environmental behaviours.

Regarding the self-rated pro-environmental behaviours index that we measured one week after the labelling, the analysis reveals the same interaction between preadolescents' age and the eco-friendly label, though the interaction is only marginally significant ($\beta = 1.43$, $p < .07$). Among older preadolescents (i.e., older than 9 years and 9 months; $\beta_{JN} = .27$, $t = 1.96$, $p = .05$), a regression analysis shows that the eco-friendly label significantly increased pro-environmental behaviours ($R^2 = .32$; $\beta = .31$, $t = 2.71$, $p < .01$). Here too, such an effect does not appear among the youngest participants, again in support of our hypotheses, with a delayed measure of self-rated pro-environmental behaviours.

To corroborate the representation of the interaction that emerged in the floodlight analyses, we split the sample according to the children's age and ran two analyses of covariance (ANCOVAs) with the two measures of self-rated pro-environmental behaviours successively. We named preadolescents younger than 10 years as "younger preadolescents" and the others as "older preadolescents." As we

expected and show in Table 2, these analyses confirmed our previous results. Figure 1 displays the pattern of results corroborating our hypotheses.

Discussion and Conclusion

The results of the experiment presented in this paper offer new insights into the education to pro-environmental behaviours through social labelling theory and behavioural spillover effects of relevant original "researched" ones. They show that preadolescents (7–12 years) represent a much more inspiring group than what is usually considered in environmental education, also because the protocol proposed in an extremely simple one to implement, accessible to all structures and cultures.

Expanding traditional behavioural spillover studies (Truelove et al. 2014) and corroborating Tybout and Yalch's (1980) previous work on social labelling, we show that effectiveness is not necessarily bound to an initial behaviour. Although this was assumed in the most commonly cited research in psychological literature that investigates cross-sectional correlations among multiple pro-environmental behaviours (e.g. Berger, 1997, Weber, 1997), we show the effectiveness of a label based on a simple list of questions (without concern for the answers) and applied only once. This offers a much simpler protocol than the ones previously used (Grusec & Redler, 1980, Miller *et al.*, 1975). Labelling children was sufficient at inducing pro-environmental behaviours, even though the labelled group did not differ from the control group in its level of attitudes toward the environment. This study provides additional evidence that social labelling effectiveness is dependent on the degree to which people find the label "plausible" (Tybout & Yalch, 1980). It also confirms the assumption that effectiveness of social labelling relies on the reattribution of the behaviour to personal characteristics,

as the effectiveness of social labelling techniques increases with age, that actually contributes to the development of self-concept.

This implies that the focus should not necessarily be on how to trigger the first behaviour, as the definition of Truelove et al. (2014) proposes, but on how to facilitate the reattribution.

We also offer a response to the question revolving around children's age and effective environmental education in general (Collado *et al.*, 2015) and through social labelling (Grusec & Redler, 1980, Miller *et al.*, 1975). We show that 10–12 years is the most effective age for the children in our sample. As such, we argue that social labels will likely be less effective in the lower bound of our age group. Specifically, younger preadolescents' self-concept may not be sufficiently developed (Campbell *et al.*, 1996, Marsh *et al.*, 1984), and thus they should not be used as a reference for subsequent behaviours, as self-perception theory proposes (Bem, 1972). Regarding the upper bound of the age group, as our sample did not contain children older than 12 years, we can only rely on previous research to infer how the label will operate with an older target. Older preadolescents display more reactance (Grandpre *et al.*, 2003, Van Petegem *et al.*, 2015); therefore, it is possible that the social labelling tactic works differently and that reattributions require subtler techniques. Furthermore, older adolescents may slowly grow out of the period in which labels reassure them and they seek security in external cues specific to their social development (Chaplin & Roedder John, 2007, Christie & Viner, 2005). Nevertheless, these explanations are only tentative.

Importantly, our results on the moderating role of age enable us to rule out alternative explanations to the social labelling effect such as social desirability or demand effects. Seminal studies on social desirability and children indeed show that social desirability decreases with age. It would be more prevalent in grade 3 children

than in the grade 6 ones, so more identifiable in 8 than in 12 year-olds (Crandall & Crandall, 1965). This is consistent with recent research on internalization process of social behaviours (Kogut, 2012). According to socialization theories (Grusec *et al.*, 2000), 7-8 year old children merely comply with the requests to be approved and appreciated but as they grow older, they consider the behaviour solicited in the norms or values and adoption of the behaviour would be representative of their identities and inherent beliefs (Kogut, 2012). Responses oriented by social desirability and demand effect would therefore be less often observed in older pre-adolescents in comparison to younger ones. Our results go in the opposite direction, as the oldest children in our sample are more responsive than younger ones. This supports the hypothesis of identities enhancement, and rejects social desirability and demand effect as alternative explanations.

