



Why young people do things for the environment: The role of parenting for adolescents' motivation to engage in pro-environmental behaviour



Alice Grønhøj*, John Thøgersen

Department of Management, School of Business and Social Sciences, Aarhus University, Fuglesangs Allé 4, Aarhus, Denmark

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ABSTRACT

It is well documented that parents' behaviour and family norms exert a significant influence on young people's pro-environmental attitudes and behaviour. But what is the role of parenting styles in this connection? The present study addresses this question based on a matched sample of young people aged 18–20 ($n = 448$) and one parent ($n = 448$), each completing an online questionnaire that included the Motivation Toward the Environment Scale, Perception of Parenting Styles Scale, and questions about perceived (by youth) parental and self-reported (by youth and parent) pro-environmental behaviours. We find that young people display less internalized motivation to 'do things for the environment' than their parents, but that their motivation to act in pro-environmental ways is rooted in family descriptive norms, parents' internalized motivation to act pro-environmentally, and the autonomy-supporting parenting style and structure prevalent in the home.

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1. Introduction

There is a pressing need for transitions in the systems of production and consumption if we are to live within the ecological limits of our planet. This requires changes in "dominant institutions, practices, technologies, policies, lifestyles and thinking" (EEA, 2015, p. 14). But to which extent the next generation of consumers is motivated to face the challenges connected with the societal changes to more sustainable consumption patterns is uncertain. Studies have shown that environmental concern and the commitment to engage in pro-environmental activities is higher in older versus younger generations (e.g., Grønhøj & Thøgersen, 2009; Wray-Lake, Flanagan Constance, & Osgood, 2010). However, besides studies in environmental education research within the context of formal education (Rickinson, 2001), the processes by which a young person develops the motivation to engage in sustainable modes of action are still relatively unexplored in environmental psychology.

A recent study suggests that learning rather than maturation is responsible for the higher environmental commitment seen in older generations (Otto & Kaiser, 2014). This confirms the

importance of formal sustainability education, but it also suggests a need for increasing young people's exposure to credible information about the state of the natural environment through more informal sources including social media used by the youth (Larsson, Andersson, & Osbeck, 2010). In addition, it attests to the necessity of obtaining a better understanding of what 'parenting for sustainability' might entail, since it is well documented that besides their obvious influence during childhood, parents continue to have a formative role in cultivating responsible citizens well into adolescence (e.g., Steinberg, 2001).

Indeed, studies in the emerging field on pro-environmental consumer socialization of children and adolescents find that parents are important for imparting a pro-environmental orientation to the next generation (Matthies & Wallis, 2015). Through social influence processes, parents influence their children's (Matthies, Selge, & Klöckner, 2012) and teenagers' (Grønhøj & Thøgersen, 2012) environmentally related values, attitudes and behaviour. That the home is an important site for developing environmentally engaged children has also been confirmed by comparative studies in different cultural contexts (Ando, Yorifuji, Ohnuma, Matthies, & Kanbara, 2015). While there has been a growing research interest in young people's pro-environmental actions and agency as consumers and citizens (Larsson et al., 2010), and in the family as a site for pro-environmental consumer socialization (Matthies & Wallis,

* Corresponding author.

E-mail addresses: alg@mgmt.au.dk (A. Grønhøj), jbt@mgmt.au.dk (J. Thøgersen).

2015), the processes by which this learning is transmitted from parents to children are not that well studied. Previous studies have primarily looked at parenting in terms of transmission of social norms in a social learning or modelling tradition (Bandura, 1977). The objective of the present study is to investigate how a pro-environmental outlook may be fostered in the young generation through general styles of parenting. To our knowledge, parenting styles have not previously been linked to pro-environmental consumption (though see Grønhøj & Thøgersen, 2012). More specifically, based on the self-determination perspective (Deci & Ryan, 1985) related to pro-environmental behaviour (Pelletier, Tuson, Green-Demers, Noels, & Beaton, 1998) we propose that an autonomy-promoting parenting style (Grolnick, Deci, & Ryan, 1997) can contribute to the development of internalized motivation to engage in pro-environmental behaviour amongst the youth.

The importance of parents' autonomy support has been shown in other domains, like school performance (Soenens & Vansteenkiste, 2005) and children's health and psychological well-being (Joussemet, Landry, & Koestner, 2008). Although a developmental trajectory of self-determined motivational types has previously been suggested (Renaud-Dubé, Taylor, Lekes, Koestner, & Guay, 2010), the importance of autonomy support for adolescents' internalized motivation to act in an eco-friendly way has, to our knowledge, not received research attention previously. The contribution of this paper is to generate knowledge about the impact of parenting styles on young people's motivation to act in a pro-environmental way, and ultimately on their behaviour, and thereby deepen our knowledge of the roles of parents and parenting in the transition towards a more sustainable society.

2. Self-determined motivation types and pro-environmental behaviour

Self-determination theory (SDT, Deci & Ryan, 1985) has been applied to a number of life domains, such as education, physical activity, and health (Ryan & Deci, 2000), and also for predicting intentions to engage in pro-environmental behaviour (e.g., De Groot & Steg, 2010).

The theory posits that motivation is a multifaceted antecedent of behaviour that can be based on different levels of self-determination. People are more inclined to engage in societally desired behaviours, such as pro-environmental behaviours, when they are driven by self-motivation, rather than being externally requested to act (Thøgersen, 2006). When acting on the basis of autonomous, 'authentic' self-determination, people see themselves as initiators of the given behaviour, whereas extrinsically motivated people engaging in the same behaviour feel controlled and lacking in choice, which is an unstable behavioural basis.

