



Consideration of future consequences and pro-environmental decision making in the context of persuasion and binding commitment

Christophe Demarque, Thémis Apostolidis, Robert-Vincent Joule

► To cite this version:

Christophe Demarque, Thémis Apostolidis, Robert-Vincent Joule. Consideration of future consequences and pro-environmental decision making in the context of persuasion and binding commitment. *Journal of Environmental Psychology*, Elsevier, 2013, 36, pp.214-220. <hal-00861354>

HAL Id: hal-00861354

<https://hal-univ-tlse2.archives-ouvertes.fr/hal-00861354>

Submitted on 12 Sep 2013

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Consideration of future consequences and pro-environmental decision making in
the context of persuasion and binding commitment

Christophe Demarque, Thémis Apostolidis, Robert-Vincent Joule

Aix-Marseille Univ, LPS EA849, 13621, Aix-en-Provence, France

*Manuscript accepted for publication in the Journal of Environmental Psychology
(authors' version)*

Corresponding author:

Christophe Demarque
Aix-Marseille Université,
Laboratoire de Psychologie Sociale
29 Avenue Robert Schuman
13621 Aix-en-Provence Cedex 1
France

christophe.demarque@gmail.com

demarque@univ-tlse2.fr

Highlights

- CFC was used to add new empirical evidence to the ABC model.
- We used three situations allowing variations of the weight of external conditions in decision making.
- We only observed an effect of CFC in the intermediate situation of persuasive communication.
- When a behavior is not/very favored by context, its dependence on CFC is weak.

Abstract

Based on the ABC model, which postulates that behavior (B) is a product of the interaction between attitudinal variables (A) and contextual factors (C), we studied the influence of social context on the effects of consideration of future consequences (CFC) within the framework of decision making about a pro-environmental behavior. The role of the external situation on the relationship between CFC and the studied behavior was observed through three types of situation: No-communication, persuasive communication and binding communication. The results showed a global effect of CFC on decision making with a moderating effect of the context: CFC had no effect in the least favoring condition (no-communication) nor in the most favoring condition (binding communication). We only observed an effect of CFC in the intermediate condition (persuasive communication). These results confirm the ABC model and highlight the value of taking account of the contextual factors in studying a psychological variable such as CFC.

Keywords: Consideration of future consequences; Future time perspective; Binding commitment; Persuasive communication; Pro-environmental behaviors.

1. Introduction

According to recent research, a future time orientation is associated with an increased incidence of pro-environmental behaviors (Milfont & Gouveia, 2006; Rabinovich, Morton, & Postmes, 2010). This could be explained by the fact that the uncertainties associated with environmental issues (the extent of climatic disturbance, the depletion of natural resources, demographic growth, etc.) necessarily involve expectations and projections into the future (Joireman, 2005). Indeed, behaviors affecting the environment have, for the most part, a deferred impact whose consequences are not felt until several decades later (Kollmus & Agyeman, 2002; Milfont, 2010).

1.1. Consideration of future consequences and the environment

Individuals differ in the way in which they foresee the consequences of their acts, some focusing on the long term consequences, while others do not see beyond the immediate consequences. Based on this observation, Strathman, Gleicher, Boninger and Edwards (1994) developed the concept of consideration of future consequences (CFC) and its associated measurement scale (Strathman et al., 1994). Individuals who obtained a high score on the CFC¹ scale (“high CFCs”) were more concerned about environmental problems, had pro-environmental attitudes, and stated that they either followed, or intended to follow to a greater extent, “eco-friendly” patterns of behavior (Ebreo & Vining, 2001; Joireman, Lasane, Bennett, Richards, & Solaimani, 2001; Joireman, Van Lange, & Van Vugt, 2004; Strathman et al., 1994). In addition, high CFCs tend to be more cooperative and to take the collective interest more into account in experimental dilemma situations where they have to manage fictitious natural resources (Joireman, Posey, Truelove, & Parks, 2009; Kortenkamp & Moore, 2006; Strathman et al., 1994).

¹ A high score indicates a strong tendency to focus on the future consequences of their acts in making behavioral choices rather than focusing on immediate consequences.

1.2. Studying the links between CFC and context: The ABC model

CFC is usually presented in these studies as a stable and trans-situational variable, generally seen as a moderator, either of the impact of some other factor within the individual (such as perceived environmental consequences; Joireman, et al., 2004) or of a feature of the situation that has been manipulated (such as the framing of environmental or health messages; Strathman et al., 1994; Orbell & Hagger, 2006). The relevance of CFC in the study of pro-environmental behaviors has been emphasized in the literature. However, relation to time and its influence on decision making is not only determined by relatively stable inter-individual differences, acquired via cultural and social factors, but also by characteristics of the context (Zimbardo & Boyd, 1999).

