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The Elusiveness of Communicative Influence: How Key Socializers Influence Adolescents' Proenvironmental Engagement

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The focus of this study is communicative influence—words of encouragement and persuasion—and its role in young people's proenvironmental engagement. It offers a holistic understanding of adolescents' social context by studying communicative influence from three key socializers at once: parents, friends, and teachers. The study also contributes a longitudinal perspective by investigating behavior change over time in adolescents with different extents of communicative influence. Finally, the validity of the measurement of communicative influence is put to the test. The findings confirm the prominent role of parents in adolescents' proenvironmental engagement, but also reveal that adolescents tend to misinterpret communicative influence from parents in line with their own environmental beliefs. Young people with two or more sources of encouragement are the most environmentally engaged; however, the extent of communicative influence does not increase their probability of being more engaged one year later.

Keywords: proenvironmental behavior, environmental engagement, adolescents, environmental communication, climate change

The mounting evidence of human impact on the planet's climate makes responsibility for addressing climate change young people's burden. This propels parents and other adults significant in adolescents' lives to socialize children into more environmentally conscious practices such as recycling; saving energy; and choosing organic food, earth conscious clothing, and public transport over private cars.

Indeed, adolescence is a formative period during which past experiences and current ideals are integrated into an evolving identity (Erikson, 1968). A number of factors contribute to young people's concern for natural environments: memorable childhood play experiences in nature (Bixler, Floyd, & Hammitt, 2002) and influence from the key socializers such as parents, friends, and teachers, from whom they learn to be more environmentally aware. Adolescents can be influenced by others in many ways: through observation of others' behavior, through communication, or because of a need to comply with significant others' expectations. The importance of communication for transmission of values and behavior has long been recognized in political communication research (Jennings & Niemi, 1981). Discussions about political events at home foster children's attention to political and social issues (Flanagan, 2013); they are

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also viewed as an important transmission strategy for helping young people internalize certain values (Schönpflug, 2001).

Proenvironmental values are no exception. There is empirical evidence that communication with parents (Meeusen, 2014), friends (Stevenson, Peterson, & Bondell, 2016), and in school settings (Duarte, Escario, & Sanagustín, 2017) plays a positive role in the development of environmental concern and adoption of proenvironmental practices among adolescents. The communicative influences (i.e., the words of encouragement and persuasion) in those studies were commonly measured through adolescents' self-reports of their perceptions of the intentions of others. However, in those studies that employed different measurement, through the reports of parents or friends, no support was found for the transmission of proenvironmental values and behavioral practices (Collado, Evans, & Sorrel, 2017; Leppänen, Haahla, Lensu, & Kuitunen, 2012).

The goal of this study was, thus, to explore the concept of communicative influence and to establish its role in adolescents' proenvironmental engagement. To do so, I act as devil's advocate: I first explore the phenomenon of communicative influence and establish its role in adolescents' environmental engagement; then I challenge my findings by using different measurements of communicative influence. In the first part, I review the existing research on the role of key socializers—parents, friends, and school—in adolescents' engagement with environmental issues and their relative importance. In the second part, I empirically test whether adolescents who experience communicative influence from different socializers, as measured through their self-reports, differ in their engagement. Going one step further, in the third part I empirically challenge the validity of adolescents' self-reports on communicative influence from different socializers by comparing the adolescents' and their parents' perceptions of the influence. Finally, I discuss the importance of the social context in research on communicative influence and the validity of the available measurements.

The Role of the Key Socializers in Adolescents' Environmental Engagement

Defining Proenvironmental Engagement in the Context of Adolescents

There are different ways of how one can engage with environmental issues—from recycling and choosing eco-friendly products to environmental activism and membership in environmental organizations. For adolescents—the object of this study—because of their age, political activism provides a rather limited range of actions, and therefore everyday proenvironmental practices may become a meaningful way to engage with these issues. Everyday proenvironmental behavior can be a sign of commitment to a certain lifestyle. Behaviors that become settled during adolescence form particular "material, social and spatial organizational settings" (Büttner & Grübler, 1995, p. 119), which can be difficult and costly to change later in life. Yet, these behaviors can also result from a family habit or convenience (e.g., living close to school might explain the choice of using a bike and not a car). Hence, to be engaged, one should also find proenvironmental behavior meaningful and consistent with one's values. In other words, adolescents need to express concern for the environment and adopt environmental values. The problem with environmental issues, however, is that it is not entirely obvious why one has to sacrifice comfort (e.g., using public transport instead of a personal car) or make an effort (e.g., finding space for six rubbish bins at home and making one's way to recycling stations, preferably not by car) if this will have no direct impact on the planet's

climate. A single individual's contribution to the mitigation of climate change will not make a significant impact. Therefore, for adolescents to be committed to proenvironmental values and practices, they need to believe in the importance of their contribution in a broader context of other committed individuals. Efficacy beliefs are the core beliefs for human agency (Bandura, 2009). Thus, in this article proenvironmental engagement is understood as a sum of proenvironmental everyday behavior, proenvironmental values that reflect concerns for the environment, and environmental efficacy.

