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EIMECA: a proposal for a model of collective environmental actions

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Abstract

The deterioration and destruction of the environment is becoming more and more considerable and greater efforts are needed to stop it. To accomplish this feat, all members of society must identify with environmental problems, with collective environmental action being one of the most relevant means of doing so. From this perspective, the analysis of the psychosocial factors that lead to participation in environmental collective action emerges as a priority objective in the research agenda. Thus, the aim of this study is to examine the role of "environmental identity" as conceptualized by Clayton, as a central axis for explaining environmental collective action. The inclusion of the latter in the theoretical framework of the SIMCA model gives rise to the model that we have called EIMECA. Two studies were conducted, and the results reveal that environmental identity, a variety of negative affects, as well as group efficacy accompanied by hope for a simultaneous additive effect, are critical when it comes to predicting environmental collective action.

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Key words: environmental identity; environmental collective action; emotions; moral conviction; group efficacy beliefs.

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Introduction

Global warming, environmental pollution, forest destruction, soil degradation, water scarcity, or species extinction are, among many others, examples of the various problems that currently plague Mother Nature, and with her, humanity. Although there are many people who are not yet aware of this (or do not want to acknowledge it), it is also clear that there are many of us who can see that we are facing a great environmental crisis and it is clear that protecting the environment is necessary and fundamental for the existence and preservation of both our planet and the human beings that inhabit it.

The magnitude of the current problem is such that, in recent times, the defense of the environment is one of the reasons why citizens have become engaged in social mobilization. These actions have not been in vain, since the report published in 2018 by Mexico's National Institute of Statistics and Geography (INEGI), called "Statistics for World Environment Day (June 5)", states that collective actions in favor of the protection of the environment and natural resources are a reflection of the need for society to maintain a friendly relationship with the environment. Consequently, given the relationship established in the literature between human behavior and environmental crises, we are currently witnessing the emergence of a research agenda committed to analyzing the social factors that trigger this relationship (Brulle & Dunlap, 2015), with the factors that lead to collective action occupying a fundamental position.

The field of Psychology plays a crucial role in identifying and explaining the factors that facilitate people's involvement in collective actions. These are behaviors carried out in a group — either directly or as a representative of an organization — which seek to satisfy the shared and perceived interests of the members of that group, with the aim of provoking social transformation or change (Bamberg, Rees, & Seebauer, 2015;

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Marshall, 1998; Meinzen-Dick, DiGregorio, & McCarthy, 2004). Thus, this type of action differs from pro-environmental behavior in the private sphere or at the individual level, such as energy saving, use of public transport, household consumption, or recycling (Dono, Webb, & Richardson, 2010).

Although various psychosocial factors have been identified from social and environmental psychology for the prediction of environmental collective action, social identity has emerged as a key factor (Bamberg, Rees, & Seebauer, 2015; Carmona-Moya, Loureiro & Aguilar-Luzón, 2021; Fielding & Hornsey, 2016; Fritsche, Barth, Jugert, Masson, & Reese, 2018), occupying a central role in the various theoretical models that have been put forward in this regard in recent decades (Fritsche, Barth, Jugert, Masson, & Reese, 2018; Sabucedo, Dono, Grigoryev, Gómez-Román, & Alzate, 2019; Stürmer & Simon, 2004; Thomas, Mavor, & MCGarty, 2012; Van Zomeren, Postmes, & Spears, 2008; van Zomeren, Postmes, & Spears, 2012).

However, following a review of the literature, we concluded that there is still only a relatively small number of studies that address the relationship between social identity and environmental collective action, and there is also little integration of the factors involved in the proposed models. This research area therefore still lacks a unified theoretical framework (Bamberg, Rees, & Seebauer, 2015; Dono, Webb, & Richardson, 2010; Fielding & Hornsey, 2016; Fritsche, Barth, Jugert, Masson, & Reese, 2018; Schmitt, Mackay, Droogendyk, & Payne, 2019).

However, many of the models have been considered from a social psychology perspective, in the context of competitive collective action (Wright, 2009), that is, in the context of collective protest to reduce injustices and the structural disadvantages in society that are faced by low status or disadvantaged groups (Stürmer & Simon, 2004;

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Thomas, Mavor, & MCGarty, 2012; van Zomeren, Postmes, & Spears, 2008; van Zomeren, Postmes, & Spears, 2012). Theoretically, these models can be transferred to the field of collective action by conversion (Wright, 2009), which characterizes environmental collective action. Although there have been some attempts to provide evidence of the latter (Bamberg, Rees, & Seebauer, 2015), this remains a question that needs to be confirmed by much more research (Bamberg, Rees, & Seebauer, 2015; Fritsche, Barth, Jugert, Masson, & Reese, 2018).

In addition, the few existing studies in the literature have focused on studying the role of group identity and, above all, politicized identity (Bamberg, Rees, & Seebauer, 2015; Sabucedo, Dono, Grigoryev, Gómez-Román, & Alzate, 2019; Schmitt, Mackay, Droogendyk, & Payne, 2019). However, it is important to consider that within the domain of environmental behavior the construct "Environmental Identity" Clayton, 2003 has emerged, which has been shown in several studies to have a positive and significant correlation with environmental collective action behaviors (Alisat & Riemer, 2015; Carmona-Moya, Benítez, & Aguilar-Luzón, 2019; Carmona-Moya, Loureiro & Aguilar-Luzón, 2021). Consequently, we strongly believe that the analysis of the role of this conceptualization of environmental identity must be addressed and integrated into the analysis of collective action models in the specific context of environmental behavior.

In this paper, two studies are conducted in which we aim to address at least some of the limitations of previous studies, and also to contribute to the theoretical and empirical knowledge within the field of environmental collective action behavior. Our main objective was to test the role of environmental identity in predicting these behaviors. To achieve this objective, we will take as a theoretical frame of reference one of the most relevant models on collective action that has been successfully tested in the context of socio-structural injustices, that is, the SIMCA model (van Zomeren, Postmes, & Spears,

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2008; 2012). Likewise, we will take the conceptualization of the "environmental identity" of Clayton (2003), which is the most advanced concept and also the one that most closely resembles the concept of social-collective identity from all of those existing in the environmental field (Dono, Webb, & Richardson, 2010; Gosling & Williams, 2010; Tam, 2013). For this reason, we present the SIMCA model below, in order to later present the conceptualization of environmental identity from Clayton's perspective (2003).

Social Identity Model of Collective Action (SIMCA)

This model describes the background of collective action carried out by both disadvantaged (van Zomeren, Postmes, & Spears, 2008) groups, and by favored or advantaged (van Zomeren, Postmes, Spears, & Bettache, 2011) groups, to condemn situations of inequality and to promote social change. Although this model has been successfully tested in this context, with the exception of certain attempts (Bamberg, Rees, & Seebauer, 2015; Rees, Klug, & Bamberg, 2014), we have not been able to find further empirical evidence to conclude that the model works well within the context of environmental collective action. Furthermore, these studies have considered only group identity or politicized identity, rather than the broader construct of environmental identity.

Based on the previous literature, SIMCA proposes that group feelings based on anger or emotional experience of injustice over collective disadvantage, and the perception of group efficacy and group identity directly predict collective action. The main axis of SIMCA is identification with the disadvantaged group, considering that the motivations for changing social inequality require a strongly developed social identity (van Zomeren, Postmes, & Spears, 2008; 2012). Thus, individuals who identify more strongly with the group, as opposed to those who identify less, are more committed to the situation, goals or objectives and group interests and pay more attention to shared group

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norms concerning the actions required to achieve such goals. The authors distinguish between group identity and politicized identity. Politicized identity implies identification with a social movement or organization that takes responsibility for the interests of the group (Simon, & Klandermans, 2001). Therefore, the authors propose and confirm in their study (van Zomeren, Postmes, & Spears, 2012) that the politicized identity, but not non-politicized identity, allows for predicting the collective action, since the former is more normatively oriented than the latter towards such action, and the members of the group feel a stronger internal obligation to participate in the activities of an organization of the social movement (Ellemers, Spears, & Doosje, 2002; van Zomeren, Postmes, & Spears, 2008). Further, the model also assumes that politicized identification not only directly predicts collective action, but also indirectly, because it increases group feelings based on anger, while at the same time increasing the perception of group efficacy (Bandura, 2000; van Zomeren, Spears, Fischer, & Leach, 2004). However, the authors propose that moral convictions are at the root of politicized identification, the emotional experience of anger and injustice, and the sense of group efficacy (van Zomeren, Postmes, & Spears, 2012; van Zomeren, Postmes, Spears, & Bettache, 2011).