Currently, the idea of a dynamic interactive relation between people and their environment is widely spread in social psychology, notably in the study of pro-environmental behaviors. Indeed, it is well established that the weight of psychosocial factors in the setting up of pro-environmental behaviors varies in relation to the weight of contextual factors (Corraliza & Berenguer, 2000; Derksen & Gartrell, 1993; Steg & Vlek, 2009). In this context, the role of behavioral difficulty in moderating attitude-behavior relationships is still debated. According to Kaiser and Schultz (2009), two distinct sets of results can be identified: first, studies which highlight a strong link between attitude and behavior when situational constraints are low and when the behavior is relatively easy to carry out (Black, Stern, & Elworth, 1985). Second, studies which have demonstrated how attitudes strongly predicted difficult and costly behaviors (Schultz & Oskamp, 1996). An attempt to go beyond these two seemingly opposing sets of results has led to the development of a theoretical model suggesting that the attitude-behavior association is a curvilinear function of the strength of the external conditions (Guagnano, Stern, & Dietz, 1995; Stern, 2000).

The ABC model is a formalization of this latter idea, which postulates that behavior (B) is a product of the interaction between personal-sphere attitudinal variables (A) – including norms, beliefs and values – and contextual factors (C) (Guagnano et al., 1995). In this model, psychological variables will not predict behavior in contexts where action is either extremely difficult or extremely easy. For instance, in their study about curbside recycling, Guagnano et al. observed that the Schwartz norm-activation model did not predict recycling behavior for households equipped with plastic bins provided by the local authorities.

A comparison of 25 pro-environmental behaviors (from 5 studies based on survey data) partially validated the model (Kaiser & Schultz, 2009): a curvilinear relationship was found between behavioral difficulty and the strength of the attitude-behavior link (quadratic effect) which was no longer observed when “extreme” behaviors (with engagement proportion greater than 95% or smaller than 5%) were excluded from the analyses. Though we should be cautious when interpreting this latter result, as the authors have mentioned methodological issues that could explain their findings, other evidence in favor of the ABC model can be found in the literature. For instance, a before-and-after longitudinal study confirmed that the link between attitude and behavior was effectively influenced by the implementation of a waste collection system, as predicted by the model (Ölander & Thøgersen, 2006). More precisely, the modification of the attitude-behavior relationship depended on prior structural conditions. Indeed, attitude was a stronger determinant of source separation of compostable kitchen waste after the intervention in households with no gardens. In this situation, households experienced a transition from a very restrictive situation to a fairly restrictive one, as waste separation was made easier but not effortless. The change was smaller in households with a garden, where structural conditions were not that much improved.

In the current study we wanted to know if the ABC model could be extended to the consideration of future consequences, another psychological variable. Indeed, it seems relevant to study the influence of external conditions on the effects of CFC within the framework of decision making about pro-environmental behaviors. Using the same reasoning as for attitudinal variables, we tested whether external conditions could act as a potential moderator variable on the link between CFC and decision making, at least in some social situations. As emphasized by Guagnano et al. (1995), “external conditions are conceived of broadly to include all external sources of support or opposition to behavior, whether physical, financial, legal, or social” (p. 702). While most of the studies have focused on physical conditions, we suggest here enlarging “C” to social influence, as another way to investigate the situational strength.

1.3. Variation of external conditions: Persuasive vs. binding communication.

Psychological variables are hypothesized to predict behavior only in intermediate external conditions (Guagnano et al., 1995). In order to evaluate the moderating influence of social context and this specific hypothesis, we compared decision making in three contexts which varied the weight of external conditions. We focused on a particular kind of contextual force, interpersonal influence, representing different levels of facilitation. We chose two social communication situations, one involving persuasion and one involving a binding commitment, as well as a neutral situation without influence.

As a moderate facilitation of pro-environmental decision making, we used a standard persuasive communication situation. Persuasive communication situations are often used by governmental organisms and ecological associations. But, even if persuasive communication enables us to influence environmental attitudes (Bator & Cialdini, 2000; Staats, Wit, & Midden, 1996), there is still inconsistency between expressed attitudes and actual behavior, at least for costly behaviors (Diekmann & Preisendoerfer, 1992; Jensen, 2002).