Literature Review

Interpersonal influence primarily consists of the impact of a person acting to persuade, convince, or influence others with the aim of having a specific effect (Cheah & Phau, 2011). Effects can vary from increased awareness of certain artifacts or practices or behaviors of others to integration of the meaning of practices or artifacts into self-concept (Axsen & Kurani, 2014). According to Bandura (1986), family, peers, and other influencers can convey information and activate emotional reactions through modeling, instructions, and social persuasion. This study focuses on social persuasion, and what follows is an overview of empirical evidence of interpersonal influences on adolescents' environmental engagement from the key socializers: parents, friends, and school.

Parents

Several studies have found similarities between adolescents' and their parents' environmental concern (Casaló & Escario, 2016; Meeusen, 2014), efficacy (Mead et al., 2012), and proenvironmental behavior (Grønhøj & Thøgersen, 2012). These similarities led the researchers to conclude that there is an intergenerational transmission of proenvironmental values powered by discussions about environmental issues between children and parents (Meeusen, 2014; Valdez, Peterson, & Stevenson, 2018). Communication plays the role of mediator between parental concern and children's concern (Meeusen, 2014). In general, children who talk about environmental issues at home show higher levels of concern (Eagles & Demare, 1999; Stevenson et al., 2016) and are more inclined to seek information about climate change (Mead et al., 2012). Stevenson et al. (2016) concluded that discussions even with perceived skeptics may build concern about climate change.

Friends

Friends often inspire proenvironmental attitudes in young people. Several studies have provided empirical evidence that young people's attitudes toward various environmental issues are positively related to their friends' attitudes (Collado, Evans, & Sorrel, 2017; Gotschi, Vogel, Lindenthal, & Larcher, 2009). Participation in a community of like-minded peers motivates young people to learn about their ecological footprint and to do more to limit it (Robelia, Greenhow, & Burton, 2011). In another study of college students, a different role of peers emerged. Yang, Kahlor, and Griffin (2014) discovered that concerns about one's social standing among one's peers played a significant role in the decision to share environmental information. Those who viewed obtaining climate-change information as a socially popular behavior were more willing to share this information with others. Yet, when the roles of parents and friends were investigated in the same analysis, interactions with family, rather than with peers, turned out to be more

important in developing concern about climate change (Collado, Staats, & Sancho, 2017; Stevenson et al., 2016) and purchasing organic products (Gotschi et al., 2009).

School

In the school setting, peers seem to play an important role as well. The analysis of European youth by Duarte et al. (2017) indicates that students' environmental values are positively associated with the average environmental values of their grade-school peers. Through guided discussions in the classroom, pupils tend to help each other construct a shared understanding of climate change (Ohman & Ohman, 2013). In addition to peer interactions, communication with teachers contributes to adolescents' feelings of hope, which in turn were positively related to proenvironmental behavior if the adolescents perceive teachers as communicating in a solution-oriented and positive way (Ojala, 2015).

Thus, communication with all three socializers seems to be influential for young people's engagement with environmental issues. In a study that looked at multiple social aspects, Duarte et al. (2017) concluded that adolescents' concerns for the environment were a result of a complex interplay of social factors: family background, school characteristics, school programs, and social interactions with peers. They concluded that some of these factors can act as "social multipliers"; for example, the impact of the school campaign on individual attitudes to environmental problems can be reinforced by a change in peer attitudes (Duarte et al., 2017). This suggests that it is necessary to look at the social context of adolescents in its totality to understand the effectiveness of influence from a single socializer. Hence, this study contributes to a more holistic understanding of the communicative influence on adolescents' proenvironmental engagement by paying attention to three socializers at once —parents, friends, and teachers—and their role in encouraging adolescents to become more aware of environmental issues. By identifying different types of young people in terms of the communicative influence from the key socializers to which they are exposed, I answer the first research question:

RQ1: How do adolescents with different sources of communicative influence differ in their proenvironmental engagement?

Even if we know that adolescents who experience communicative influence from various sources differ in their proenvironmental engagement, this does not necessarily mean that young people are engaged to a greater or lesser extent because their parents, teachers, or friends talk to them and encourage them to be more aware of environmental issues. The direction of causality may, as well, be the opposite: Those who are more engaged are also more open to conversations about environmental issues and may initiate such discussions. Therefore, I used a longitudinal design to better understand whether different patterns of communicative influence have different consequences for the adolescents' proenvironmental engagement in the future:

RQ2: What patterns of communicative influence increase the probability of adolescents' proenvironmental engagement one year later?