Taking the assumptions of this model as a reference framework, in this paper we integrate Clayton's conceptualization of "environmental identity" (2003) into this theoretical framework. This is regarded as the central axis for predicting environmental collective action. We have called the resulting model EIMECA (Environmental Identity Model of Environmental Collective Action). But before continuing to present the model, it is necessary to define even more precisely how environmental identity is going to be conceptualized in the present paper.

Conceptualization of environmental identity in the EIMECA Model

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The existing models that focus on social identity as a means of explaining collective action are based on the approach of the Social Identity Theory and the Self-categorization Theory (Reicher, Spears, & Haslam, 2010; Tajfel, 1978; Tajfel & Turner, 1979; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). According to this approach, social identity reflects a collective identity, i.e. the process by which people identify with a social category or a collective, such as a group, which leads the group to mobilize towards collective action. From that approach, as suggested above, we believe that the construct of "environmental identity" as conceptualized by Clayton (2003), deserves attention in order to predict environmental collective action. According to this author, nature can be conceived, just as social groups are conceived, as a community or collective, not exclusively human, but to which human beings belong. Therefore, it becomes possible to speak of a connection between nature (as a collective) and people, which affects the way they perceive it and which becomes an important part of their own self-concept. This connection with nature was defined by the author as "environmental identity" and based on this conceptualization, a scale was created with which to measure it based on theories about the factors that determine a "social-collective identity" (Luhtanen & Crocker, 1992; Sellers, Smith, Shelton, Rowley, & Chavous, 1998; Tajfel, 1981). The scale comprises multiple dimensions representative of the following factors: interaction with nature (the prominence of identity in the group), the importance of belonging to nature (the identification of oneself as a member of the group), the importance of nature (the agreement with an ideology associated with the group) and positive emotions towards nature (the positive emotions associated with the group).

In relation to this conceptualization and measurement of the environmental identity of Clayton (2003), the results of the Tam (2013) study allow the author to conclude that the constructs related to the connection with nature that are

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multidimensional, such as that of Clayton (2003), capture in good part the dimensions of relevant models of "social-collective identity" such as the Ashmore, Deaux, and McLaughlin-Volpe model (2004) and the Cameron model (2004). In general, the results of other studies provide empirical evidence for the ideas suggested by the author regarding the elements of the content underlying the environmental identity, as well as for the comments of other authors who have also suggested that this scale refers to ideas related to "social-collective identity (Dono, Webb, & Richardson, 2010; Gosling & Williams, 2010; Tam, 2013). For all these reasons, as indicated above, we believe that Clayton's conceptualization of environmental identity emerges as a conceptualization of social identity of interest for the explanation of collective action in the environmental context, and that it should be addressed in the theoretical framework of models in this regard.

EIMECA Model (Environmental Identity Model of Environmental Collective Action)

The EIMECA model is the result of integrating, within the theoretical framework of the SIMCA model, environmental identity as the central axis for predicting environmental collective action. It should be noted that we, unlike the SIMCA model, are not going to enter into a discussion of the distinction between politicized or non-politicized identity. Theoretically (Stürmer & Simon, 2004; Drury & Reicher, 1999; Drury & Reicher, 2000; Drury & Reicher, 2005; Reicher, 1996; Reicher, 2001; Simon, Loewy, Sturmer, Weber, Freytag, Habig, et al., 1998) both can predict collective action and there are studies, even in the field of environmental collective action (Bamberg, Rees, & Seebauer, 2015; Dono, Webb, & Richardson, 2010; Rees, Klug, & Bamberg, 2014; van Zomeren, Postmes, & Spears, 2008), in which the predictive capacity of the identity

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with the group or non-politicized identity is revealed. Our central interest is in the predictive capacity of environmental identity, as conceptualized by Clayton (2003).

To understand the links between environmental identity and the rest of the variables proposed by the SIMCA model, it must be taken into account, as presented above, that this is theoretically comparable with the conceptualization of the social-collective identity of the model (van Zomeren, Postmes, & Spears, 2008; 2012) since both share the same theoretical approach to the construction of social identity (Tajfel, 1978; Tajfel & Turner, 1979). From this perspective, and according to the assumptions of the SIMCA model, the relationships proposed in the EIMECA model should also be confirmed for the concept of environmental identity. Therefore, it is to be expected, at least theoretically, that the EIMECA model will fit well, that its predictive capacity will be adequate, and that environmental identity will prove to be the central axis of the model. In order to test the EIMECA model, two studies were carried out, which are described below.

Study 1

The aim of the first study was to test the EIMECA model with the main purpose of verifying the role of environmental identity in predicting environmental collective action behavior. Given that the assumptions proposed by the EIMECA model have already been set out above, we invite the reader to look at the theoretical framework of the model in Figure 1.

Hypothesis 1.1.- Moral convictions directly predict anger, group efficacy beliefs and environmental identity.

Hypothesis 1.2.- Environmental identity predicts anger and group efficacy beliefs.

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Hypothesis 1.3.- Anger, group efficiency beliefs and environmental identity directly predict environmental collective action behavior.

Hypothesis 1.4.- The effect of environmental identity on environmental collective action behavior is greater than that of the other variables in the model.

Insert Figure 1 here

Methods

Participants and Procedure

The sample was composed of a total of 344 participants, of which 27.6% were men, and 72.4% women. The participants were of Spanish nationality, with an average age of 24.59 years (SD=8.16). The data were collected after obtaining approval by the Ethics Committee of the University of Granada. All participants read the instructions for participation in the study and were assured that their answers would remain confidential. The participants were not required to provide any personal data that could identify them. Given the advantages of online data collection (Bachmann, Elfrink, & Vazzana, 1996; Garton, Haythornthwaite, & Wellman, 1997; Taylor & Maor, 2000; Wellman & Berkowitz, 1989; Yun & Trumbo, 2000), this method was chosen to distribute and complete the questionnaire. The questionnaire was created through the Limesurvey platform provided by the University of Granada, which was later disseminated through various social networks (Facebook, Twitter, WhatsApp and Instagram). We decided to use these media, since social networks present unique opportunities for rapid and cost-effective data collection from populations with very specific demographics or interests (Hütt, 2012). The responses were entered directly into spreadsheets that were then imported into statistical software (SPSS). In addition, AMOS vs.24 was used to assess hypothesized relationships, as well as the degree of model fit.

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Variables and Measuring Instruments

Moral convictions about environmental protection: We used six items from the study by van Zomeren, Postmes, Spears, and Bettache (2011) adapted to the environmental context. An example of an item is: "My opinion about environmental degradation is an important part of my moral norms and values". Participants were asked to respond to each item on a 5-point Likert-type scale from (1) indicating "Not at all" to (5), indicating "Strongly agree".

Anger: Defined as a negative feeling or emotion of rage or wrath (Miller, Cronin, Garcia, & Branscombe, 2009), this was measured using the following items, adapted to the environmental context of the study by Shepherd, Fasoli, Pereira, and Branscombe (2018): 1) "To what extent do you feel annoyed about the measures taken to alleviate the effects of environmental degradation? "2) "To what extent do you feel angry about the measures carried out to alleviate the effects of environmental deterioration" and 3) "To what extent do you feel indignant about the measures carried out to alleviate the effects of environmental deterioration". These are evaluated on a 5-point Likert-type scale (1=strongly disagree, 5=strongly agree).

Environmental Identity: This was measured using the Clayton's (2003) Environmental Identity Scale (EID) adapted to the Spanish context by Olivos and Aragonés (2011). This scale is composed of 24 items, with a 5-point Likert response scale (1: very much in disagreement; 5: very much in agreement) that evaluates four dimensions of environmental identity: "enjoying nature", "appreciation of nature", "environmental identity" and "environmentalism". Examples of the items are: "I think of myself as part of nature, not separate from it"; "I have a lot in common with environmentalists").

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Group Efficacy Beliefs: Participants were required to express their degree of agreement (1 "Not at all" to 5 "Strongly agree") with 4 items used in the study by van Zomeren, Postmes, and Spears (2012), which were adapted to environmental behavior. An example of an item is: "As inhabitants of this planet, I think we can successfully defend our natural resources together".