To increase the level of facilitation, we used a binding commitment communication that differs from a persuasive communication by the inexpensive act that participants are requested to perform before they are exposed to a persuasive message (Joule, Girandola, & Bernard, 2007; Joule, Bernard, & Halimi-Falkowicz, 2008; Joule, Bernard, Geissler, Girandola, & Halimi-Falkowicz, 2010). In order to facilitate decision making, this commitment-based procedure, called binding communication, aims to bring together in the same research paradigm studies performed in the field of persuasive communication and those conducted in the paradigm of compliance in situations of free choice (Joule et al., 2007). If persuasion enables us to influence attitudes, compliance in situations of free choice, and notably the foot-in-the-door technique (Freedman & Fraser, 1966; Burger, 1999), enables us to obtain significant behavioral effects in the environmental domain (Lokhorst, Werner, Staats, van Dijk, & Gale, 2013). Moreover, in a recent meta-analysis based on 19 studies, Lokhorst et al. (2013) showed that commitment making was especially effective when it was combined with other interventions. In the case of binding communication, the exposition to a persuasive message is systematically preceded by a first inexpensive act. The act must be, according to consistency theories, consistent with the position defended in the message. For instance, if the message promotes waste separation, participants are requested to wear a badge that promotes waste separation just before they read the message. After that, the final request, which is more costly, is expressed. The originality of the binding commitment communication paradigm is to confer the status of “target” on the actor rather than that of a mere passive receiver (Joule et al., 2010). Much research, notably in the area of eco-citizenry, have demonstrated that binding communication is more effective than persuasive communication in eliciting changes in behaviors (Joule, et al., 2008, 2010). Through the manipulation of commitment factors, we assumed that pro-environmental decision making would be more strongly favored here than in a persuasive communication situation.

In the third situation, with no communication procedure, there is no facilitation of pro-environmental decision making.

The role of the CFC construct was studied in an experimental context of real decision making by individuals with regard to a specific pro-environmental activity that is rather difficult to secure: manning a stand. According to Stern (2000), this is a non-activist behavior in the public sphere. This category includes support behaviors for an event or an organization which can be distinguished from environmental activism by their occasional nature, as in the case of signing a petition. We have chosen to study a costly behavior characterized by great social visibility. We wanted to reduce intervention in decision making of factors not linked to environmentalism, as could have been the case with behaviors in the private sphere (economic reasons, personal comfort, etc.). Moreover, this kind of behavior is not much studied in the CFC literature, except in the works of Joireman et al. (2001) underlining the correlation between CFC and the signature of a petition in favor of more restrictive laws on the environment.

In summary, our main objective in this research was to evaluate the moderating role of the social situation on the effects of CFC within the framework of decision making concerning a non-activist pro-environmental behavior in the public sphere. We determined the influence of facilitation of pro-environmental decision making on the relationship between CFC and the studied behavior by comparing three types of social communication situations (no communication vs. persuasive communication vs. binding communication). In reference to the ABC model, if CFC plays a role in decision making facing a target request, is this role dependent on the social communication situation in which individuals are placed? And does CFC follow the same pattern as attitudinal variables?

2. Hypotheses

We expected, first, that high CFCs would agree to man the stand (Hypothesis 1a) and be willing to give up more time to it (Hypothesis 1b) than low CFCs. These hypotheses are based on the previously cited results and on works carried out in the public health domain (Orbell & Kyriakaki, 2008; Orbell, Perugini, & Rakow, 2004) highlighting the influence of CFC when dealing with persuasive messages. Second, we expected a linear effect of the communication situations. A greater number of participants should agree to man a pro-environmental stand, and be willing to give up more time to it, in the binding commitment communication situation than in the persuasive communication situation (Hypotheses 2a and 2b). We also expected that these two conditions, more or less favoring, would differ from a non-favoring situation where the request was made immediately without recourse to any prior communication device. Third, we expected an interaction effect between our two independent variables on our two dependent variables (Hypotheses 3a and 3b). In line with the ABC model, we expected that CFC would have a minimal influence in the two extreme conditions. In the no-facilitation condition, a costly request was expressed in a non-favoring situation. When a behavior is not favored by context, the more difficult or time-consuming it is and the weaker is its dependence on psychological variables (Stern, 2000). In the most favoring condition, the binding communication situation, we anticipated a predominance of contextual effects over the effect of CFC. Hence, the most important effect of CFC was expected in the persuasive communication situation (moderately favoring condition), which represented the intermediate condition in our study.

3. Method

3.1. Participants.

179 humanities undergraduate students from the faculty of arts of a French University took part in the research. The sample was made up of 102 women (Average age = 20.7; SD = 2.7)

and 77 men (Average age = 20.6; SD = 2.3), who were approached alone near the access of the central library.

3.2. Resources and procedure.

We approached the participants on the pretext of needing their opinion on a new environmental awareness brochure produced by *ADEME*² [French Agency for the Environment and Energy Control]. Once they had agreed, they were given the 7-items French version of the CFC scale (Demarque, Apostolidis, Chagnard, & Dany, 2010) adapted from the short version (Petrocelli, 2003), with items like “*Often I engage in a particular behavior in order to achieve outcomes that may not result for many years*” or “*I generally ignore warnings about possible future problems because I think the problems will be resolved before they reach crisis level*” (reversed item). Participants answered with scale from 1 (*Extremely uncharacteristic*) to 5 (*Extremely characteristic*).