Finally, I address the most interesting question—how well do we understand communicative influence?—by looking at different measurements of it. Social psychological research has long shown that people often tend to overestimate or underestimate the behavior, values, or approval of their reference group based on their own attitudes and behavior (Cialdini, Trost, & Newsom, 1995; Schul & Vinokur, 2000). For instance, studies with a focus on intergenerational transmission of environmental concern came to different conclusions depending on what measures were used. In the studies that found similarities between adolescents' and their parents' environmental concern, the conclusions rested on weak (Grønhøj & Thøgersen, 2009) or at best moderate associations (Casaló & Escario, 2016; Grønhøj & Thøgersen, 2012; Meeusen, 2014). When parental reports were used instead, no consistency in environmental attitudes between parents and children was found (Collado, Evans, & Sorrel, 2017; Leppänen et al., 2012). One study addressed this methodological problem. Collado, Evans, and Sorrel (2017) examined the role that parents and peers have in the regulation of adolescents' behaviors using both adolescents' perceptions of relevant others' behavior and others' self-reported behavior. They did not find any serious inconsistency and concluded that adolescents perceive their parents' and peers' behavior quite accurately.

When investigating the influence from the socializers, environmental communication researchers choose one of two approaches. Some rely on young people's perceptions of the frequency of discussions about environmental issues (e.g., Valdez et al., 2018); others use parents' and friends' self-reported communication behavior (e.g., Matthies, Selge, & Klöckner, 2012). Yet, no study so far has compared differences in how adolescents and the key socializers perceive the frequency and content of communication about environmental issues. This aspect is, however, crucial for understanding influence and to what extent one can be influenced. The frequency of the adolescents' interactions with parents and the close nature of their relationships make the parent–child dyad the most suitable interaction context for comparing how communicative influence is perceived by both parties involved in an act of communication. I explored the accuracy of the perceptions with the third research question:

RQ3: How similar are the adolescents' perceptions of their parents' communicative influence and their parents' self-reported intentions with regard to influencing their adolescent children?

Before proceeding to the comparison, in the next part I empirically test whether adolescents with various communicative influences engage with environmental issues differently and if the communicative influence increases the probability of their future engagement.

Patterns of Communicative Influence and Proenvironmental Engagement

Data Collection and Participants

This study employed two waves of data from a longitudinal research program on young people's political development conducted in a city in central Sweden between 2010 and 2015. The adolescents were sampled from 10 schools in a range of neighborhoods, which allowed for including young people from different social and ethnic backgrounds, as well as from both college preparatory and vocational study programs. The questionnaires were filled out during regular school hours under the supervision of trained research assistants. The city is representative of the national averages for population density,

unemployment rate, and income levels. However, the proportion of young people with immigrant backgrounds is slightly higher than the Swedish average (24% vs. the average 20%; Statistics Sweden, 2012). Most of the parents had a college/university education and favorable financial situation.

In this study, I used information from a cohort of 16-year-olds (M_{age} = 16.6 years, 51% girls). In the first wave, the target sample comprised 1,052 adolescents and their parents, of which 892 adolescents (85%) filled out the questionnaires at school and 584 parents (55%) responded to the mailed questionnaire. In total, there were 518 pairs (49%) in which both an adolescent and his or her parent took part. In the second wave, the target sample comprised 996 adolescents, of which 807 (81%) filled out the questionnaires. The second wave of parents' data was not used in this study.

Attrition Analysis

I tested whether the adolescents whose parents did not fill out the questionnaire differed from those whose parents did. I ran a logistic regression with the adolescents' proenvironmental values, behavior, efficacy, perceived communicative influence from parents, and perceptions of parents' proenvironmental values as independent variables. The result showed that no variable significantly predicted parents' nonparticipation. The two groups were not different from each other (Nagelkerke R^2 = .03), suggesting that the study was not based on biased data.

Given that the study employed two waves of data, I compared the adolescents who did not answer the questionnaire the second time with those who did. The results from the logistic regression with the same independent variables also showed that no variable predicted the adolescents' nonresponse at age 17, and the groups did not differ substantially (Nagelkerke R^2 = .02).

Measurements

Proenvironmental Engagement

In this study, proenvironmental engagement was measured with three indicators: proenvironmental behavior, proenvironmental values, and environmental efficacy. The measure of proenvironmental behavior consisted of eight statements that evaluated how often young people "help their parents to recycle," "buy environmentally friendly products," "bike or walk instead of being driven by car," "choose to take public transportation instead of being driven by car," "save water in the household," "think about not buying things that I do not really need," "turn off the light when leaving an empty room," and "turn off the TV and other home electronics by unplugging them rather than just pressing the stand-by button." The items were assessed on a 5-point scale, from 1 = *almost never* to 5 = *almost always* (α = .83). This measure was created based on a questionnaire used by Ojala (2010) and validated in other studies (Östman, 2014).

Proenvironmental values was an aggregate measure that included three items taken from the biospheric value scale created by de Groot and Steg (2008): "It is important for me to respect nature and be environmentally conscious," "It is important for me to stop pollution and waste of natural resources,"

and "It is important for me to protect the environment and protect nature," measured on a scale from 1 = *not at all important* to 5 = *very important*. Both adolescents and their parents were asked to evaluate these statements. The adolescents were asked to report on how important these proenvironmental values were for them (α = .91) and, in their opinion, for their parents (α = .93). Similarly, the parents evaluated how important these three statements were for them (α = .90) and, according to their perceptions, for their adolescents (α = .91).