Environmental Collective Action: The Environmental Collective Action Scale (EAS) (Alisat & Riemer, 2015) adapted to the Spanish context by Carmona-Moya, Benítez, and Aguilar-Luzón (2019) was used. The question participants are required to think about when answering is: "In the last six months, how often have you participated in the following environmental activities or actions? These activities are evaluated through 16 items on a 5-point Likert-type response format, where (0) is "never" and (4) is "frequently". This scale provides a score both globally and for two distinct dimensions: leadership actions (LA) and participation actions (PA). An example of an item is: "Have you participated in a community event focused on raising environmental awareness (such as cleaning beaches, forests, etc.)".

Results

First, a descriptive analysis of the variables was carried out, whilst Cronbach's alpha value was calculated for each scale. The mean scores of all variables were relatively high (above the scale mean). Pearson's correlation analyses were then conducted (see Table 1). The results of these analyses revealed significant correlations between the different variables.

Insert table 1 here

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Predicting Environmental Collective Action: Structural Equation Modelling (Path Analysis)

In order to test the hypotheses of the EIMECA model, as well as its fit to the data, structural equation analyses (Path Analysis) were carried out using the AMOS vs.24 statistical package. Given the condition of multivariate normality presented by the variables of the study, the maximum likelihood estimate (George & Mailery, 2001) was used. Since in testing the model, AMOS suggested a slightly better fit with the inclusion of direct effects of moral convictions on behavior, the analyses were repeated, obtaining the following estimates for global collective action behavior: CMIN/DF = .569; CFI = 1.000; TLI = 1.013; RFI = .984; NFI = .998; SRMR = .0089; RMSEA = .000; and for global collective participation behavior: CMIN/DF = .569; CFI = 1.000; TLI = .1.012; RFI = .985; NFI = .998; SRMR = .0089; RMSEA = .000. For collective leadership action, AMOS did not suggest including any extra relationships to those already established in the model: CMIN/DF = .895; CFI = 1.000; TLI = 1.004; RFI = .969; NFI = .994; SRMR = .0148; RMSEA = .000. The estimates of the standardized coefficients found for the different model paths, together with their significance, are displayed in Figures 2, 3 and 4. The percentage variance in global collective action behavior explained by the model was 23.8%; for participation this was 30% and for leadership 9.7%. Environmental identity explained 31.1% of the variance in each of the three behaviors.

Insert figures 2, 3 and 4 here

Brief Discussion (Study 1)

The results of Study 1 confirmed Hypothesis 1.1. (Moral convictions directly predict anger, group efficacy beliefs, environmental identity) and Hypothesis 1.2. (Environmental identity predicts anger and group efficacy beliefs). With regard to

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Hypothesis 1.3., it was confirmed that environmental identity directly predicts the three behaviors, but the predictive capacity of anger was not confirmed and, although a significant relationship was obtained, the positive effects of group efficacy were also not confirmed, since they were negative. These latter results are in line with those reported in the study by Bamberg, Rees, and Seebauer (2015), since no relationship was found between the negative emotions of anger, indignation and rage, and environmental collective action intent, or between group efficacy beliefs and such behavioral intent.

With regard to the degree of fit of the model, the estimates of the different indicators were excellent (Barrett, 2007; Bentler, 2007; Byrne, 2001). In this aspect of the model's results, it should be borne in mind that a new path was included that represented a direct effect of moral convictions on behavior. This effect can be justified theoretically, particularly if we consider that moral convictions are experienced as strong and absolute positions that do not acknowledge exceptions to the higher order principle. Thus, the costs associated with not acting in a manner consistent with what is believed (Festinger, 1957; Higgins, 1987), and the need to reaffirm the moral stance, lead to the need to act, as these are placed at a higher level of importance than any of the various identities that one may have (van Zomeren, Postmes, & Spears, 2011). Thus, participation in collective actions represents behavior that is morally consistent with those moral convictions.

Further, the model explains a relatively moderate percentage of the variance of the three behaviors. This suggests that there must be other fundamental variables that explain these behaviors. Other studies have shown the importance of variables such as the personal norm (Stern, Dietz, Abel, Guagnano, & Kalof, 1999; Stern, 2000), group norms (Terry & Hogg, 1996; Terry, Hogg, & White, 1999); perceived behavioral control (Bamberg, Rees, & Seebauer, 2015), or moral obligation (Sabucedo, Dono, Grigoryev,

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Gómez-Román, & Alzate, 2019). Even though the model could lose parsimony, future research could include these variables in the model. However, it should be noted that environmental identity explained the highest percentage of this variance (31.1%), and in comparison with the remaining variables, it obtained the highest coefficient in its relationship with behaviors, becoming the main variable in the model and, consequently, confirming the central hypothesis of our study (Hypothesis 1.4).

Despite these encouraging results, the absence of a significant relationship between anger and behaviors is of concern, as is the significant but negative relationship between group efficacy beliefs and behaviors. There are several reasons for these results, including the conceptualization and operationalization of the two variables in the specific context of environmental collective action. Therefore, it is undoubtedly the case that these first results can be improved. For this reason, a second study was carried out.

Study 2

The objective of this study was to obtain full support for the relationships established in the EIMECA model, whilst overcoming some of the limitations of Study 1, by improving the conceptualization and operationalization of perceived group efficacy beliefs and negative effects derived from the perception of environmental deterioration and environmental problems. Although the expected effect of group efficacy beliefs on collective action is well documented in several studies (van Zomeren, Postmes, & Spears, 2008) there are also other works where this effect has not been found (Bamberg, Rees, & Seebauer, 2015). In view of this situation, it appears that there are studies that show that although people show interest in problems such as climate change and other environmental threats, they still show feelings of hopelessness, pessimism and helplessness, as well as inactivity (Bentley, Fien, & Neil, 2004; Connell, Fien, Lee, Sykes,

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& Yencken, 1999; Eckersley, 1999; Hicks, 1996; Hicks, 2001; Ojala, 2012). And pessimism appears to be particularly strong when it comes to environmental issues (Hicks & Bord, 2001). Therefore, it is possible to suggest that the negative relationship found in our first study is due to the effect that certain emotions, such as hopelessness, could have on that relationship. In support of this suggestion, Cohen-Chena and van Zomeren (2018) propose and confirm in their study that such beliefs of group efficacy only motivate collective action when hope is high, but not when hope is low. Therefore, the second study set out to test whether the interactive effects of group efficacy beliefs with the emotion of hope better predicts collective action when compared with group efficacy beliefs alone.

Further, in this second study we also took into account the suggestions of some authors regarding the negative affects derived from the perception of deterioration and environmental problems. In this sense, several authors have proposed that, unlike competitive collective action, collective action by conversion (Wright, 2009) — as is the case with environmental collective action — may require the intervention of other negative emotions that are more relevant than anger, such as guilt or shame, since anger is the result of the evaluation of the behavior of majority groups or those in power, while in environmental collective action negative emotions may also be the result of self-evaluation of behavior (Rees, Klug, & Bamberg, 2014; Böhm, 2003; Ferguson & Branscombe, 2010). On the other hand, Kollmuss and Agyeman (2002) argue that the greater the emotional involvement of people in evaluating the state of the environment, the greater the level of commitment to generate more pro-environmental actions. Therefore, we believe that measuring a wider range of negative emotions, rather than just anger, could improve the prediction of environmental collective action.

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In this second study the hypotheses tested were the same as those of Study 1. However, since in this second study the measure of group efficacy beliefs focused on interaction with hope, and anger was replaced by a wider range of negative affects, the replacement of group efficacy alone with this interaction, and anger with negative affects, must be considered in the hypotheses.

Method

Participants and Procedure

The sample in this study was composed of 720 participants, of whom 31.5% (n = 227) were men and 68.5% women (n = 493). The participants were of Spanish nationality, with an average age of 28.56 years (SD = 11.90). The procedure used for data collection was the same as that described for Study 1.

Variables and Measuring Instruments

Moral beliefs about environmental protection, perceived group efficacy, environmental identity and collective action behaviors were measured using the same scales as in Study 1.

The negative Affective States derived from the perception of environmental deterioration were evaluated by means of the 10 items of the PANAS (Watson, Clark, & Tellegen, 1988) Negative Affect Scale adapted to the Spanish context by López-Gómez, Hervás and Vázquez (2015). Responses to each emotional state were assessed on a 5-point Likert scale (1="slightly or not at all" to 5="very much"). The evaluation of each effect was adapted to the context of environmental deterioration, presenting the items, for example, as follows: "Thinking about the last month, how much GUILT have you felt

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about environmental degradation?". Another example is: "Thinking about the last month, how ASHAMED have you felt about environmental degradation?".