3.2.1. Social communication conditions.

We employed two different types of communication in order to increase the probability that our target request would be accepted. The first of these was a persuasive communication situation (Hovland, Janis, & Kelley, 1953; Perloff, 2003), operationalizing a moderately favoring situation. In this situation, the participants read a brochure (persuasive message) describing the negative consequences of human activities for the environment, that emphasized the long-term benefits of environmental behaviors and which insisted on the need for us to change our habits ($n = 65$, persuasive communication condition). The second was a binding commitment communication situation (Joule et al., 2008; Joule et al., 2007), operationalizing a strongly favoring situation. In this case, participants ($n = 74$, binding

² *L'Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME)* is a French public organization one of whose missions is to create awareness among businesses and individuals of environmental protection and energy control issues.

commitment communication condition) received the same persuasive message, but after having carried out a pro-environmental low-cost act (preparatory act) consistent with the message, an initial act to which they all agreed. This consisted of a word association task (Eyssartier, Joule, & Guimelli, 2007) to create a new pro-environmental slogan for *ADEME*. Finally the final request was formulated: To man a stand for *ADEME* in the street during an upcoming event. The acceptance rate of this request constituted our first dependent variable. The participants who agreed had to indicate how much time (in hours) they were ready to give up to this activity, this duration constituting our second dependent variable.

3.2.2. No-communication condition.

In this condition without any communication device being employed, the final request was formulated just after the taking of the CFC test, before participants performed the preparatory act or read the brochure (non-favoring situation). In summary, this last condition and the binding communication condition constituted our extreme situations, while the persuasive communication was our intermediate situation.

4. Results

Table 1 presents a descriptive overview of our results, including a distinction between high and low CFCs, based on a median split. First, we observed that participants' CFC mean scores were homogeneous in the three conditions. Concerning our two dependent variables, our data confirmed our main effects hypotheses (no communication < persuasive communication < binding communication). Overall, 26 participants out of 179 (14.53 %) agreed to man the stand, with an average time of 0.46 hour ($SD = 1.47$).

As we used two distinct models of regression analysis (logistic and linear) to test our hypotheses, we decided to present the results for each dependent variable separately.

4.1. Dependent variable 1: Agreement to man the stand

We analyzed our data by carrying out a logistic regression analysis, according to the procedure suggested by Brauer (2002). As a first step, we centered CFC means. In order to test our second hypothesis, we compared two centered and orthogonal contrasts C1 (-1, 0, +1) and C2 (-1, +2, -1), following the recommendations of Brauer and McClelland (2005)³, where C1 corresponded to our linear hypothesis. We also tested our interaction hypothesis, using the product between CFC and the two previous contrasts C1 (-1, 0, +1) and C2 (-1, +2, -1) where C2 corresponded to our theoretical hypothesis (effect of CFC only in the intermediate situation). Table 2 presents the final step of the model, obtained through a forward Wald based stepwise procedure with IBM SPSS Statistics 19[©].

As a whole, the model was statistically significant ($\chi^2(1) = 24.50, p < .001$, Nagelkerke $R^2 = .23$). First, we observed a main effect of CFC ($\alpha = .74$) on agreement to man the stand. This result supported our hypothesis 1a. Second, we observed an effect of the communication context on agreement to man the stand. More precisely, congruently with the observed percentages (cf. Table 1), the results revealed that only contrast C1 was significant, whereas the contrast C2 was not (*Wald's* $\chi^2 = 0.40, B = - 0.10, p = .53$). This result confirmed the hypothesis of linearity (Hypothesis 2a). Third, we observed an interaction effect between our two variables, confirming our third hypothesis (Hypothesis 3a). The results revealed that only the interaction between CFC and contrast C2 was significant, whereas the interaction between CFC and contrast C1 was not (*Wald's* $\chi^2 = 1.15, B = 0.48, p = .28$). This interaction suggests that the social context moderated the effect of CFC on decision making. It appeared more clearly with a logistic regression analysis for each condition. As shown in Table 3, the effect of CFC is significant only in the intermediate situation of persuasive communication. Thus,

³ As the authors remind us, contrasts are centred and orthogonal if for each of the contrasts the sum of all values equals zero and if for each possible pair of contrasts, the sum of the products of the values for each condition is equal to zero (i.e. the contrasts are not correlated among themselves).

the effect of CFC on decision making was moderated by the more or less favoring nature of the situation in which participants were placed. The distinction between low and high CFCs facilitates the visualization of this result (cf. Table 1).