Deci and Ryan (1985) defined six motivational types that differ according to their regulatory styles, loci of causality and corresponding regulatory processes. 'Intrinsic motivation' represents the most self-determined motivation type, characterized by self-regulation processes that are based on the satisfaction, inherent interest and enjoyment a person derives from engaging in the behaviour. At the other end of the continuum, 'amotivation' denotes the situation in which a person feels a lack of control and no intention to act, or acts without intent. Between these two extremes are four different 'external motivation' types. The least autonomous type of externally motivated behaviours is 'extrinsic motivation', describing the situation when a person acts to satisfy an external demand (for instance from parents) or expects a reward for performing the behaviour, implying that the behaviour has an external locus of control. The second, and less extrinsically

controlled motivation is 'introjected motivation,' which involves engaging in behaviours in order to avoid guilt or shame and others' disapproval. 'Identified regulation' is a more self-determined form of extrinsic motivation that involves seeing the action as personally important and part of the personal identity. Finally, the most autonomous form of extrinsic motivation is the 'integrated motivation,' which implies that the behaviours are fully assimilated to the self and in congruence with the person's other values. According to the SDT, internalized and especially intrinsic motivation is affected by a person's perception of own competence and agency, being increased by events that create feelings of competence and agency and reduced by events that question competence and agency (Deci & Ryan, 1985).

Pelletier et al. (1998) adapted the SDT to study people's motivation to act in a pro-environmental way, constructing the motivation toward the environment scale (MTES). Previous studies using the MTES have found that the frequency of engaging in a range of pro-environmental behaviours increases with self-determined motivation for this kind of behaviour (De Groot & Steg, 2010; Pelletier et al., 1998), a finding which has also been found to be valid for the young generation (Renaud-Dubé et al., 2010). Further, it has been found that the relationship between self-determined motivational types and pro-environmental behaviour is stronger for more difficult than for easier pro-environmental behaviours in terms of time, energy and personal resources involved (Green-Demers, Pelletier, & Menard, 1997). For instance, recycling may pose difficulties if options for disposing recyclables are difficult to access and a strong self-determined motivation may be needed to overcome such barriers. Steg and colleagues distinguish between enjoyment-based and duty-based motivation, which are rooted in the desire for hedonic and eudaimonic wellbeing, respectively (Van der Werff, Steg, & Keizer, 2013; Venhoeven, Bolderdijk, & Steg, 2013). They argue that the first type of motivation will rarely be relevant to pro-environmental behaviours, since behaviours such as curtailing electricity use or recycling garbage, are not necessarily interesting or fun to carry out. For a young person, pro-environmental behaviour will often initially be extrinsically motivated based on instruction by parents. However, in addition to engaging in the specific behaviour, a long-term side-effect may be learning the social and societal acceptability of such behaviours, that is, a socialization process. In this process, motivation may become internalized, as initially externally regulated motivation becomes integrated and assimilated to the self, following a course of increased cognitive abilities (Chandler & Connell, 1987). The finding that autonomous environmental motivation is higher in older vs younger adolescents (Renaud-Dubé et al., 2010) also suggests a developmental trajectory of internalizing motivation for pro-environmental behaviours. Hence, it seems that SDT, although not strictly a developmental theory, could be a fruitful basis for shedding light on the processes by which enduring motivation for pro-environmental behaviour is fostered in the young generation. We further suggest that understanding how young people's intrinsic motivation is established and supported is key to fostering a young generation that will engage in pro-environmental behaviour. Specifically, the present study investigates the role of parents in cultivating intrinsic motivation to 'do something for the environment' (cf. Pelletier et al., 1998).

3. Parents' role for children's pro-environmental socialization

Parents are generally believed to affect children's socialization 'outcome' more than anybody else, directly by communicating and

interacting with them and indirectly when children observe and imitate their parents' behaviour (John, 1999). With regard to environmentally significant behaviour, studies find that parents indeed influence their children's behaviour (Ando et al., 2015; Grønhøj & Thøgersen, 2009, 2012; Matthies et al., 2012) and environmental concern (Meeusen, 2014), but that their influence varies between behaviours. For example, Ando et al. (2015) found that parents influenced their children's (approx. 9–10 year olds) waste handling behaviour both directly and indirectly; directly by acting as role models and indirectly through children perceiving their parents to expect them to act in pro-environmental ways, affecting the child's subjective norms. Looking at a similar age group, Matthies et al. (2012) found that parents' own behaviour and praise or sanction were predictive of children's recycling behaviour. For affecting children's re-use behaviour, parents' own behaviour was not effective, but communication raising their children's problem awareness was. The lack of effect of parents' behaviour on the latter might be due to its lower visibility: Whereas children can easily watch their parents recycle, parents' reuse of paper, for example, is much less visible. For a more mature age group, 16–18 year-olds, Grønhøj and Thøgersen (2012) also found support for the parental influence conjecture in relation to sustainable household activities, such as handling waste correctly, purchasing green products and curtailing electricity use. Adolescents tended to model their parents' behaviour in the two former areas, but not with regard to electricity consumption. Similarly, in a study with high school students aged 12–16, De Leeuw, Valois, Ajzen, and Schmidt (2015) found that, besides perceived behavioural control, descriptive norms were important predictors for intentions to engage in eco-friendly behaviour, while injunctive norms were not, confirming that in this context “action speaks louder than words” (Grønhøj & Thøgersen, 2012).