Environmental efficacy was represented with four statements: "I believe that I myself can do something to slow down climate change," "I'm confident that I myself can do something to save the environment," "If we all pitch in we can solve many environmental problems," and "If we work together, we can do something about climate change," which were evaluated on a scale from 1 = *does not apply at all* to 5 = *applies perfectly* (α = .87). This measure was created within this research program, but was also used and validated in other studies (e.g., Ojala, 2013).

Parents' communicative influence was measured with the question "Do your parents try to get you to become more aware of environmental issues?" Answers were given on a scale from 1 = *never* to 5 = *almost always*. The same question measured friends' influence: "Do your friends try to get you to become more aware of environmental issues?" Teachers' input was measured with the statement "There are teachers at school who try to encourage students to become more aware of environmental issues," rated on a scale from 1 = *does not apply at all* to 4 = *applies very well*. The intended influence from parents, as reported by parents, was measured with the question "Do you try to get your son/daughter to become more aware of environmental issues?" This question used the same scale as the corresponding question posed to the adolescents.

Analytic Strategy

To gain a broader perspective on adolescents' social networks and the extent of their communicative influence, I first identified subgroups of adolescents with different sources of influence. To detect naturally occurring groups, I used a two-stage cluster procedure. In the first stage, I entered three adolescents' self-reports representing communicative influence from the three socializers into hierarchical cluster analysis using Ward's method. According to Bergman and Magnusson (1997), the explained error sum of squares for the chosen cluster solution should preferably exceed 67% of the total error sum of squares. With the information about the number of clusters from the first stage, the final subgroups were identified with *K*-means clustering in the second stage. The measures were standardized before cluster analysis.

To answer the first research question—how the adolescents with various communicative influences differ in their proenvironmental engagement—I used multivariate analysis of variance (MANOVA), which allowed me to compare how the identified clusters differed in proenvironmental behavior, values, and efficacy on average and to test whether these three aspects of proenvironmental engagement could be treated as a single broader concept of proenvironmental engagement.

To address the second question, whether the communicative influence from the key socializers increased the probability of proenvironmental engagement one year later, I ran multiple regression analyses with future environmental characteristics as dependent variables. To use the subgroups with various patterns of communicative influence, I transformed the subgroups into dummy variables using indicator coding with "no influence" as a reference group (Hair, Anderson, Babin, & Black, 2010). As girls have been found to be more concerned about the environment than boys (Lee, 2009; Sundström & McCright, 2014), I controlled for gender in all regression analyses.

Results

A hierarchical cluster analysis of communicative influence from parents, friends, and teachers produced a seven-cluster solution that explained 70% of the error sum of squares. In subsequent *K*-means cluster analysis, these seven clusters presented the following variations: one group with no influence, three groups with one source of strong influence, two groups with two sources (teachers and parents; teachers and friends), and one group with all three sources (see Table 1). Group 2, with strong influence only from teachers, was the biggest group, with 290 of 837 people in the sample. One in four people did not experience any influence at all (212 people). The clusters also showed that influence from parents and friends was less common, as only 20.3% of the adolescents in the sample experienced influence from parents (Clusters 3, 5, and 7) and 29.5% from friends (Clusters 4, 6, and 7). At the same time, 65% of the adolescents perceived that their teachers encouraged them (Clusters 2, 5, 6, and 7).

Table 1. Cluster Solutions After K-Means Cluster Analysis Using Adolescents' Perceptions of Their Parents', Friends', and Teachers' Influence.

	Cluster						
Influencer	No influence (1)	Only teachers (2)	Only parents (3)	Only friends (4)	Teachers & parents (5)	Teachers & friends (6)	All three (7)
Teachers	−1.14	0.58	−1.17	−1.19	0.68	0.53	0.90
Parents	−0.56	−0.38	1.51	0.25	1.53	−0.26	1.28
Friends	−0.66	−0.50	−0.34	1.32	−0.40	1.19	1.27
Persons (*n*)	212	290	22	59	66	106	82

To analyze whether adolescents with various patterns of communicative influence differed in their proenvironmental engagement, I conducted a one-way MANOVA. Three measures of proenvironmental engagement were assessed: proenvironmental values, proenvironmental behavior, and environmental efficacy. There was a statistically significant difference between the seven clusters on this combined dependent variable, $F(18, 2475) = 7.89$, $p < .001$, Pillai's trace = 0.16; partial $\eta^2 = 0.05$. Based on the MANOVA results, a new variable was created, representing proenvironmental engagement. A follow-up univariate analysis of variance (ANOVA) showed that the differences among the clusters were statistically significant for the three indicators of engagement and the new variable (see Table 2). To analyze whether the clusters differed significantly from each other, I carried out an Student–Newman–Keuls post hoc test. The analysis revealed that the adolescents with all three sources of influence had the highest scores on proenvironmental values and efficacy and in general were the most engaged. Parents

played a key role for adolescents' proenvironmental behavior (the subgroup with parents as the only source of influence showed the highest commitment to such practices). And in general, the groups with parents who actively encouraged proenvironmental behavior (Clusters 3, 5, and 7) turned out to have the most engaged adolescents. A different trend was found for efficacy: Those young people who experienced communicative influence from at least two socializers had the strongest sense that their contribution mattered.