4.2. Dependent variable 2: Time allocated

We used a multiple linear regression analysis, including the same variables that were used for the other dependent variable (cf. Table 4). The overall model was significant but only explained a weak part of the variance ($F(2,176) = 8.31, p < .001, R^2 = .09$). We observed a main effect of CFC on time given up by participants to man the stand, confirming our hypothesis 1b. The linear contrast C1 was also significant, whereas the contrast C2 was not ($\beta = -.03, t(177) = -0.34, p = .73$). More specifically, the average time given up by participants in a persuasive communication situation differed from a binding commitment communication situation ($F(1,138) = 4.25, p < .05, \eta^2 = 0.03$), these two conditions also differing from the control condition (respectively $F(1,104) = 4.25, p < .05, \eta^2 = 0.03$ and $F(1,113) = 6.87, p < .01, \eta^2 = 0.06$). This set of results confirmed our hypothesis 2b. Nevertheless, neither the interactions between CFC with C1 nor with C2 were significant (respectively: $\beta = .07, t(177) = 0.92, p = .36$; $\beta = .06, t(177) = 0.76, p = .45$). The hypothesis 3b was not confirmed. In addition, in order to test the effect of CFC in each condition, we conducted three simple linear regressions. We observed the same pattern as for the first dependent variable, with an effect of CFC only in the persuasive condition (see Table 5).

5. Discussion

Our results globally revealed that the effect of the CFC variable was significant, whatever the dependent variable considered, whether it related to agreement to man a stand or to the time the participants wished to give up to it. These results contribute to those classically reported in

the literature about the links between future time extension, measured by the CFC scale, and pro-environmental behaviors.

Theoretical implications

It emerges from our results that a binding commitment communication context proves to be more effective overall than persuasive communication and no-communication contexts in leading participants to agree to a costly request and to give up some time to it. Although we only recorded intended behavior, we can presume here that the participants would be committed to this costly, public (the participants gave their name and email address), explicit and freely made decision (Joule & Beauvois, 1998). These results are also consistent with the previously cited observations (Joule, et al., 2008, 2010) and especially the efficacy of a combination of commitment with another treatment (Lokhorst et al., 2013). We propose here that the order of execution of the binding communication procedure is important. This is shown, for instance, by a study from Burn and Oskamp (1986). In order to increase the participants' support for a recycling program, these authors compared the efficacy of a classical persuasion procedure (persuasive message), a public commitment procedure (signature of a pledge card) and a combination of both. Their results showed that recycling behaviors in the three experimental conditions differed from a control condition but were not different within these conditions. We explain this result by the fact that, in the "combination" condition, the persuasive text was presented before the signature of the pledge card. However, we assume that the persuasive message will favor the rationalization of the inexpensive binding act only when it intervenes after this act. The persuasive message could thus reinforce the legitimacy of the performed behavior and, at the same time, favor the setting up of new consistent behaviors. Moreover, we suggest that the binding act should be performed before the diffusion of the message, making prominent the cognitions which are conform to the

message. In other words, the agreement to the message could be eased by the immediate availability of similar cognitions.

Concerning the interaction effect between our two independent variables, it seems that the effect of CFC on agreement to man the stand is moderated by the context, since this effect depends on the type of communication situations in which participants are placed. Main effects of CFC in each condition confirm this hypothesis. As far as we know, our study is the first to explore the moderating role of context in the relationship between CFC and decision making. Thus, this research also constitutes an experimental contribution to the debate about behavioral difficulty, going beyond the strict attitudinal sphere. We did not manipulate the behavior in itself, as it was the same across conditions. Nevertheless, as in Ölander and Thøgersen's study (2006), we observed how the degree of facilitation would modulate the influence of a psychological variable on decision making. Our data support the ABC model, showing a quadratic/curvilinear effect of the communication context. Indeed, a high score on the CFC scale is not sufficient in itself to induce pro-environmental decision making faced with a target request, expressed in a non-favoring situation (no communication condition). This discrepancy with other studies showing main effects of CFC on behavior in no communication conditions could be explained by the high cost of our target request. This is consistent with the idea that the more a behavior is costly (in time, money, effort), the less it is determined by psychological variables (Kollmus & Agyeman, 2002; Steg & Vlek, 2009). Hence, to observe a CFC effect, the participant should be placed beforehand in a specific situation of social communication.

However we observe an effect of CFC in the persuasive communication condition only, not in the binding communication condition. We suggest the difference stems from the fact that the persuasive communication situation requires a favorable individual predisposition to be efficient (i.e. a high level of CFC). This situation may make the individuals' cognitions

salient but may not influence directly behavioral choices, as it seems to be the case for binding commitment. In line with the ABC model, we do not observe this effect in the case of binding communication, in which the context prevails over CFC. This context of social communication is a strongly involving situation, characterized by a public, explicit and freely made decision. In this situation, we can assume that the structural conditions (C) are very influential, as they may induce a change in the self-concept (Burger, 1999).