With respect to Hope, the same items from the Cohen-Chena and van Zomeren (2018) study were used, adapted to the context of environmental problems. These items were accompanied by a 5-point Likert response scale (1="strongly disagree" to 5="strongly agree"). An example of an item is: "I feel hopeful about the possibility of solving the problem of environmental degradation".

Results

First, various descriptive, scale reliability and Pearson correlation analyses were carried out, the results of which can be seen in Table 2.

Insert TABLE 2 here

The results revealed significant relationships between the different variables, with the exception of the relationship between group efficacy beliefs and hope, and with participation collective action behavior. It is worth noting that group efficacy beliefs was negatively and significantly correlated with leadership collective action behavior. It should also be noted that the mean scores of all the predictor variables were relatively high (at or above the mean of the scale), with the exception of hope, which is in line with the results of other studies (Bentley, Fien, & Neil, 2004; Connell, Fien, Lee, Sykes, & Yencken, 1999; Eckersley, 1999; Hicks, 1996; Hicks, 2001; Ojala, 2012) that also indicate a low degree of hope in relation to the resolution of environmental problems.

Predicting Environmental Collective Action: Structural Equation Modelling (Path Analysis)

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The EIMECA model in this second study was tested using the AMOS vs24 statistical package. Structural equation models were created (Path Analysis). Initially, the model was tested including the measure of group efficacy alone (without the moderating effect of hope). Given that in testing the model, AMOS suggested a slightly better fit with the inclusion of direct effects of moral convictions on behavior, the analyses were repeated, obtaining the following fit indicators for global collective action behavior: CMIN/DF = .427 / 1 = .427; CFI = 1.000; TLI = 1.07; RFI = .995; NFI = .999; SRMR = .0050; RMSEA = .000); and for participatory collective action: CMIN/DF = .427 / 1 = .427; CFI = 1.000; TLI = .1.006; RFI = .995; NFI = 1.000; SRMR = .0050; RMSEA = .000. For collective leadership action, AMOS did not suggest including any extra relationships to those already established in the model: CMIN/DF = 1.898; CFI = .998; TLI = .988; RFI = .974; NFI = .995; SRMR = .0139; RMSEA = .035.

The estimates of the standardized coefficients found for the various paths of the model, along with their significance, are displayed in Figures 5, 6 and 7. It should be noted that all were significant and positive, including the positive effect of negative affects on behaviors, but with the exception of the negative effect of group efficacy beliefs on behaviors. The percentage of variance explained by the model for global collective action behavior was 26%; for participation it was 30.8% and for leadership 14%. Environmental identity explained 31.1% of the variance in each of the three behaviors.

Insert figures 5, 6 and 7 here

Second, before testing the model for the effects of an interaction between group efficacy and hope, we verified whether these effects were indeed evident on the three collective action behaviors. Moderation analyses were conducted through the PROCESS package (Hayes, 2013), following the suggestions of its author. The Model 1 template

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was employed, controlling got Environmental identity and negative affects. The results revealed no significant interaction effects for global collective action (β = -.0297; *p* = .544), participatory collective action (β = -.0043; *p* = .933), and leadership collective action (β = -.0719; *p* = .176). Hierarchical block regression analyses revealed significant positive main effects of hope on global collective action behavior (β = .229; *p* = .000), participatory collective action behavior (β = .182; *p* = .000), and leadership collective action behavior (β = .280; *p* = .000). There were also significant negative main effects of group efficacy beliefs on global collective action behavior (β = -.148; *p* = .000), participatory collective action behavior (β = -.117; *p* = .000), and leadership collective action behavior (β = -.182; *p* = .000). The estimates of conditional effects offered in the analyses with PROCESS, as well as their graphical representation, suggested that as participation in collective action behaviors increased, the values of group efficacy beliefs and hope simultaneously increased. Since these results are inconsistent with the main effects obtained in the regression analyses, i.e. negative effects of group efficacy and positive effects of hope, this seems to indicate the possibility of joint rather than interactive additive effects. That is, only when group efficacy beliefs and hope are both high (or low) is there a positive effect (or not) on behaviors. Therefore, we proceeded to test such effects through the estimation of a new variable (which we called Hopeful Group Efficacy Belief) that combined this condition, that is, high scores on both variables and low scores on both variables. For this purpose, the construction of a continuous additive variable was chosen in preference to a categorical variable. The following formula was applied to obtain this variable: "Group Efficacy Score + Hope Score - | Group Efficacy Score - Hope Score |". This formula avoids the possibility that when adding up the scores, a low score on one variable is compensated with a high score on the other, and vice versa, matching high (low) scores on both variables. Hierarchical block regression analyses,

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controlling for negative affect and environmental identity, revealed significant effects of Hopeful Group Efficacy Belief on all three collective action behaviors (Global: β = .235; *p* = .000; Participation: β = .187; *p* = .000; Leadership: β = .286; *p* = .000).

The model for the three collective action behaviors was then tested and the new variable was included. Since AMOS suggested that the relationship between the new variable (Expected Group Efficacy) and negative affects could slightly improve the fit of the model, this was tested, obtaining the following model fit indices: global collective action behavior: CMIN/DF = 1.931 / 1 = .1.931; CFI = .999; TLI = .989; RFI = .978; NFI = .998; SRMR = .0091; RMSEA = .036; participatory collective action behavior: CMIN/DF = 4.737 / 1 = .4.737; CFI = .996; TLI = .959; RFI = .948; NFI = .995; SRMR = .0138; RMSEA = .072; Leadership Collective Action Behavior: CMIN/DF = .002 / 1 = .002; CFI = 1.000; TLI = 1.013; RFI = 1.000; NFI = 1.000; SRMR = .0003; RMSEA = .000.

The estimates of the standardized coefficients of each path, together with their significance for the model with the relationship of the new variable, Hopeful Group Efficacy Belief, and Negative Affects, can be observed in Figures 8, 9 and 10. The percentage variance in global collective action behavior explained by the model was 27.5%, that of participation was 31.2% and that of leadership was 17.7%. The percentage of explained variance of the Expected Group Efficacy Beliefs of each of the behaviors was 12.7%, and that of environmental identity was 31.5%.

Insert figures 8, 9 and 10 here

Brief Discussion (Study 2)

The objective of Study 2 was to obtain full support for the relationships established in the EIMECA model, overcoming some of the limitations of Study 1, by

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improving the measurement and/or operationalization of group efficacy and the negative effects derived from perceived deterioration and environmental problems. First, we explored whether the inclusion of the new measure of negative affect in the model, while still maintaining the measure of group efficacy belief alone, improved the relationship between negative affect and collective action behaviors. The estimates of the coefficients for each path were, on this occasion, all significant, including the relationship between negative affects and behaviors, although the relationship between group efficacy and these behaviors, as in Study 1, continued to be negative.

Therefore, the results replicated those obtained in Study 1 in terms of the positive relationships already found and added a positive and significant relationship between negative affects and behaviors (as opposed to the absence of a relationship found in Study 1, using anger alone). This shows that when explaining environmental collective action, consideration of the diversity of negative affects that can be derived from the perception and concern about the deterioration of the environment and the problems that surround it, allows it to be better predicted than when using anger alone. The results therefore confirmed the expected effect of the negative effects on behavior set out in Hypothesis 1.3 of Study 2.

However, it should be noted that the relationship between group efficacy belief and collective action behaviors was, as in Study 1, negative. Thus, the greater the group efficacy belief, the less participation in these behaviors. Therefore, the positive relationship expected in Study 1 between group efficacy beliefs and behaviors was also not supported in the preliminary analyses of Study 2. However, since in Study 1 the expected effects of group efficacy belief were not obtained, in this second study our interest was focused on testing the effects of an interaction between group efficacy belief and hope. However, the results did not allow us to confirm these interactive effects and

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therefore did not support Hypothesis 1.3 of Study 2. Given that the complementary analyses carried out suggested that rather than an interactive effect, there could be an additive effect, a new variable was constructed which we called Hopeful Group Efficacy Beliefs, which brought together the requirements of a continuous additive variable in which the high (or low) scores in both variables were added. The results of the model with this new variable revealed coefficients between all positive and significant paths. Therefore, it appears that the new variable of Hopeful Group Efficacy Beliefs explains the environmental collective action behaviors. Thus, according to these results, the probability of people engaging in environmental collective action behaviors increases significantly if both variables, that is, group efficacy beliefs and hope, are high.