Overall, the results showed that young people with active parents exhibited higher proenvironmental values and stronger commitment to proenvironmental practices than their peers with other sources of communicative influence. Yet, the most engaged adolescents were the ones who were surrounded by committed parents, friends, and teachers. This suggests that communicative influence from only one socializer might not be enough to incite young people to engage with environmental issues. It was especially telling in the case of environmental efficacy: The more socializers encouraged the adolescents to become more aware of the issue, the more the adolescents believed that their contribution mattered.

Table 2. Mean Values of Proenvironmental Engagement Characteristics for the Seven Clusters.

	Cluster								
Variable	No influence (1)	Only teachers (2)	Only parents (3)	Only friends (4)	Teachers & parents (5)	Teachers & friends (6)	All three (7)	*F*	η^2
Values	−0.30	−0.07	0.33	0.14	0.28	0.06	0.68	12.68*	0.08
Behavior	−0.45	−0.07	0.55	0.14	0.41	0.29	0.49	17.14*	0.11
Self-efficacy	−0.38	−0.04	0.09	−0.04	0.35	0.28	0.57	14.15*	0.09
Engagement	−0.45	−0.07	0.39	0.09	0.42	0.26	0.71	21.604*	0.13

*$p < .001$.

However, these findings are based on cross-sectional analysis and, therefore, no conclusions can be drawn about the power of communicative influence to change young people's behavior. To investigate whether the existing patterns of communicative influence increased the probability of adolescents' future engagement (RQ2), I conducted regression analyses with proenvironmental values, behavior, efficacy, and proenvironmental engagement at age 17 as dependent variables. The communicative influence clusters were recoded into dummy variables with the "no influence" subgroup as the reference category. The results showed that neither proenvironmental values nor proenvironmental behavior increased more among adolescents with various sources of communicative influence than they did among the group with no influence (see Table 3). No differences in changes in proenvironmental engagement in general between the clusters with and without communicative influence were significant. The measure of environmental efficacy represented the only exception. The clusters with two sources of influence increased their sense of environmental efficacy one year later in comparison with the no-influence group.

Table 3. Predicting Future Engagement Based on Belongingness to One of the Clusters.

Variable	Future behavior at age 17 *B* (*SE*)	Future values at age 17 *B* (*SE*)	Future self-efficacy at age 17 *B* (*SE*)	Future engagement at age 17 *B* (*SE*)
Gender	−0.15** (0.06)	−0.11 (0.05)	−0.15** (0.05)	−0.11** (0.04)
Variable at Time 1 (at the age 16)	0.63*** (0.03)	0.63*** (0.03)	0.57*** (0.03)	0.69*** (0.03)
Cluster 2 (teachers only)	−0.01 (0.07)	0.06 (0.06)	0.12 (0.07)	0.03 (0.05)
Cluster 3 (parents only)	0.17 (0.11)	0.12 (0.17)	0.30(0.19)	0.18 (0.14)
Cluster 4 (friends only)	−0.02 (0.20)	0.21 (0.11)	0.08 (0.12)	−0.04 (0.09)
Cluster 5 (teachers and parents)	0.04 (0.13)	−0.12 (0.11)	0.26* (0.12)	0.10 (0.08)
Cluster 6 (teachers and friends)	−0.06 (0.12)	0.15 (0.09)	0.18* (0.10)	0.02 (0.07)
Cluster 7 (three sources)	0.09 (0.10)	0.06 (0.10)	0.16 (0.11)	0.05 (0.08)
R^2	.50	.40	.42	.56

*p < .05. **p < .01. ***p < .001.

Overall, the findings showed that those adolescents who experienced communicative influence from all three socializers were the most engaged ones. However, this communicative influence did not seem to play a role in the future changes in their proenvironmental engagement. Moreover, the communicative influence was measured with adolescents' self-reports and reflected their side of the story. In the next section, I investigate how accurate their perceptions of communicative influence can be by comparing adolescents' and parents' self-reports.

Parents' and Adolescents' Perceptions of Communicative Influence

Several reasons motivated the choice of parent–adolescent communication (and not communication with friends or teachers) for testing the accuracy of perceptions. First, when hearing the question "Do your parents encourage you to . . .?" one knows precisely which people are being referred to. When the same question is asked about one's teachers and friends, one can think of a number of people who can be relevant to answering the question. Hence, to trace patterns of communicative influence with friends and teachers becomes methodologically difficult. Moreover, teachers shape their message to address a group of students at once and may have no control or means to follow up on how these messages are perceived. Second, the results of the empirical investigation in this study highlighted the important role of parents in adolescents' proenvironmental engagement, as the groups with parents' influence scored high on proenvironmental values and especially on proenvironmental behavior. This made it even more relevant to compare how accurate adolescents' perceptions of their parents' words were. I approached this issue in several steps.

First, using ANOVA, I compared adolescents' perceptions of parental encouragement with their parents' reports of the same. Then I compared the accuracy of the parents' and the adolescents' perceptions of each other's values by correlating parents' and adolescents' reports. Then I ran an exploratory factor analysis to examine whether the adolescents' and parents' values and their perceptions of each other's values formed a common dimension, or if two different perceptual worlds existed: that of the parents and that of their children.