In a nut shell, the effects of CFC are under the influence of social context. As predicted by the ABC model, we observe an inverted U-shaped function where the CFC-decision making link is weak when external conditions are extreme and is strongest when contextual influences are moderate. Even if these results are worthy of further experiments using other contextual influences (e.g. financial incentives) and other costly behaviors, they bring the first experimental evidence for the ABC model, while extending the model to another psychological variable, the consideration of future consequences. Taken together, these results follow the same pattern as attitudinal variables. They highlight in an innovative way, by manipulating experimentally situational strength, the value of taking into account the social communication situation in studying the links between a psychological variable such as CFC and pro-environmental behaviors.

Limitations

We observed a small size of some effects as well as a low percentage of agreement to our request, even under the most favorable conditions. This could be explained by the special nature of the studied behavior. Indeed, as an active kind of environmental citizenship (Stern, 2000), manning a stand is a costly public behavior, characterized by a strong social visibility (Stern, Dietz, Abel, Guagnano, & Kalof, 1999). We chose this behavior to avoid ceiling effects and maybe it was a bit too difficult, considering in addition that there was a period of approximately three weeks between the request and the so called event. But this low

behavioral variability allowed us anyway to confirm the ABC model. Another limitation lies in the fact the interaction effect is not significant for our second dependent variable, the time allocated to manning the stand. However, the main effects of CFC in each condition encourage us to further explore this dimension of behavioral commitment in future studies. Lastly, we measured behavioral intentions and not actual behavior.

Practical implications and perspectives

Our results open up perspectives in the domain of environmental communication. Indeed, the recognition of the consideration of future consequences of behavior could prove to be apposite in writing persuasive arguments and encouraging strategies for modifying behavior, with the development of a more contextual approach to the study of the links between CFC and pro-environmental behavior. As mentioned by Uzzell and Rathzell (2010), *“Although environment is at the heart of environmental psychology, the constituent “environment” of the term didn’t receive as much attention as its constituent “psychology”; consequently, there are numerous cases where the environment appears merely as a kind of mute background of human activity.”* (Uzzell & Rätzell, 2010, p. 248). Consequently, it will be necessary, in the future, to put a slant on the study of contextual variables, in the widest sense. For this, future research will have to give greater consideration to the parameters and dynamics of the social communicative situations in which individuals are placed, all the more so as psychological variables are generally not sufficient in themselves to explain environment-related behaviors. In this respect, we agree with Ölander and Thøgersen (2006) about the diagnostic value of the ABC model. When considering a desired behavior, once the structural conditions’ level of facilitation is evaluated, the model enables one to predict which intervention could be effective. In this perspective, this research not only points out the relevance of the binding commitment communication paradigm as an experimental operationalization of the social context (or of an involving social situation) but, particularly, it

confirms its value for easing decision making. Finally, it seems that future research will also have to emphasize the nature of the behaviors being considered (behavioral difficulty, cost, social visibility, etc.) in as much as, although grouped under the “pro-environmental behavior” label, they are not necessarily related to the same social processes and dynamics.

References

- Bator, R., & Cialdini, R. B. (2000). The application of persuasion theory to the development of effective proenvironmental public service announcements. *Journal of Social Issues, 56*(3), 527–541.
- Black, J. S., Stern, P. C., & Elworth, J. T. (1985). Personal and contextual influences on household energy adaptations. *Journal of Applied Psychology, 70*, 3–21.
- Brauer, M. (2002). L’analyse des variables indépendantes continues et catégorielles : une alternative à la dichotomisation [The analysis of continuous and categorical independent variables: Alternatives to dichotomization]. *L’Année Psychologique, 102*, 449–484.
- Brauer, M., & McClelland, G. (2005). L’utilisation des contrastes dans l’analyse des données : comment tester les hypothèses spécifiques dans la recherche en psychologie [The use of contrasts in data analysis: How to test specific hypotheses in psychological research]. *L’Année Psychologique, 105*, 273–305.
- Burger, J. M. (1999). The foot-in-the-door compliance procedure: A multiple-process analysis and review. *Personality and Social Psychology Review, 3*(4), 303–325.
- Burn, S.M., & Oskamp, S. (1986). Increasing community recycling with persuasive communication and public commitment. *Journal of Applied Social Psychology, 16*(1), 29–41.
- Corraliza, J. A., & Berenguer, J. (2000). Environmental values, beliefs, and actions. *Environment and Behavior, 32*(6), 832–848.
- Demarque, C., Apostolidis, T., Chagnard, A., & Dany, L. (2010). Adaptation et validation française de l’échelle de perspective temporelle « Consideration of future consequences » (CFC) [Adaptation and french validation of the future time perspective scale “Consideration of future consequences” (CFC)]. *Bulletin de Psychologie, 63*(5), 351–360.
- Derksen, L., & Gartrell, J. (1993). The social context of recycling. *American Sociological Review, 58*(3), 434–442.