The model analyses all three behaviors, including this new variable, and its relationship with both behaviors and negative affects yielded excellent goodness-of-fit indices. The percentage of variance explained by the model for each behavior ranged from low (17.7% for leadership behavior) to medium (31.2% for participation behavior). Environmental identity again emerged as the central variable of the model, since it obtained the highest coefficients when predicting behavior, as well as being the variable that explained the most variance (31.5%).

In summary, the results of Study 2 appeared to provide further support for the relationships established in the EIMECA model, although in addition to an interactive effect between group efficacy and hope, it is necessary to think about an additive effect. Most importantly, the results show that Clayton's (2003) concept of environmental identity is able to successfully predict not only global collective action behaviors, but also distinct participation and leadership behaviors, the central feature of the model being its ability to predict, above all, environmental collective action behaviors both directly and

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indirectly, and explain a higher percentage of variance than the rest of the variables in the model.

General Discussion and Conclusions

The main objective of the studies in this paper was to test the role of environmental identity, as conceived by Clayton (2003), as a form of social - collective - identity when predicting environmental collective action, having framed the latter within the theoretical framework of the SIMCA (van Zomeren, Postmes, & Spears, 2008) model, which then gave rise to the model that we have called EIMECA. Therefore, of central interest was to confirm the predictive capacity of environmental identity, considering the relationships between the variables established in the model. To this end, two studies were conducted.

Study 1 confirmed the central role of environmental identity in predicting environmental collective action behavior (Hypothesis 1.4.), thus adequately addressing the main objective of our study. It was also confirmed that moral convictions directly predict anger, group efficacy, and environmental identity (Hypothesis 1.1.) and that environmental identity predicts anger and group efficacy (Hypothesis 1.2.). With regard to Hypothesis 1.3., it was only confirmed that environmental identity predicts behavior. Anger, as a measure of the negative affects derived from the perception of deterioration and environmental problems, failed to explain the behaviors of environmental collective action. Moreover, whilst group efficacy beliefs was able to explain such behaviors, this effect was in the opposite direction to that predicted by our hypothesis, that is, negative.

In Study 2, further support was sought for the relationships within the model by addressing the potential limitations of conceptualization and operationalization of group efficacy and the negative affects of Study 1. The results initially replicated those obtained in Study 1, including the central role of environmental identity, but also the negative

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effects of group efficacy on behavior. However, on this occasion, the absence of a relationship between negative affects (operationalized in Study 1 through anger) and behaviors did not emerge. In this second study, this relationship emerged as positive and significant by operationalizing negative affects with a measure that allows for the assessment of a greater diversity of these affects. In relation to the negative effects of group efficacy beliefs, we found no support for an interaction between these effects and hope. However, support was obtained for an additive and simultaneous effect of high (low) group efficacy beliefs and hope scores, that is, Hopeful Group Efficacy Belief in our study. Therefore, our study appears to highlight the important role of affects, not only negative, but also positive (hope) in explaining environmental collective action.

With regard to negative affects, it is evident that at least in the domain of environmental collective action, a wide range of negative emotions better predicts behavior than anger alone. This supports the idea that when trying to explain environmental collective action, one should not only consider the negative emotions (anger, indignation, rage) that derive from the evaluation of the behaviors of others, that is, of the majority groups or groups in power, but also those that derive from the self-evaluation of one's own behavior (e.g., guilt, shame) (Rees, Klug, & Bamberg, 2014; Böhm, 2003; Ferguson & Branscombe, 2010).

With respect to group efficacy, we did not gain support for Cohen-Chena and van Zomeren's (2018) idea that beliefs in group efficacy only motivate collective action when hope is high, but not when hope is low. However, the results revealed the important influence of high hope when group efficacy is high, that is, high group efficacy only has a positive effect on behaviors when it is also accompanied by high hope. Similarly, and no less important, it was found that these additive effects of hopeful group efficacy belief have a positive influence on the negative affects, exerting not only a direct effect on

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behavior, but also an indirect effect through the negative affects. For all these reasons, it can be inferred that hope, as a positive emotion, plays a fundamental role in the decision to actively participate in collective action behavior. Support for the additive effects obtained with respect to the Hopeful Group Efficacy Belief can be found in the results of other studies showing that positive affect builds psychological resources such as self-efficacy, and that it promotes the commitment of individuals to the environment (Fredrickson, 1998; Lyubomirsky, King, & Diener, 2005). In the same vein, Aspinwall (1998) concludes that positive affect influences people's assessments of the strength or adequacy of their resources for resisting negative events and information. Furthermore, the study by Coelho, Pereira, Cruz, Simões, & Barata (2017) reveals that positive affect is positively related to a person's perceived self-efficacy of their environmental performance, as well as their pro-environmental behavior. Moreover, in this last study, following the proposal of Aspinwall (1998), the authors suggest that these relationships reveal that people who have a high positive affect do not avoid negative information (e.g., deterioration, destruction) about the environment as a strategy to protect their feelings, but that these affects cause them to pay attention to such adverse information and to act on it by using psychological resources such as self-efficacy and adopting behaviors that protect the environment. This would therefore explain why the inclusion in our model of a positive and significant relationship between expected group efficacy and negative affects improved the fit of the model.

Further, it appears that our study supports the idea that environmental identity, as conceptualized by Clayton (2003), emerges as the central axis in the EIMECA model when predicting environmental collective action behaviors. Furthermore, this prediction was confirmed for both global collective action behavior and for the two distinct dimensions of participation and leadership. In this regard, we believe it is important to

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emphasize that this conceptualization is in line with the concept of social-collective identity that informs and underpins current studies on collective action from a psychosocial perspective. However, the conceptualization of environmental identity offered by Clayton is not a politicized identity, although it could form the basis for developing such an identity. This point is very significant, since our results on environmental identity do not support the proposal of van Zomeren, Postmes, Spears, and Bettache (2011) on the unique predictive capacity of politicized identity versus collective - group identity. This is notable, because following the studies by van Zomeren et al. (Van Zomeren, Postmes, & Spears, 2008; van Zomeren, Postmes, Spears, & Bettache, 2011), the few existing studies often tend to directly assess politicized environmental identity (Bamberg, Rees, & Seebauer, 2015; Dono, Webb, & Richardson, 2010; Sabucedo, Dono, Grigoryev, Gómez-Román, & Alzate, 2019; van Zomeren, Postmes, & Spears, 2012; Schmitt, Mackay, Droogendyk, & Payne, 2019), stating that group identification may not be sufficient to motivate participation in collective action. However, our results show that moral convictions can drive environmental collective action through their possible normative adjustment to the content of a collective identity - group or non-politicized, that is, environmental identity. Therefore, we believe that discarding the analysis of the relationship between non-politicized collective identity in the field of environmental collective action could be problematic. This is because we would be neglecting an alternative explanation of this behavior in those cases where there is no politicized organization associated with or representing the environmental interests of certain social groups that are still willing to participate in environmental collective action, motivated, for example, by their own identification with nature and the moral convictions related to such an identity. Thus, we understand that environmental collective action can often be a moral standard for people who are not inherently connected to politicized social -

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environmental - movements, something that can often occur in the domain of environmental collective action. For example, as some studies reveal, there are negative stereotypes about outgoing heads or leaders of environmental groups that hinder people from joining the politicized group (Bashir, Lockwood, Chasteen, Nadolny, & Noyes, 2013). Moreover, although environmental social groups share common interests, membership of politicized groups representing environmental interests could vary depending on the type of collective action they tend to take (e.g., violent-aggressive versus nonviolent-non-aggressive) (Fielding & Hornsey, 2016). In short, we think that if researchers insist on considering only politicized groups in the specific field of environmental behavior, this could lead to the assumption that participation of an individual in collective actions of a group are not considered as such if they decide to participate on their own (even if this is motivated by shared interests), because such actions do not adhere to or identify with a politicized environmental group.