Thus, previous research suggests that parental influence is significant, and that it differs between consumption activities. Social modelling appears only to be effective in guiding children's behaviour if it is visible, but communication about environmental problems can also affect children's pro-environmental behaviour. Further, research into intergenerational transfer of general values, behaviour-specific attitudes and pro-environmental behaviours from parents to adolescents finds stronger correlations with regard to specific pro-environmental behaviour than with regard to more abstract attitudes and values (Grønhøj & Thøgersen, 2009).

It has been suggested that learning by instruction, or in school-format lessons, typically leads to more extrinsic motivation for behaviour, while learning by ‘intent participation’ often fosters more intrinsically motivated behaviour (Rogoff, Paradise, Arauz, Correa-Chavez, & Angelillo, 2003). In the context of pro-environmental behaviour, this implies that parents who engage in sustainable behaviour on an everyday basis and encourage their children to participate as valued family activities not only transmit parental norms, but also provide the opportunity for their children to develop an intrinsic motivation for these behaviours (Matthies et al., 2012). This is a strong argument for including parents more actively in children's pro-environmental socialization, but also for examining the role of intrinsic motivation more closely in relation to formal and informal environmental education.

In this paper, we focus on parents' role when it comes to fostering intrinsic motivation in relation to acting in pro-environmental ways, since parenting styles that promote intrinsic motivation to act in a pro-environmental way have received very little research attention (Grønhøj & Thøgersen, 2012). A related field, children's pro-social development, has been studied much more intensively (Hastings, Utendale, & Sullivan, 1997). Children

may engage in many intrinsically rewarding pro-social behaviours, whereas for other pro-social behaviours parents can assist in structuring an environment that facilitates the internalization of pro-social motivation (Grusec & Davidov, 2006). Key propositions for how parents may facilitate this include autonomy support, that is, providing gentle control and appropriate choice possibilities, structure, that is, setting clear expectations and providing guidance for action, and interpersonal involvement, that is, being warm and caring and showing an interest in the child (Grusec & Davidov, 2006). Other obvious prerequisites for successful pro-social socialization are that children are receptive to their parents' socialization messages, and that parents themselves hold pro-social values (Hastings et al., 1997). Although pro-social behaviour is not identical to pro-environmental behaviour, they are sufficiently similar to expect that similar parenting styles are effective for facilitating autonomous motivation within these two domains. Consequently, we propose that important insights into the roots of young people's pro-environmental behaviours in a family context can be obtained by combining two distinct, but related, strands of research: self-determination theory related to pro-environmental behaviour and socialization theory related to pro-social development.

4. Hypotheses

Our objective is to investigate adolescents' motivation to engage in pro-environmental household activities. Various sources of influence could be potentially relevant, such as school, media, peers and the cultural context, but we focus on the role of parents as primary agents of socialization (John, 1999), and particularly on their importance for fostering societal norms that will be internalized or ‘owned’ by their children (Grolnick et al., 1997; Maccoby, 2007). Our main focus is on the socialization basis for the self-determined motivational types that previous research identified as important for engaging in pro-environmental behaviours (e.g., Pelletier, Green-Demers, & Beland, 1997). In short, we ask: What is the role of parents and parenting in developing internalized motivation for adolescents' pro-environmental behaviour?

Based on prior research and SDT (Deci & Ryan, 1985), especially Pelletier and colleagues' (1998) application of SDT to study motivation to engage in pro-environmental behaviour, we investigate how parents' motivation, their pro-environmental behaviour and their parenting style are related to their children's motivation for pro-environmental behaviour.

First, we motivate our focus with reference to previous research finding that the frequency of pro-environmental behaviour increases with intrinsic motivation (De Groot & Steg, 2010), also among adolescents (Renaud-Dubé et al., 2010). Hence, we hypothesize that a similar result can be expected in the present context, specifically that:

H1. Adolescents' pro-environmental behaviour increases with their self-determined motivation to act in a pro-environmental way.

Next, in line with previous research finding positive correlations between parents' and adolescents' environmental concern, pro-environmental values, attitudes and behaviour (Grønhøj & Thøgersen, 2009; Meeusen, 2014), we expect that also adolescents' and their parents' self-determined motivation is positively correlated:

H2. There is a positive correlation between adolescents' and their parents' self-determined motivation to act in pro-environmental

ways.

Further, in line with prior research finding that adolescents' environmental concern, pro-environmental values, attitudes and behaviour are less pro-environmental than their parents (Grønhøj & Thøgersen, 2009; Meeusen, 2014), and due to the mentioned developmental trajectory of self-determined motivation, we hypothesize that:

H3. Adolescents display less self-determined motivation to act in pro-environmental ways than their parents do.