The results of the ANOVA revealed two rather dissimilar pictures of reality (see Figure 1). In general, parents' reports did not differ much across the seven clusters of young people, $F(6,493)= 3.95$, $p = .00$, $\eta^2 = 0.04$; yet, the adolescents' interpretations showed more fluctuations, with particularly high scores for Clusters 3, 5, and 7, $F(6,830)= 173.42$, $p = .00$, $\eta^2 = 0.55$. Apparently, some adolescents saw a lot of influence when very little was intended (Clusters 3, 5, and 7).

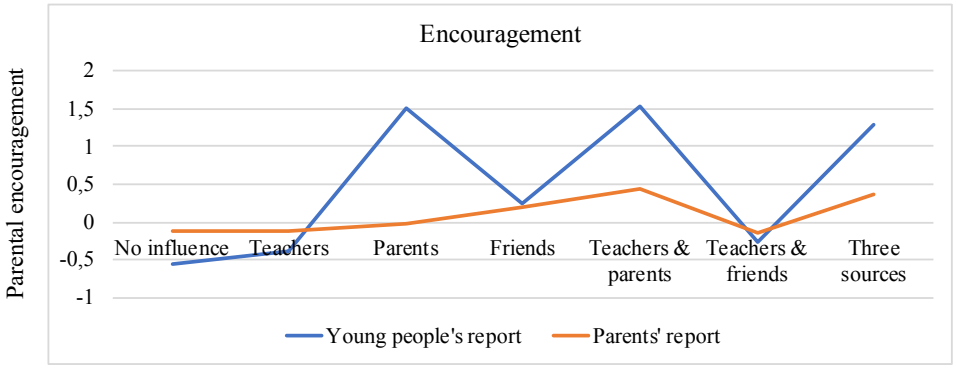

Figure 1. Comparison between adolescents' perceptions of their parents' encouragement and parents' self-reported communicative behavior; mean values for each of the seven clusters. The values are standardized.

For the total sample, there was low congruence between the adolescents' and their parents' proenvironmental values ($r = .17$, $p < .001$; see Figure 2). Moreover, the adolescents' perceptions of their parents' values showed equally low associations with their parents' proenvironmental values ($r = .15$, $p < .001$). By contrast, young people's perceptions of their parents' values were rather strongly associated with their own values ($r = .47$, $p < .001$). The differences between correlation coefficients were statistically significant ($z = –6.4$, $p < .001$). The same was true for parents: Their perceptions of their adolescent children's values were only moderately related to the adolescents' self-reported values ($r = .28$, $p < .001$), but were more strongly associated with their own values ($r = .46$, $p < .001$ [$z = –3.44$, $p < .001$]). These discrepancies suggest that both the adolescents and their parents seemed to have rather biased perceptions of each other's values. This bias could also explain how the adolescents perceived their parents' encouragement.

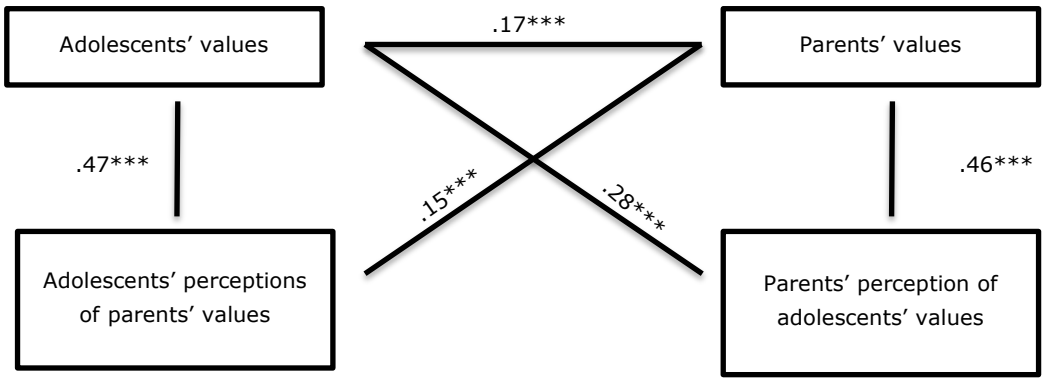

Figure 2. Comparison between adolescents' perceptions of their parents' encouragement and parents' self-reported communicative behavior; mean values for each of the seven clusters. The values are standardized.

To examine whether there actually were two perceptual worlds, I calculated an exploratory factor analysis using principal axis factoring with promax rotation method. I entered six variables—the four measures representing parents' and adolescents' proenvironmental values and perceptions of each other's proenvironmental values, parents' self-reported encouragement, and adolescents' perceptions of it (see Table 4).

Table 4. Factor Analysis of Parents' and Young People's Values, Perceptions of the Other's Values, and Parental Encouragement.