In short, our testing of the model has revealed the need to adapt the conceptualization and operation of various constructs of the preliminary model when explaining environmental collective action, thereby giving rise to a new proposal through the EIMECA model. From our standpoint, we believe that these adaptations derive from the distinction that needs to be made between collective action behaviors in the field of social protest for the environment (collective action by conversion Wright, 2009) and collective action behaviors in the field of social protest against socio-structural injustices (competitive collective action Wright, 2009). Given the results of our study, the differences between these types of collective action lead us to conclude that the models to be tested are either specific to the environmental domain and already consider these differences or must be adapted to the specific field in which environmental collective action takes place.

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These important conclusions that can be drawn from the results highlight the relevance of the present study, which contributes to existing knowledge in the specific field of environmental collective action through the uniqueness of the EIMECA model compared with the SIMCA model. The EIMECA model therefore highlights the psychosocial factors that are important in predicting collective action behavior in the specific field of social protest for the environment. The EIMECA model, apart from assigning an important role to variables proposed by the SIMCA model, such as moral convictions and group efficacy, is singularly configured by granting a central role to environmental identity when it comes to explaining environmental collective action behavior, as opposed to the politicized identity proposed by SIMCA (without implying that a politicized environmental identity is not capable of predicting behavior). Likewise, the EIMECA model is characterized by assigning greater importance to the diversity of negative effects that can emerge in response to environmental deterioration and problems (and not only anger, rage or indignation). And finally, the EIMECA model is characterized by proposing an additive measure of group efficacy and positive emotions, such as hope. Without a strong feeling that change in environmental issues is possible, the belief that the group gathers the necessary resources to achieve change does not make participation in environmental collective action behaviors possible. Therefore, when explaining environmental collective action, according to the results obtained, emotions — both negative and positive in relation to the environment — play a fundamental role.

We do not want to finish this work without pointing out some potential limitations that could, to a certain extent, shape the conclusions that can be drawn from our findings. First, this is a correlational study, so it is not possible to make causal inferences regarding the direction of the relationships found. Second, it should be taken into account that our samples are composed of participants under 30 years of age and of Spanish nationality,

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most of whom are women. Therefore, it is necessary to replicate the study with more heterogeneous samples, at least in terms of age and gender, as well as from other countries and cultures. This would allow for greater generalization of the results found. It would also be interesting to test the model by considering the role that positive emotions can play in a wider range of emotions, in addition to hope.

Practical implications

This study not only makes a theoretical contribution, but our results also have practical implications that are of considerable interest, at least for environmental education professionals, environmental groups, political organizations of social movements in the environmental field, and even political leaders. As suggested above, research conducted so far on the role of social identity in environmental collective action has focused on the influence of politicized environmental identity on participation in environmental collective action. This identity supposes the adhesion to particular social groups which, due to the inter-group dimension of environmental problems, leads to a division of positions when faced with these problems and, consequently, to a confrontation and conflict with other social groups. This inter-group conflict, although unavoidable in the face of any social change, paralyzes the resolution of environmental problems (Fielding & Hornsey, 2016). One strategy for reducing inter-group conflict from a social identity perspective could be the creation of a higher order identity that includes conflicting subgroup identities and allows for the transformation of the group context from "us" to "them" to "us" (Gaertner, Dovidio, Anastasio, Bachman, & Rust, 1993; Gaertner & Dovidio, 2000; Opotow & Brook, 2003; Samuelson, Peterson, & Putnam, 2003). The environmental identity construct proposed by Clayton (2003), as opposed to a politicized environmental identity, has the advantage of being composed of various dimensions of the collective environmental identity, since, in addition to the

group environmental identity, it embraces, for example, identification with nature, an identity that may be common to many people regardless of their identification with many other social groups. The environmental identity of Clayton (2003) represents a good starting point for achieving this higher order identity and contributes towards progress in solving environmental problems. In this regard, a valuable line of future research could be to address the particular effects of each dimension of Clayton's concept of environmental identity on environmental collective action.

Further, it is important to remember that, in line with the results of other studies (Ojala, 2012), the present findings revealed rather pessimistic or hopeless feelings regarding environmental problems. Given that the results of this study also suggest the important role played by positive affects such as hope when participating in environmental collective actions, then the acquisition of such affects in the face of future environmental problems should be a fundamental aim when developing environmental education programs. The implicit message conveyed by the results of this study is that "together we can solve environmental problems" (group efficacy beliefs), "because change is possible" (hope).

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Figure 1. Theoretical framework of the EIMECA model

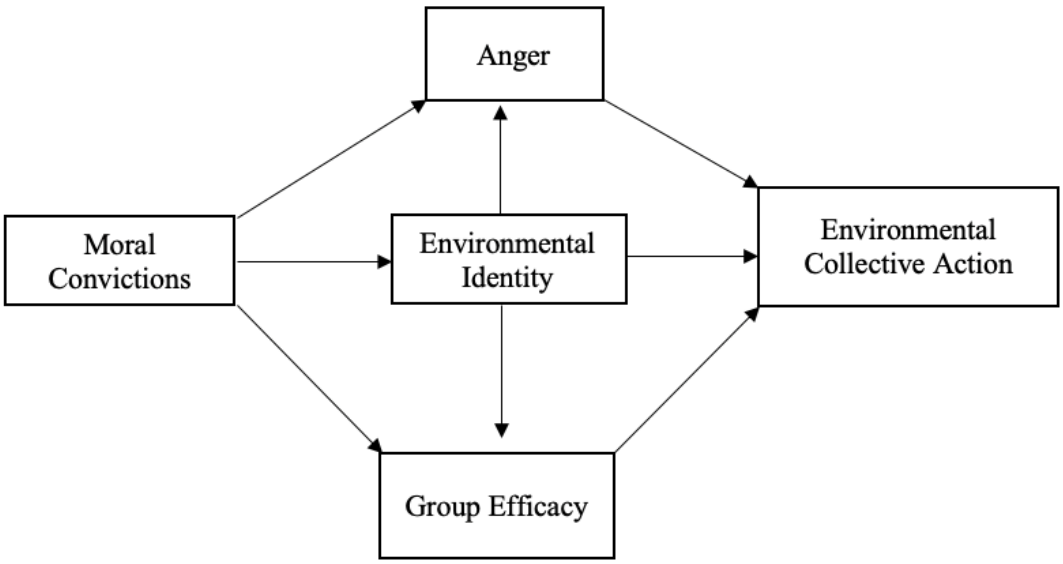

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Table 1. Descriptive and reliability analysis, and Correlations between key measures.

	M(SD)	Alfa Cronbach	1	2	3	4	5	6	7
1. MC	3.93(.90)	.87	-	.340**	.353**	.558**	.336**	.401**	.152**
2. ANGER	3.65(1.11)	.90		-	.198**	.340**	.206**	.239**	.106*
3. GEB	4.49(.71)	.90			-	.397**	.037	.103	-.095
4. EID	3.71 (.71)	.94				-	.441**	.509**	.231**
5. EAS_GL	2.03(.73)	.92					-	.969**	.881**
6. EAS_PA	2.34(.82)	.88						-	.736**
7. EAS_LA	1.50 (.71)	.82							-

MC = Moral Conviction; GEB = Group Efficacy Belief; EID = Environmental Identity; EAS_PA= Environmental Action Scale_ Participation Actions; EAS_LA = Environmental Action Scale_ Leadership Actions; EAS_GL = Environmental Action Scale Global.

*Correlation is significant at the 0.05 level; **Correlation is significant at the 0.01 level.

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Figure 2. Estimates of the standardized coefficients for the different EIMECA model paths: Global Collective Action.