However, the core of the present research is our proposition that parents influence their adolescent children's motivation to act pro-environmentally in a number of direct and indirect ways. First, we expect that parents' own motivation towards acting pro-environmentally influences how they communicate to their children about these matters and therefore also influences their children's motivation directly, accounting for the correlation between parents' and children's motivation hypothesized above. This relates to the idea that children tend to internalize the values of their social groups, especially their immediate family, facilitated by the feeling of relatedness to the socializing agents (Deci & Ryan, 2000). Second, parents act as models for their children through their own behaviour, which signals descriptive norms to their children (Grønhøj & Thøgersen, 2012). We suggest that parents' behaviour is not only important for the children's learning of what constitute 'normal' behaviour in their family, but also for the motivation they develop towards that behaviour. This is in line with social learning theory (Bandura, 1977), but also with the idea that in order for the adolescent to be receptive for parents' socialization messages, parents must set a good example (Hastings et al., 1997). Third, we expect that parenting styles that are more autonomy supporting will foster children's self-determined motivation, based on the idea that self-determined motivation is cultivated in a communication context that provides choice, direction and agency for the youth (Grusec & Davidov, 2006). Fourth, when parents communicate a direction for pro-environmental behaviour, we expect that this could have two opposing effects on the adolescents' self-determined motivation: it might be perceived as controlling, thus fostering external motivation, or as providing structure and thereby autonomy support:

H4. Adolescents' self-determined motivation to act in pro-environmental ways is not only associated with parents' self-determined motivation to act in a pro-environmental way (cf. H2), but also with (a) how autonomy-supporting the parenting style prevalent in the home is, (b) the extent to which adolescents perceive their parents to act as positive role models for specific pro-environmental behaviours (i.e., the descriptive norms they communicate), and (c) the specific structure imposed by parents related to their children's pro-environmental behaviour.

5. Method

5.1. Participants and design

An online survey was carried out in Denmark by a professional market research company among members of its panel, screened for having adolescents living at home and representative of the population in terms of selected socio-economic background characteristics, such as education and income. Denmark represents a cultural context where sustainability has been a societal priority for years, where sustainable development and pro-environmental 'action competence' are integrated in school curricula (Jensen & Schnack, 1997), and where buying environment-friendly products

is comparatively common (Thøgersen, 2010a).

Two representatives of each family: a parent and an adolescent, each individually completed a questionnaire related to environmentally significant everyday household activities: curtailing electricity use, buying environmentally friendly products and sorting waste. The aim was to include environmentally relevant activities for which we could be reasonably certain that both parents and adolescents would be involved. The final sample consisted of 2×448 parents and children (in pairs), a total of 896 respondents. The adult sample consisted of 40% fathers, while in the adolescent sample there was an equal split between sons and daughters. The mean age of the youth was 18.4, ranging from 17 to 20 years, while the mean age of parents was 49, ranging from 37 to 62 years.

5.2. Procedure

The adolescent respondents answered questions about: Perception of parenting (POPS, Grolnick, Ryan, & Deci, 1991); Perception of parents' pro-environmental behaviours; Self-reported pro-environmental behaviour; Parental provision of guidance and structure with regard to their performance of pro-environmental behaviour and; Motivation towards the environment (MTES, Pelletier et al., 1998) in the mentioned order. Parents also completed the MTES and both parents and adolescents responded to other questions that were not used for this purpose.

5.3. Measures

5.3.1. Motivation towards the environment scale

The youth and one of their parents answered 18 questions aimed at capturing a variety of reasons for acting in environmentally friendly ways. The items were translated and adapted from the MTES scale developed by Pelletier et al. (1998). The scale measures the six motivational types proposed by SDT, applied to pro-environmental activities, that is, the extent to which they are performed for intrinsic, self-motivated reasons at one extreme, or not carried out at all due to amotivation at the other. To make it easier to answer for young people, we used a portrait-based response format originally employed in values research (Schwartz et al., 2001). The participants were asked to respond on a 6-point rating scale to descriptions of a person having different motivations for environmental protection (1 = 'is very similar to me' to 6 = 'is almost the opposite of me'). The six dimensions were each measured by three items, and the descriptions were preceded by the following instruction: "You can protect the environment in many different ways, for instance by curtailing electricity, sorting the garbage, or by buying environmentally friendly products. In the following we describe different reasons why a person would protect the environment. Please read each description and consider how much the person is similar to or not similar to yourself". For each description, the request was to respond to the question: 'How much is this person like you?' For example, one description used to tap into intrinsic motivation read: 'S/he sees a pleasure in improving the quality of the environment¹.' As reported later (Table 2), the four types of internalized motivation are strongly correlated. Therefore, they were merged to a single "internalized motivation" construct for the following analyses. The final MTES subscales possess acceptable construct reliability for five out of six subscales (Cronbach's Alpha, parents: amotivation/external/internalized = 0.90/.73/.94; youth: amotivation/external/internalized = 0.89/.61/.93). The youth/external motivation subscale was lower than what is

¹ See Appendix A for the list of MTES items used.

normally acceptable but we retained the scale in its original form to stay consistent with past research.

5.3.2. Autonomy support

The youth responded to a translated version of the perception of parents scales (POPS College–Student version, [Grolnick et al., 1991](#)). The scale assessed the adolescents' perceived autonomy support, using a subscale of five items from the original scale: (1) My mother/father, whenever possible, allows me to choose what to do. (2) My mother/father listens to my opinion and perspective when I've got a problem. (3) My mother/father allows me to decide things for myself. (4) My mother/father is usually willing to consider things from my point of view. (5) My mother/father helps me to choose my own direction. They were requested to respond to these statements about their mother or father (adapted to fit to the gender of the parent responding to the adult part of the questionnaire) on a 7-point rating scale, with responses ranging from 1 = not true at all to 7 = very true. Perceived autonomy support possesses acceptable construct reliability (Cronbach's Alpha = 0.81).

5.3.3. Descriptive norms

Descriptive norms were measured by asking the youth to respond to their perception of their parents' involvement in three everyday pro-environmental behaviours: (a) source-separating waste, (b) buying organic or environment-friendly products, and (c) saving electricity. The youth were asked to respond to a total of six questions about perception of parents' behaviour: "How often does your mother, respectively, father sort the waste correctly? "How often are the products your mother, respectively, father buys organic or environmentally friendly?" and "How often does your mother, respectively, father make an effort to save on electricity consumption at home?" Responses were measured on a 5-point scale from 1 = always to 5 = never. The descriptive norms variable possesses acceptable construct reliability (Cronbach's Alpha = 0.72).