	Factors	
Variable	Parents' views	Adolescents' views
Parental values	.83	−.08
Adolescents' values as perceived by parents	.58	.02
Parental encouragement	.44	.16
Parental values as perceived by adolescents	−.04	.76
Adolescents' values	.10	.58
Parental encouragement as perceived by adolescents	−.01	.54

The factor analysis resulted in two factors with eigenvalues greater than 1.00. The factor pattern suggested that adolescents' perceptions of their parents' encouragement and of their parents' values were highly consistent with their own values. Hence, adolescents' experiences of communicative influence were guided by their existing proenvironmental values rather than by their parents' intentions.

It is noteworthy that the same held for the parents. They perceived that their adolescents' proenvironmental values were very similar to their own, which was not strongly reflected in the adolescents' views. The association between these two "perceptual worlds" was moderate (r = .34).

Discussion

The goal of this study was to explore the concept of communicative influence and to establish its role in adolescents' proenvironmental engagement. It contributes to the existing research on the topic with a longitudinal perspective and challenges the validity of commonly used measures of communicative influence.

The most engaged youth—those with strong proenvironmental values, sense of efficacy, and committed proenvironmental behavior—were those who reported communicative influence from all three socializers: parents, teachers, and friends. The engagement in the groups with fewer sources of influence was significantly lower. However, the number of influencers played a different role for various aspects of proenvironmental engagement.

Of all the indicators of proenvironmental engagement, efficacy differed the most among groups with different numbers of influencers. Only those who experienced encouragement from two or more sources, regardless of who those sources were, had a strong sense that their contribution mattered; they also strengthened their efficacy over a span of one year. These findings highlight the importance of social context for adolescents' proenvironmental engagement. A strong sense of efficacy cannot be imposed externally in the way that recycling can be a routine established by parents. In the context of environmental problems that require a collective action as a solution, a belief in one's own power to produce effect develops with the recognition that "although *I* as an individual have no way of overcoming the tragedy of the commons, *we*—the community as a whole—might together be able to do so" (Vogel, 2015, p. 213). Therefore, for adolescents to develop a sense of environmental efficacy, they need to be surrounded by people who share this belief. The more people around an adolescent who are committed to environmentally friendly practices, the more it feels like proenvironmentalism is a common culture. And when one experiences encouragement to become more environmentally aware from several people in one's close circle, one's small contribution, such as recycling or choosing a bike ride over being driven by car, becomes more meaningful as a contribution to existing "green culture," which in turn provides grounds to engage with environmentally friendly practices (Jugert et al., 2016).

Although the number of socializers who encouraged adolescents to be environmentally conscious seemed to make a difference, the biggest impact came from one socializer: the adolescent's parents. Among the young people who were encouraged by only one socializer, only those youngsters who reported influence from parents showed very high scores on proenvironmental values, behavior, and consequently, engagement in general. Contributions of teachers and friends, however, were only meaningful for those who were actively encouraged by more than one socializer. Previous studies have indeed pointed out the prominent role that parents play in proenvironmental engagement (Meeusen, 2014; Valdez et al., 2018). Moreover, Reid, Sutton, and Hunter (2010) suggest that the household is a crucible of proenvironmental behavior where societal values are transmitted to individuals. In this context, proenvironmental practices can be accepted not only because adolescents' behavior will have positive consequences for the environment and broader society, but also because it may be viewed positively by others in the family (Reid et al., 2010).

Although adolescents with different patterns of communicative influence from the key socializers did indeed have different environmental profiles, the longitudinal aspect of this study revealed a peculiar paradox. Belonging to a group with several sources of influence did not predict an increase in adolescents' proenvironmental behavior, nor did it strengthen their proenvironmental values one year later. In other words, the most engaged youth perceived that their parents, teachers, and friends encouraged them to become more environmentally friendly. Yet, this did not seem to be a driving force for the changes in their engagement.

One reason for this may be the insufficient precision of the measurement of environmental efficacy, which produced a "ceiling effect" in which a substantial number of respondents attained the highest scale value (e.g., Koedel & Betts, 2010). As this was the group that scored high on environmental efficacy at the first point in time, many adolescents might have reached the level above which variance in efficacy was no longer measurable. In other words, the adolescents chose the highest score at both points in time. Therefore, to capture the nuances of how the sense of environmental efficacy of highly engaged youth changes, other research methods may be more suitable.

The lack of significant changes in environmental engagement of the most engaged youth also indicates stability of their beliefs and practices. Stability in civic engagement is, however, not a passive developmental state; dynamic developmental processes underlie stability (Bornstein, Putnick, & Esposito, 2017). Wray-Lake and Shubert (2019) demonstrated that highly civically engaged youth do not automatically stay engaged; instead, civic discussions, along with other opportunities, are needed to sustain their level of engagement. Hence, communicative influence from the key socializers may help environmentally engaged youth to stay on course and to believe that their input matters.