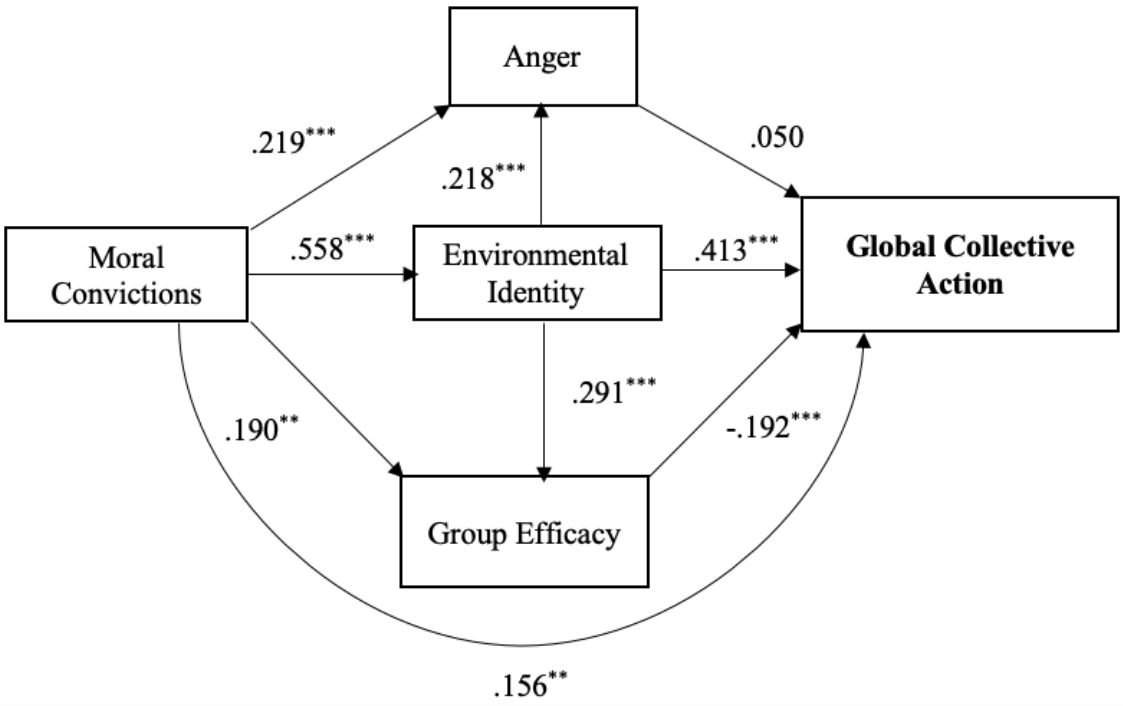

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Figure 3. Estimates of the standardized coefficients for the different EIMECA model paths: Collective Participation Action.

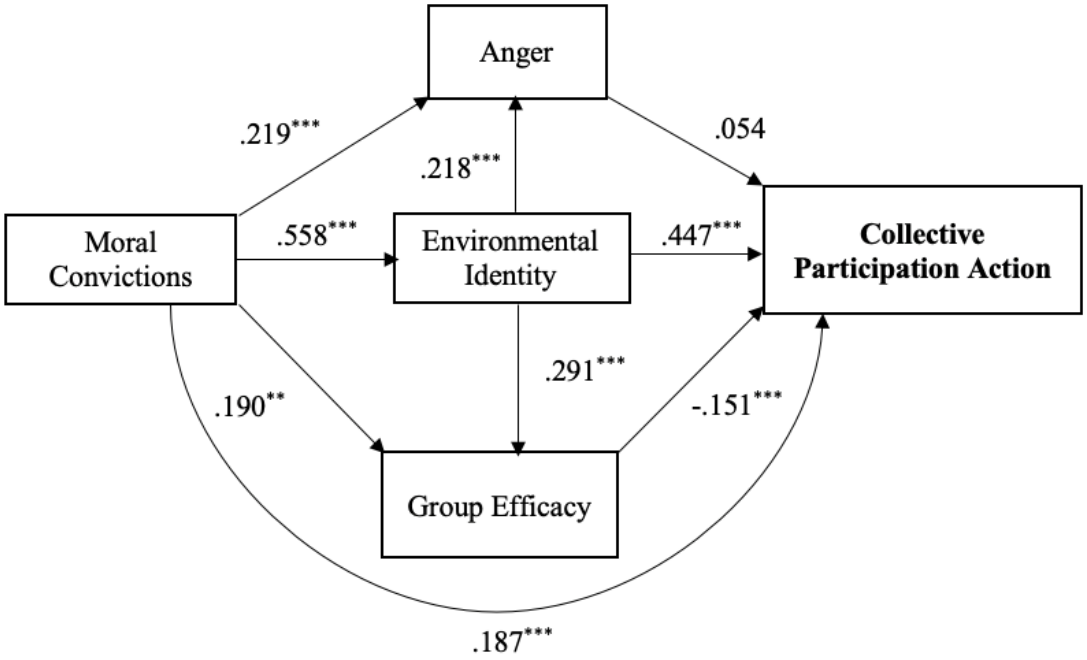

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Figure 4. Estimates of the standardized coefficients for the different EIMECA model paths: Collective Leadership Action.

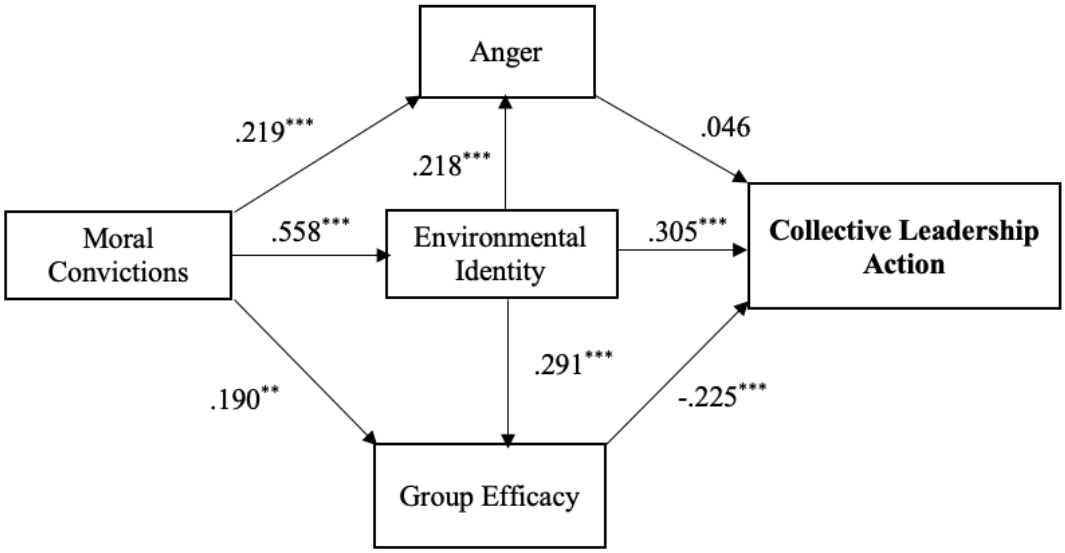

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Table 2. Descriptive and reliability analyses, and Correlations between the key measures of Study 2.

	M(SD)	Alpha Cronbach	1	2	3	4	5	6	7	8
1. MC	3.93(.85)	.87	-	.459**	.300**	.303**	.561**	.342**	.387**	.220**
2. NA	2.91(.92)	.91		-	.176**	.294**	.512**	.355**	.387**	.255**
3. GEB	4.55(.65)	.93			-	.040	.323**	.002	.050	-.082*
4. HOPE	2.28 (.94)	.85				-	.314**	.375**	.350**	.370**
5. EID	3.70 (.72)	.94					-	.455**	.510**	.302**
6. EAS_GL	1.72 (.95)	.91							.973**	.918**
7. EAS_PA	2.02(1.00)	.92							-	.803**
8. EAS_LA	1.21 (.97)	.87								-

MC = Moral Conviction; NA = Negative Affects; GEB= Group Efficacy Belief; EID = Environmental Identity; EAS_GL = Environmental Action Scale_Global; EAS_PA= Environmental Action Scale_ Participation Actions; EAS_LA = Environmental Action Scale_ Leadership Actions.

*Correlation is significant at the 0.05 level; **Correlation is significant at the 0.01 level.

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Figure 5. Estimates of the standardized coefficients found for the different relationship paths of the EIMECA model, including Negative Affects instead of Anger: Global Collective Action.