5.3.4. Perception of parental structure

To measure the extent to which parents conveyed clear expectations and structure for youth to act eco-friendly, two questions were asked: "How often does your mother, respectively, father ask you to act in environmentally friendly ways in your everyday behaviour?" Responses were measured on a 5-point scale from 1 = always to 5 = never. The variable possesses acceptable construct reliability (Cronbach's Alpha = 0.77).

5.3.5. Pro-environmental behaviour

The pro-environmental behaviours chosen were every-day activities that both parents and children would have the possibility to be engaged in. The youth were asked to respond to questions regarding their own involvement in three behaviours (source-separating waste, buying organic or environmentally friendly products, saving electricity), and with the same response options as was given for subsequent questions of the perception of their parents' behaviours. However, since the three behaviour items were not very strongly correlated (r 's from 0.21 to 0.23) they did not form a reliable construct (Cronbach's Alpha = 0.45). Hence, they were treated as separate behaviour variables in the following analyses.

6. Results

We used simple pairwise (Pearson's) correlation analyses and t -test (paired samples) to test Hypotheses 2 and 3, while confirmatory factor analysis (CFA) and structural equation modelling (SEM)

were used to test the remainder of the hypotheses. The latent constructs included in the SEMs possess construct and discriminant validity as documented by the reliabilities reported above, by their largest bivariate correlation (between adolescents' internalized motivation and amotivation) being $|0.55|$, that is, far below 1.00 ([Bagozzi & Yi, 2012](#)), and by the square root of the average variance extracted (AVE) for each construct being substantially greater than the correlations between a construct and all other included constructs ([Nebojsa, 2014](#))².

6.1. Correlation analyses and t -tests

As expected, the adolescents' and their parents' motivation types are positively and significantly correlated, as predicted by Hypothesis 2, see [Table 1](#). The only exception is external motivation.

As predicted by Hypothesis 3, we find that the mean scores on all motivation types differ significantly between generations and that parents score higher than adolescents on all the internalized motivation types, while adolescents score higher than their parents on both external motivation and amotivation.

6.2. Confirmatory factor analysis and structural equation modelling

Further data analysis and hypotheses tests were done by means of CFA and SEM using AMOS 22 ([Arbuckle, 2006](#)). In SEM, the measurement model is a CFA model and the theoretical constructs are latent factors extracted from the manifest variables ([Bagozzi, 1994](#)). The main advantage of SEM is that it is possible to explicitly account for measurement error when a latent variable of interest is represented by multiple manifest variables. Measures of how well the implied variance-covariance matrix, based on the parameter estimates, reflects the observed sample variance-covariance matrix can be used to determine whether the hypothesized model gives an acceptable representation of the analysed data. In the analyses reported below, the usual assumptions about a simple structure factor pattern in the measurement model and uncorrelated item error terms were applied.

6.2.1. Confirmatory factor analyses of the MTES

Bivariate correlations between the latent MTES constructs based on CFA are shown in [Table 2](#), separately for parents (above the diagonal) and children (below the diagonal). The fit indices show that the CFA models for both parents and children give an acceptable representation of the data. As expected, amotivation is negatively correlated with all internalized motivation types and external motivation is weakly correlated with both internalized motivation types and amotivation, for both parents and children.

The CFA revealed that all the internalized (i.e., the intrinsic, integrated, identified and introjected) motivation types, but not external motivation and amotivation, are strongly correlated (i.e. > 0.83), which questions their discriminant validity and specifically is bound to lead to multicollinearity if these constructs are used as independent variables in the same model. Therefore, we decided to merge them into a joint "internalized motivation" construct for the SEM analyses. The merged "internalized motivation" scale also correlates positively and significantly ($r = 0.35$) between parents and their adolescents and the difference in means between generations is highly significant ($t = -11.36$, $p < 0.001$).

6.2.2. Structural equation modelling

6.2.2.1. *Motivation.* The first SEM analyses the relationships

² The latter are not reported for reasons of space, but they can be acquired from the authors.

Table 1
Motivational types: Parent-child similarities and differences.

Motivation	Means (Standard deviations)		r	t	Cronbach's alpha	
	Youth, N = 448	Parents, N = 448			Youth	Parents
Intrinsic	3.74 (1.09)	4.36 (1.01)	0.30**	-8.49**	0.841	0.844
Integrated	3.36 (1.20)	4.18 (1.19)	0.33**	-10.11**	0.847	0.870
Identified	4.24 (1.07)	4.77 (0.91)	0.34**	-7.80**	0.844	0.882
Introjected	3.56 (1.11)	4.07 (1.04)	0.23**	-6.37**	0.795	0.725
External	2.84 (0.87)	2.50 (0.86)	0.10	4.87**	0.612	0.725
Amotivation	2.16 (1.04)	1.83 (0.86)	0.37**	4.95**	0.892	0.895

1 = low–6 = high. ***p < 0.001, **p < 0.01, *p < 0.05.

Table 2
Correlations between MTES motivation types for parents (above the diagonal) and children (below the diagonal), based on CFA.