- Diekmann, A., & Preisendoerfer, P. (1992). Persoennesliches Umweltverhalten: Die Diskrepanz zwischen Anspruch und Wirklichkeit. *Koelner Zeitschrift fuer Soziologie und Sozialpsychologie*, 44, 226–251.
- Ebreo, A., & Vining, J. (2001). How similar are recycling and waste reduction? Future orientation and reasons for reducing waste as predictors of self-reported behavior. *Environment and Behavior*, 33(3), 424–448.
- Eyssartier, C., Joule, R. V., & Guimelli, C. (2007). Effets comportementaux et cognitifs de l'engagement dans un acte préparatoire activant un élément central versus périphérique de la représentation du don d'organes [Behavioral and cognitive effects of commitment in a preparatory act activating a central versus peripheral element of the representation of organs donation]. *Psychologie Française*, 52, 499–517.
- Freedman, J. L., & Fraser, S. C. (1966). Compliance without pressure: The foot-in-the-door technique. *Journal of Personality and Social Psychology*, 4, 195–202.
- Guagnano, G. A., Stern, P. C., & Dietz, T. (1995). Influences on attitude-behavior relationships: A natural experiment with curbside recycling. *Environment and Behavior*, 27(5), 699–718.
- Hovland, C. I., Janis, I. L., & Kelley, H. H. (1953). *Communication and persuasion. Psychological studies of opinion change*. New Haven: Yale University Press.
- Jensen, B. B. (2002). Knowledge, action and pro-environmental behaviour. *Environmental Education Research*, 8(3), 325–334.
- Joireman, J. A. (2005). Environmental problems as social dilemmas: The temporal dimension. In A. Strathman, & J. Joireman (Eds.), *Understanding behavior in the context of time* (pp.289–304). Mahwah: Erlbaum.
- Joireman, J. A., Lasane, T. P., Bennett, J., Richards, D., & Solaimani, S. (2001). Integrating social value orientation and the consideration of future consequences within the extended norm activation model of proenvironmental behavior. *British Journal of Social Psychology*, 40, 133–155.
- Joireman, J. A., Posey, D. C., Truelove, H. B., & Parks, C. D. (2009). The environmentalist who cried drought: Reactions to repeated warnings about depleting resources under conditions of uncertainty. *Journal of Environmental Psychology*, 29, 181–192.
- Joireman, J. A., Van Lange, P. A. M., & Van Vugt, M. (2004). Who cares about the environmental impact of cars? Those with an eye toward the future. *Environment and Behavior*, 36(2), 187–206.
- Joule, R. V., & Beauvois, J. L. (1998). *La soumission librement consentie* [Compliance under Free Will]. Paris: Presses Universitaires de France.
- Joule, R. V., Bernard, F., Geissler, A., Girandola, F. & Halimi-Falkowicz, S. (2010). Binding communication at the service of organ donations. *International Review of Social Psychology*, 23(3), 199–226.

- Joule, R. V., Bernard, F. & Halimi-Falkowicz, S. (2008). Promoting ecocitizenship: In favor of binding communication. *International Scientific Journal for Alternative Energy and Ecology*, 6, 214–218.
- Joule, R. V., Girandola, F., & Bernard, F. (2007). How can people be induced to willingly change their behavior? The path from persuasive communication to binding communication. *Social & Personality Psychology Compass*, 1, 493–505.
- Kaiser, F. G., & Schultz, P. W. (2009). The attitude-behavior relationship: A test of three models of the moderating role of behavioral difficulty. *Journal of Applied Social Psychology*, 39, 186–207.
- Kollmus, A., & Agyeman, J. (2002). Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, 8(3), 239–260.
- Kortenkamp, K. V., & Moore, C. F. (2006). Time, uncertainty, and individual differences in decisions to cooperate in resource dilemmas. *Personality and Social Psychology Bulletin*, 32, 603–615.
- Lokhorst, A. M., Werner, C., Staats, H., van Dijk, E., & Gale, J. L. (2013). Commitment and behavior change: A meta-analysis and critical review of commitment-making strategies in environmental research. *Environment and Behavior*, 45, 3–34.
- Milfont, T. M. (2010). Global warming, climate change and human psychology. In V. Corral-Verdugo, C. H. García-Cadena, & M. Frías-Arment (Eds.), *Psychological approaches to sustainability: Current trends in theory, research and practice* (pp. 19-42). New York: Nova Science Publishers.
- Milfont, T. L., & Gouveia, V. V. (2006). Time perspective and values: An exploratory study to their relations to environmental attitudes. *Journal of Environmental Psychology*, 26, 72–82.
- Ölander, F., & Thøgersen, J. (2006). The A-B-C of recycling. *European Advances in Consumer Research*, 7, 297–302.
- Orbell, S., & Hagger, M. (2006). Temporal framing and the decision to take part in type 2 diabetes screening: Effects on individual differences in consideration of future consequences on persuasion. *Health Psychology*, 25(4), 537–548.
- Orbell, S., & Kyriakaki, M. (2008). Temporal framing and persuasion to adopt preventive health behavior: Moderating effects of individual differences in consideration of future consequences on sunscreen use. *Health Psychology*, 27(6), 770–779.
- Orbell, S., Perugini, M., & Rakow, T. (2004). Individual differences in sensitivity to health communications: Consideration of future consequences. *Health Psychology*, 23(4), 388–396.
- Perloff, R. M. (2003). *The dynamics of persuasion*. Lawrence Erlbaum Associates, Mahwah.
- Petrocelli, J. V. (2003). Factor validation of the consideration of future consequences scale: Evidence for a short version. *The Journal of Social Psychology*, 143, 405–413.