How accurately adolescents perceive this influence is, however, a different question. The issue of bias in adolescents' and parents' reports was empirically addressed only by Collado, Staats, and Sancho (2017), who focused on perceptions of proenvironmental behavior and tested their hypotheses using adolescents' and their parents' reports. In this study, I focused on the perceptions of values and communicative influence of two parties. The systematic bias discovered in both adolescents' and parents' perceptions of each other's environmental views and influence is one of the main contributions of the study. The adolescents perceived their parents' proenvironmental values as being very similar to their own. They also interpreted their parents' intentions to influence them according to their own environmental views, which did not necessarily coincide with their parents' self-reports: Those who valued nature highly also reported that their parents influenced them, whereas those for whom protecting nature was not a top priority did not perceive that their parents tried to influence them. Hence, the findings suggest a more systematic bias concerning belief systems. One type of systematic bias, in which a person's perception of someone else's attributes is colored by his or her own attributes, is called *projection* (Schul & Vinokur, 2000). It is especially common among adolescents in their interactions with members of a close in-group such as family or peers (Clement & Krueger, 2002) and applies well when the values in question are not concrete or observable, as is the case with proenvironmental values (Stattin & Kim, 2018).

This biased perception of parental communicative influence suggests a different and important interpretation of the findings of the study. The group with encouraging parents valued nature and was

committed to proenvironmental behavior more than the groups with influence from other socializers. As the parents in this particular group reported giving very little encouragement, the adolescents are likely to have projected their own proenvironmental values onto their parents and interpreted their communicative behavior accordingly. On the one hand, these findings challenge the idea that parents' communication with the aim of persuading their kids to be more environmentally friendly is an effective tool. On the other hand, these results underline the importance of parents in adolescents' proenvironmental socialization. The fact that of the three groups with a single source of communicative influence, only the adolescents who perceived support from their parents were highly engaged, which shows that parents' input, even if not purposeful, resonated with the adolescents.

This allows us to consider that this cognitive mechanism may also be at work in other communicative contexts: with friends and teachers. Adolescents' existing beliefs may make them more prone to see the words of others as encouragement and to easily recognize them as such or to miss these cues entirely. And the fact that this cognitive mechanism was also observed in parents (they too believed that their children's values were very similar to their own) raises an important question: What do we actually measure with self-reports of other people's communicative influence?

Based on the findings of this study, it is safe to conclude that some adolescents interpret their parents' actions in line with their own beliefs, at least some of the time. What scholars as well as the general public want an answer to is this: If parents or other socializers start actively encouraging young people to be more environmentally friendly, will they achieve the desired outcome? The studies that use adolescents' reports about communicative influence may not be able to answer this question. Adolescents' accounts of their interactions may be influenced by their own environmental attitudes, by other aspects of their worldviews, and by their relationships with socializers, all of which affect how the adolescents perceive other people's words. Although perception is reality, it does not reflect how much of that encouragement was intended. This study has also shown that the parents also projected their own proenvironmental values onto their children. In addition to the observed perceptual bias, parents may be susceptible to the social-desirability bias. Their answers to the questionnaire may reflect how they wish they behaved rather than how they actually do. Although only a weak direct effect of social-desirability bias on environmental attitudes was found (Milfont, 2009), we cannot rule it out completely for all participants.

These limitations of commonly used measurements of influence call for a leap of imagination and a search for new ways to design studies to capture communicative influence with more nuance and by taking into account the cognitive mechanisms that may be at work. One way to do so could be to capture talk in action by maintaining a diary across interactions (e.g., Duck, Rutt, Hoy, & Strejc, 1991), which can offer longitudinal insights or comparisons of self-reports with observations (e.g., Qualter & Munn, 2005). A microanalysis approach that collects detailed information about the behavior, affect, and physiology of social interaction can also capture the moment-to-moment social interactions in everyday contexts (Warner, 2002). To make sense of the existing knowledge, it is important to demarcate the phenomenon more explicitly: Is it perceived or intended communicative influence? As studies are often reviewed without careful consideration of whose version of events is presented, communicative influence is falsely viewed as a homogeneous phenomenon that can be measured regardless of whose version is considered.

Although the ambition of this study was to provide a more holistic perspective on the role of socializers in adolescents' proenvironmental engagement, not all relevant sources of influence were possible to include. Apart from parents and teachers, other significant adults can be a source of encouragement and inspiration for adolescents. Important influence can also come from environmental content in different media.

Another limitation is that the adolescents reported on parental encouragement without differentiating between their mothers and fathers. The parent questionnaire was answered by one of the parents. Therefore, some of the discrepancies between children's and parents' accounts may be attributed to this incoherence. Further studies should therefore examine fathers' and mothers' communicative influence separately.

As the data were collected in 2010, it is important to mention that that was not an ordinary year. The general parliamentary elections in Sweden were held a few months after the data collection. This might have influenced the respondents' behavior and awareness about environmental issues. The descriptive statistics showed that one year later there was a general decrease in proenvironmental engagement. This may explain why no increase in future proenvironmental engagement was found for any of the groups.

Some phenomena are indeed difficult to capture, as people are "self-developing, proactive, self-regulating, and self-reflecting, not just reactive organisms shaped and shepherded by environmental events or inner forces" (Bandura, 2009, p. 94). And as the research community continues to look for sources of influence on concern for the environment, one should keep in mind that influence is just as much in the actions and words of the influencer as in the eye of the beholder.

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