	Intrin.	Integ.	Identi.	Introj.	Ext.	Amo.
Intrinsic		0.93	1.01	0.98	0.04	-0.55
Integrated	0.86		0.92	0.91	0.03	-0.48
Identified	0.99	0.85		0.96	-0.05	-0.58
Introjected	0.94	0.84	0.96		0.08	-0.46
External	0.39	0.47	0.37	0.44		0.44
Amotivation	-0.54	-0.41	-0.61	-0.51	0.11	

Note: Parents: Chisquare = 450.050, 120 df., CFI = 0.94, RMSEA = 0.076 (90 pct. Confidence interval: 0.069–0.084). Children: Chisquare = 603.340, 120 df., CFI = 0.92, RMSEA = 0.092 (90 pct. Confidence interval: 0.085–0.100).

between adolescents' self-determined motivation to act in pro-environmental ways and its hypothesized antecedents: (a) parents' self-determined motivation (cf. H2), (b) the autonomy supporting parenting style prevalent in the home (Hypothesis 4a), (c) the extent to which adolescents perceive that parents act as positive role models for the desired pro-environmental behaviour (Hypothesis 4b), and (d) the specific structure imposed by parents

Table 3
Structural equation model predicting adolescents' motivation to act in a pro-environmental way.

	B	Std. Error	Beta	P
<i>Internalized motivation</i>				
PInternalized	0.30	0.06	0.28	<0.001
PExternal	-0.07	0.12	-0.04	0.394
PAmotivation	0.19	0.09	0.14	0.047
PStructure	0.26	0.09	0.24	0.003
PBehavior	0.36	0.14	0.22	0.012
PAutSupport	-0.11	0.05	-0.11	0.014
Gender	-0.34	0.08	-0.17	<0.001
<i>External motivation</i>				
PInternalized	0.11	0.04	0.24	0.004
PExternal	0.16	0.07	0.20	0.026
PAmotivation	-0.01	0.05	-0.01	0.636
PStructure	0.18	0.05	0.40	<0.001
PBehavior	-0.08	0.08	-0.12	0.215
PAutSupport	0.01	0.03	0.02	0.048
Gender	0.07	0.05	0.08	0.098
<i>Amotivation</i>				
PInternalized	-0.09	0.06	-0.10	0.090
PExternal	-0.09	0.12	-0.05	0.301
PAmotivation	0.33	0.09	0.28	<0.001
PStructure	0.08	0.08	0.08	0.225
PBehavior	-0.30	0.14	-0.21	0.027
PAutSupport	0.11	0.04	0.13	0.001
Gender	0.19	0.08	0.11	0.018

Note: "P" in an antecedent label refers to "parents". The three parent motivation types are reported by a parent, whereas the rest of the P constructs reflect the child's perception of the parent variable. Notice that a higher score means less of that type of motivation. Gender: 1 = boy, 2 = girl. R²(Amotivation) = 0.22, R²(External) = 0.24, R²(Internalized) = 0.33. Chisquare = 1074.816, 361 df., CFI = 0.91, RMSEA = 0.065 (90 pct. Confidence interval: 0.060–0.069).

related to their children's pro-environmental behaviour (Hypothesis 4c). In addition, we controlled for included demographic background characteristics (gender, age, parents' income). Table 3 reports the results of this SEM analysis, predicting each of the three motivation types for adolescents.

As predicted, there is a stronger association between adolescents' specific types of motivation to act in a pro-environmental way with their parent's motivation of the same type than with the parent's other types of motivation. A partial exception is children's external motivation, where the positive relationship is stronger with parents' internalized motivation. Also, when parents demonstrate environmental responsibility in their own behaviour this is positively related to the child's internalized motivation (and a negatively related to amotivation), as predicted by Hypothesis 4b. Parental structure to act in a pro-environmental way is positively related to external motivation in the child, but it is also positively related to internalized motivation, as predicted by Hypothesis 4c. Finally, an autonomy-supporting parenting style is positively related to the child's self-determined motivation to act in a pro-environmental way (and negatively to amotivation) when all the other mentioned variables are controlled, as predicted by Hypothesis 4a³. In addition, and not predicted, there is a gender effect: Girls tend to be more internally motivated than boys, and boys tend to be more amotivated than girls⁴. All in all, and in line with Hypothesis 2, our results support a significant intergenerational transfer when it comes to the degree of self-determined motivation to do something for the environment.

6.2.2.2. Behaviour. To test Hypothesis 1 and investigate the behavioural implications of young people's internalization of pro-environmental motivation, the second SEM analyses the relationships between adolescents' motivation to act in a pro-environmental way and three everyday pro-environmental behaviours: (a) source-separating waste, (b) buying organic and environment-friendly products, and (c) saving electricity.

Table 4 shows that adolescents' pro-environmental behaviour is indeed positively related to how self-determined (i.e., internalized)

³ It is also reasonable to expect that the positive association between an autonomy-supporting parenting style with adolescents' motivation to act in a pro-environmental way depends on the directions provided by the parents' motivation. To explore this, as suggested by one reviewer, we conducted a multi-group SEM analysis using parents' internalized motivation, split at the mean, as grouping variable, and this analysis confirmed this expectation. Specifically, we found that, when restricting structural paths from parenting style to adolescents' motivation to be equal across groups, the fit of the model significantly worsened ($\Delta\text{Chisquare} = 17.176$, 3 df, $p < 0.01$). Further, there is only a significant, positive association between parenting style and adolescents' internalized motivation when parents' own internalized motivation is high ($\text{beta} = -0.35$, $p < 0.001$), and in addition there is a significant association in the opposite direction with respect to adolescents' amotivation ($\text{beta} = 0.35$, $p < 0.001$). (Notice, that a negative sign means a positive association, and vice versa, as explained in the note to Table 3.)