Rabinovich, A., Morton, T., & Postmes, T. (2010). Time perspective and attitude-behaviour consistency in future-oriented behaviours. *British Journal of Social Psychology, 49*, 69–89.

Schultz, P. W., & Oskamp, S. (1996). Effort as a moderator of the attitude-behavior relationship: General environmental concern and recycling. *Social Psychology Quarterly, 59*, 375–383.

Staats, H., Wit, A. P., & Midden, C. Y. H. (1996). Communicating the greenhouse effect to the public. Evaluation of a mass media campaign from a social dilemma perspective. *Journal of Environmental Management, 45*, 189–203.

Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. *Journal of Environmental Psychology, 29*, 309–317.

Stern, P. C. (2000). Toward a coherent theory of environmentally significant behaviour. *Journal of Social Issues, 56*(3), 407–424.

Stern, P. C., Dietz, T., Abel, T., Guagnano, G. A., & Kalof, L. (1999). A value-belief-norm theory of support for social movements: The case of environmentalism. *Human Ecology Review, 6*(2), 81–97.

Strathman, A., Gleicher, F., Boninger, D. S., & Scott Edwards, C. (1994). The consideration of future consequences: Weighing immediate and distant outcomes of behavior. *Journal of Personality and Social Psychology, 66*(4), 742–752.

Uzzell, D., & Räthzel, N. (2010). La contextualisation de la psychologie environnementale : une nécessaire évolution [The contextualization of environmental psychology: A necessary evolution]. In K. Weiss, & F. Girandola (Eds.), *Psychologie et développement durable* [Psychology and sustainable development] (pp.247–277). Paris: In Press.

Zimbardo, P. G., & Boyd, J. N. (1999). Putting time in perspective: A valid, reliable individual-differences metric. *Journal of Personality and Social Psychology, 77*(6), 1271–1288.

Table 1

Descriptive overview of the results

	No communication		Persuasive communication		Binding communication	
Means (SD) for CFC	3.62 (.61)		3.52 (0.59)		3.72 (.62)	
Low/High CFC	3.17 (.44)	4.11 (.32)	3.14 (0.43)	4.05 (.33)	3.18 (.51)	4.14 (.31)
Percentage of agreement	0 % (0/40)		12.3 % (8/65)		24.3 % (18/74)	
Low/High CFC	0 % (0/20)	0 % (0/20)	5.3 % (2/38)	22.2 % (6/27)	19.4 % (6/31)	27.9 % (12/43)
Time allocated (SD)	-		.29 (.88)		.86 (2.06)	
Low/High CFC	-	-	.06 (.33)	.61 (1.26)	.61 (1.68)	1.03 (2.32)

Note. The number of participants is given in brackets and the length of time is expressed in hours.

Table 2

Logistic regression analysis for agreement to man the stand

	B	S.E	Wald	Df	Sig.
CFC	1.06	.42	6.24	1	.01
Communication situations (Contrast 1, linear hypothesis)	1.48	.47	9.88	1	.002
CFC*Communication situations (Contrast 2, curvilinear hypothesis)	.73	.32	5.04	1	.03

Table 3

Logistic regression analyses for agreement to man the stand for each condition (with CFC as an independent variable)

	B	S.E	Wald	df	Sig.
No communication	-	-	-	-	-
Persuasive communication	2.14	.85	6.31	1	.01

Binding communication	.37	.32	.63	1	.43
-----------------------	-----	-----	-----	---	-----

Note. As the dependent variable was constant in the no-communication condition, the statistics couldn't be calculated.

Table 4

Regression coefficients for time allocated to manning the stand

	β	t	Sig.
CFC	.18	2.43	.02
Communication situations (Contrast 1, linear hypothesis)	.22	3.04	.001
CFC*Communication situations (Contrast 2, curvilinear hypothesis)	.06	.076	.45

Table 5

Simple regressions coefficients for time allocated to man the stand for each condition (with CFC as an independent variable)

	β	t	Sig.
No communication	-	-	-
Persuasive communication	.40	3.42	.001
Binding communication	.15	1.27	.21

Note. As the dependent variable was constant in the no-communication condition, the statistics couldn't be calculated.