Preadolescence is a particularly favourable period to instil new desirable behaviours. This time of development indeed entails the rise in autonomy in many consumption choices (Palan *et al.*, 2010), and children generally prefer goods they have selected themselves (Freeman & Brucks, 2002). However, pressuring children to behave in a specific way can frequently backfire, notably when the pressure comes from paternalistic sources (Goldberg & Gunasti, 2006). It indeed seems that school based-extensive educational programs on sustainability does not always reach the effectiveness expected (Olsson *et al.*, 2016). Therefore, social labelling may work when other educational means fail. It is therefore worth underlying that the intentions to behave measured a week after the exposure to the label spilled over, as they remained significantly eco-friendlier. This suggests that the new behaviours correspond to more profound changes than cosmetic ones.

Offering an extremely simplified protocol, that neither requires cognitive load, nor techniques to trigger a first behaviour, not even a particularly high sensitivity to the cause, we demonstrate that applying social labelling to large audiences of preadolescents is easy and effective for environmental education. Pragmatically, this could be applied by parents or teachers who highlight children's pro-environmental behaviours. The tactic could also be used on a large scale, through (video) games. Children could be invited to play a first round in which some pro-environmental decisions need to be made. Merely offering an "encouraging" score with a clear "label," could spill over into "real" prosocial behaviours. As stresses by Stern (2006) "what we do in the next 10 to 20 years can have a profound effect on the climate in the second half of this century", every small steps count!

Our research therefore yields avenues for further research. Beyond the applications to be tested, there are many additional theoretical aspects that should be investigated. Although this research lends support to the theoretical explanation that self-perception and self-concept is at the root of social labelling, this remains to be empirically demonstrated. Our findings could also be extended by scrutinizing further the framing of labels.

With this research, we aid stakeholders engaged in the design of effective tools to protect the environment and, inch by inch, we contribute to environmental education. Without requiring a revolution in people's behaviours, we add an unconsidered, though relevant, segment of consumers to the current basis of already involved citizens: preadolescents. Beyond the determinant role of preadolescents' current and subsequent consumption and their significant influence over their peers' and families' consumptions, young people's favorable attitudes towards environment (Grønhøj & Thøgersen, 2012, Rios & Menezes, 2017) certainly represent a fertile ground for social

labelling. Yet, it should be considered as a complement to other educational programs, as the latter largely contribute to these positive dispositions. All in all, we believe that this is very promising in a situation that is much in need of effective actions.

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Table 1. Floodlight Analyses

	Self-Rated Pro-environmental Behaviours	
	Index Measured Right After the Manipulation	Index Measured One Week After the Manipulation
Manipulated Variables		
Label	1.72***	1.43
Age (continuous)	.17***	.27***
Label x Age	.19***	.17*
Covariates in the ANCOVA		
Environmental perceptions	.23***	.12
Gender	.01	.19*
Johnson–Neyman point	10 years and 3 months	9 years and 9 months

*p < .10; **p < 0.05; ***p < 0.01 (two-tailed).

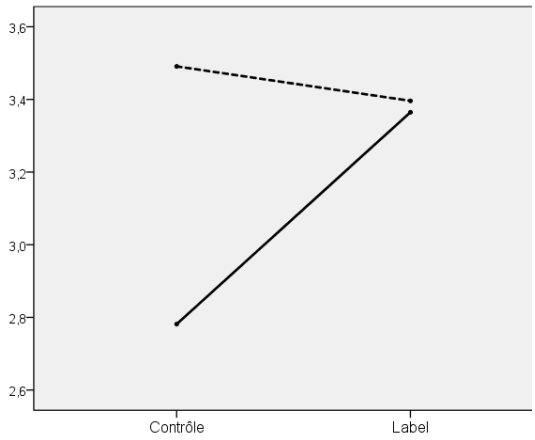
Table 2. ANCOVAs Full Results (F-Ratios)

	Self-Rated Pro-environmental Behaviours	
	Index Measured Right After the Manipulation F(1, 103)	Index Measured One Week After the Manipulation F(1, 107)
Manipulated Variables		
Label	3.02*	5.53**
Age (continuous)	3.50*	10.36***
Label x Age	8.05***	5.32**
Covariates in the ANCOVA		
Environmental perceptions	9.69***	.45
Gender	.03	2.00

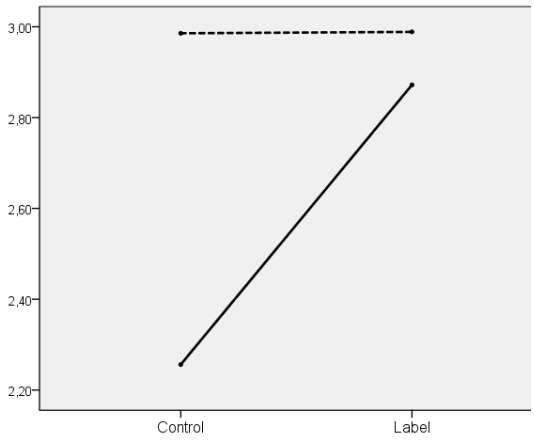
*p < .10; **p < 0.05; ***p < 0.01 (two-tailed).

Figure 1. Interaction between label and age

Self-rated pro-environmental behaviours (index measured right after the manipulation)



Self-rated pro-environmental behaviours (index measured one week after the manipulation)



Key code:

----- older preadolescents

- - - - - younger preadolescents.