⁴ The nonsignificant background characteristics are not included in Table 4. We deleted them and ran the analysis again.

Table 4

SEM analysis of the relationships between adolescents' motivation to act in pro-environmental ways and (a) source-separating waste, (b) buying organic or environment-friendly products, and (c) saving electricity.

	B	S.E.	Beta	P
<i>Waste</i>				
Internalized	0.39	0.11	0.29	<0.001
External	-0.04	0.23	-0.01	0.862
Amotivation	-0.21	0.11	-0.14	0.047
<i>Green buying</i>				
Internalized	0.54	0.12	0.35	<0.001
External	0.09	0.26	0.03	0.722
Amotivation	-0.16	0.12	-0.09	0.183
<i>El-saving</i>				
Internalized	0.47	0.08	0.49	<0.001
External	-0.45	0.17	-0.20	0.009
Amotivation	-0.01	0.07	-0.01	0.943

$R^2(\text{Waste}) = 0.14$, $R^2(\text{Buying}) = 0.17$, $R^2(\text{EI}) = 0.20$. $\chi^2 = 225.193$, 53 df., CFI = 0.95, RMSEA = 0.083 (90 pct. Confidence interval: 0.072–0.094).

their motivation to act in an environmentally friendly way is. All three behaviours are strongly and positively associated with their internalized motivation. After controlling for internalized motivation, external motivation and amotivation are only significantly related to one behaviour each. Amotivation is negatively associated with adolescents' waste handling behaviour, and external motivation is negatively associated with their electricity saving. Hence, only motivation that is internalized seems to have a positive impact on adolescents' behaviour⁵.

7. Discussion and conclusions

Pro-environmental concern and behaviour are influenced by a complex interplay between personal, social, economic and contextual antecedents (e.g., Gifford & Nilsson, 2014), but hardly anyone contests that parents and family has a prominent role to play in establishing a base for environmental concern and action through childhood and adolescence. It is crucial to expand our knowledge of what motivates young people towards pro-environmental behaviour, as this has direct, practical implications for creating a sustainable future (UNEP, 2011).

In this paper, we have explored how parents may influence self-determined motivation to act pro-environmentally. This is important not least since autonomous self-determination has been found play an important role for acting pro-environmentally (De Groot & Steg, 2010; Joussemet et al., 2008). First, we found that descriptive

⁵ The two SEM analyses suggest mediated influences of the identified antecedents of motivation (Table 3) on adolescents' pro-environmental behaviour. We tested if all behavioural associations of these antecedents are mediated, or if any of them are directly related to behaviour after controlling for adolescents' motivation, using hierarchical SEM analyses. In these analyses, identified antecedents' possible direct association to behaviour was either fixed to 0 or set free to vary while their mediation paths through the adolescents' motivation constructs were controlled. For some antecedents, the direct relations to adolescents' pro-environmental behaviour could be fixed to 0 without a worsening of the model fit: (1) gender ($\Delta\chi^2 = 5.783$, 3 df., $p = 0.123$), (2) parents' motivation ($\Delta\chi^2 = 13.654$, 9 df., $p = 0.135$), and (3) parenting style ($\Delta\chi^2 = 7.116$, 3 df., $p = 0.068$). However, direct behavioural relations to parental structure ($\Delta\chi^2 = 11.731$, 3 df., $p < 0.01$) and perception of parents' behaviour ($\Delta\chi^2 = 184.557$, 3 df., $p < 0.001$) remain after controlling for adolescents' motivation. Parental structure is significantly and directly related to adolescents' recycling (beta = 0.18, $p < 0.01$) and perception of parents' behaviour is directly related to adolescents' recycling (beta = 0.71, $p < 0.001$) and green buying (beta = 0.33, $p < 0.001$). The association between perception of parents' behaviour and adolescents' recycling is strong enough to suppress the association between the adolescent's own internalized norm and recycling to insignificance (beta = 0.05, $p = 0.454$).

norms for pro-environmental behaviour, as reflected in adolescents' perception of their parents' pro-environmental behaviour, are important, not only for learning about 'normal' and expected types of behaviour in one's family, but also for developing motivation towards that behaviour. This is one of the basic tenets of social learning theory (Bandura, 1977), but it is also in line with the idea that in order for adolescents to be receptive for parents' socialization messages, parents must take leadership, set a good example and be seen to engage in the desired behaviour themselves (Grønhoj & Thøgersen, 2012). Next, we found that parents' own motivation towards acting pro-environmentally is associated with their children's motivation to act. Third, an autonomy supporting parenting style was found to play a significant role for adolescents' motivation to act as well, presumably because more self-determined motivation is cultivated in a communication context that provides choice, direction and agency for the youth (Grusec & Davidov, 2006). Fourth, providing structure by setting a direction and clear expectations also seems to enhance autonomy support for pro-environmental behaviour, increasing the adolescents' self-determined motivation. Finally, and in line with previous research (De Groot & Steg, 2010; Pelletier et al., 1998), this study confirms that internalized motivation is important for engaging in different pro-environmental behaviours also for our young target group. Hence, we found support for all the expected relationships and for the importance of parenting for cultivating self-determined motivation to act in pro-environmental ways. However, it is a limitation that cross-sectional data was used, which means that the study is mute about the direction of causality with regards to the tested determinants and adolescents' self-determined motivation. With this reservation in mind, this study suggests that parents can nourish their children's motivation to act by: (1) letting them observe that they engage in pro-environmental household activities (descriptive norms), (2) possessing self-determined motivation towards 'doing things for the environment', (3) providing for a communication environment conveying choice and agency for the young person to act (autonomy support), (4) providing structure and setting expectations with regard to the preferred mode of pro-environmental action.

Finding positive associations between parents' descriptive norms and self-determined motivation and adolescents' self-determined motivation is perhaps not a huge surprise, given the previously established links between parents' and adolescents' pro-environmental attitudes, values and behaviour (e.g., Grønhoj & Thøgersen, 2009). Still, it does suggest that young people do not copy their parents' behaviour mechanically, but develop motivation towards behaviour observed on an everyday basis. However, it cannot be taken for granted that the presumed effect of perceived parental behaviour and parents' self-determined motivation is equally pronounced for younger age groups.

Our findings also suggest that parents can encourage pro-environmental autonomous motivation through the communicative context they provide at home. When providing autonomy support, the goal is to foster autonomous self-regulation rather than mere compliance. For interesting activities, this is an easy task since (young) people will have intrinsic motivation to pick these up by themselves, but when the tasks are not inherently enjoyable, which will often be the case for pro-environmental activities, supporting young people's autonomy in order for them to internalize the targeted behaviour takes a more pro-active form (e.g., Grolnick et al., 1997; Joussemet et al., 2008). In practice, this means that parental guidance is needed to remind the child or young person of the expected behaviour. It can be assumed that the age group included in this study is well aware of parental expectations and has internalized the expected behaviour through guidance received throughout childhood, and that only occasional prompts

are needed to remind them of desired behaviours. Indeed, our study supports the idea that such reminders can have a positive effect on the young people's internalized motivation, indicating that parental structure serves to build or maintain pro-environmental motivation. However, explicit parental requests appear to have an even bigger effect on the young people's external motivation. It is possible that such requests are received differently by different young people; some may perceive them as controlling and restricting freedom of choice, while others may perceive them as well-meant reminders. For such reminders to be successful, it is most likely a prerequisite that parents 'practice what they preach' (e.g., Grønhøj & Thøgersen, 2012) and that they themselves endorse pro-environmental values (Hastings et al., 1997). Other factors, including the quality of the parent-child relationship, could have an influence as well, and future studies should examine such factors.

The study has been conducted in a cultural context where the connection between environmental problems and private consumption is relatively salient (Thøgersen, 2010b) and where, for instance, the market share for organic food products is the highest in the World (Juhl, Fenger, & Thøgersen, 2017). However, although the frequency of pro-environmental purchases may be higher among parents and their children in Denmark, we have no reason to suspect that the psychological influence processes found in this study depend on the cultural context. Future research in different cultural and national contexts may settle this question conclusively.

The findings of this study have obvious implications for 'parenting for sustainability'. The results strongly suggest that parents can pave the way for their children's pro-environmental involvement, not only by setting a good example by engaging in, for example, buying eco-friendly products and carefully sorting the household waste, but also by communicating expectations about desired behaviours. The results further emphasize that such expectations should be communicated in a way which is not

controlling, but instead facilitates choice and agency. Admittedly, this is not necessarily an easy parenting task. Notably, we found that parental requests to act more sustainably affect internalized, but also external motivation. Importantly, parental requests do not seem to create amotivation, suggesting that gentle parental reminders would not make adolescents *less* motivated.

The findings of the study also point to opportunities to study the developmental trajectories of the motivational types in childhood and adolescence. The target group for this study was quite mature and extending this research to younger groups could provide valuable information with regard to parental opportunities to support their children's informal, pro-environmental development. Important, unresolved questions include, for instance, whether young children also benefit from increased autonomy support and whether clear instructions are productive or undermining self-determination in young children. In addition, longitudinal studies would be valuable to discover how, and if, 'parenting for sustainability' has a long-term effect. Finally, it would be fruitful to take a look beyond private consumption and explore the role of informal pro-environmental socialization, mediated through internalized motivation, for young people's future support for more radical, and perhaps more effective, green policies.

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Appendix A. Questionnaire items measuring motivation towards the environment (MTES, adapted from Pelletier et al., 1998)

Intrinsic Motivation
1) S/he sees a pleasure in improving quality of the environment
2) S/he sees a pleasure in mastering new ways to protect the environment
3) S/he likes the feeling when doing things for the environment
Integrated Regulation
1) S/he considers taking care of her/himself and the environment as inseparable
2) Taking care of the environment has become part of the way s/he has chosen to live her/his life
3) Taking care of the environment has become a fundamental part of who s/he is
Identified Regulation
1) S/he thinks it is a sensible thing to try to care for the environment
2) S/he thinks it is a good idea to do something for the environment
3) S/he has chosen to contribute to a better environment by doing something her/himself
Introjected Regulation
1) S/he would feel bad if s/he didn't do anything for the environment
2) S/he thinks she would regret not doing something for the environment
3) S/he cares for the environment because she would feel guilty not doing it
External Regulation
1) S/he cares for the environment to avoid being criticized
2) S/he cares for the environment because her/his family thinks s/he should
3) S/he thinks others would be upset if s/he did not care for the environment
Amotivation
1) S/he doesn't know why she should do something for the environment, s/he doesn't see how it helps
2) S/he cannot see why she should do something for the environment, s/he has the impression s/he's wasting time
3) S/he doesn't know why s/he should care for the environment, s/he can't see what s/he is getting out of it

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