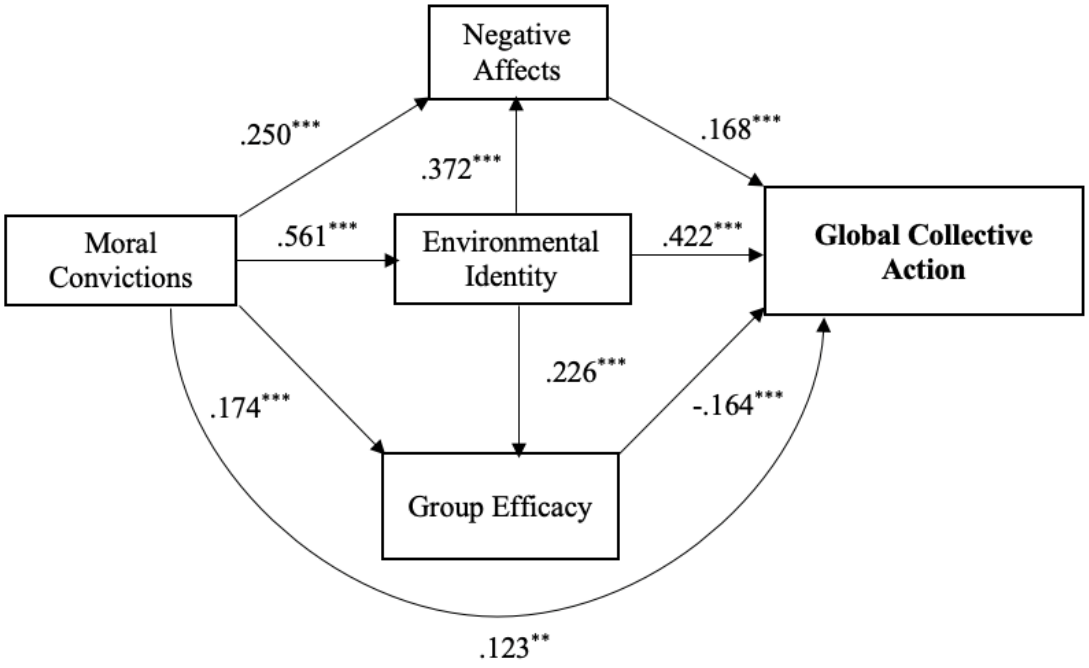

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Figure 6. Estimates of the standardized coefficients found for the different relationship paths of the EIMECA model, including Negative Affects instead of Anger: Collective Participation Action.

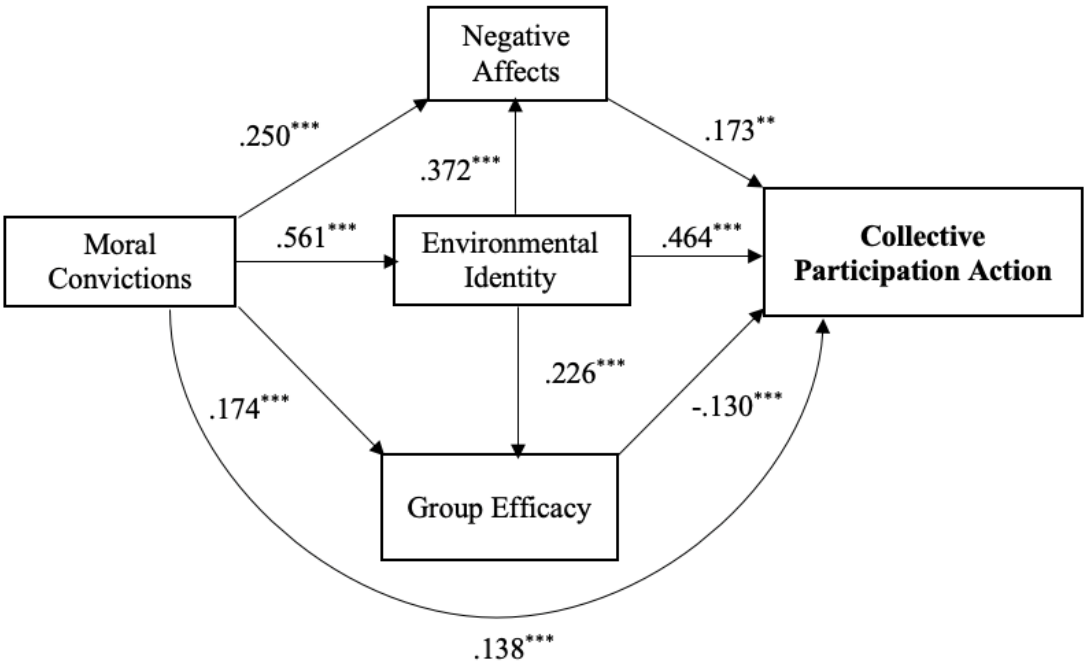

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Figure 7. Estimates of the standardized coefficients found for the different relationship paths of the EIMECA model, including Negative Affects instead of Anger: Collective Leadership Action.

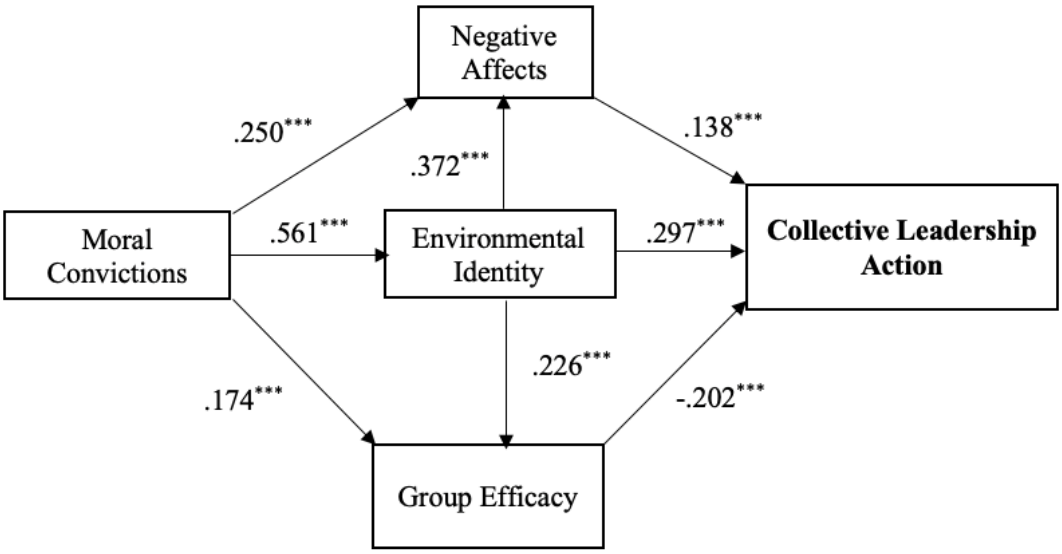

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Figure 8. Estimates of the standardized coefficients found for the different relationship paths of the EIMECA model, including Hopeful Group Efficacy instead of Group Efficacy Belief: Global Collective Action.

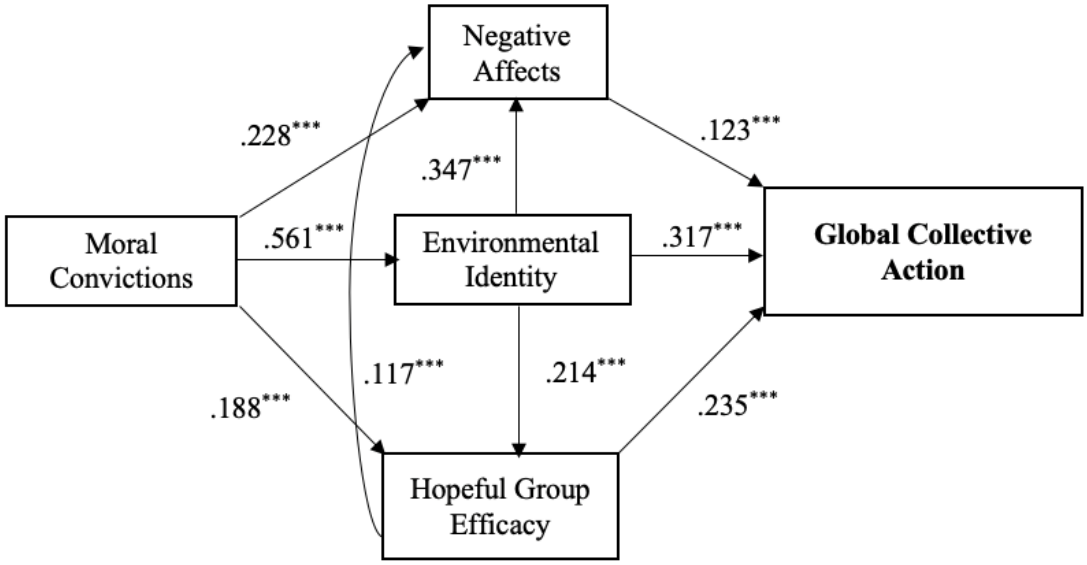

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Figure 9. Estimates of the standardized coefficients found for the different relationship paths of the EIMECA model, including Hopeful Group Efficacy instead of Group Efficacy: Collective Participation Action.

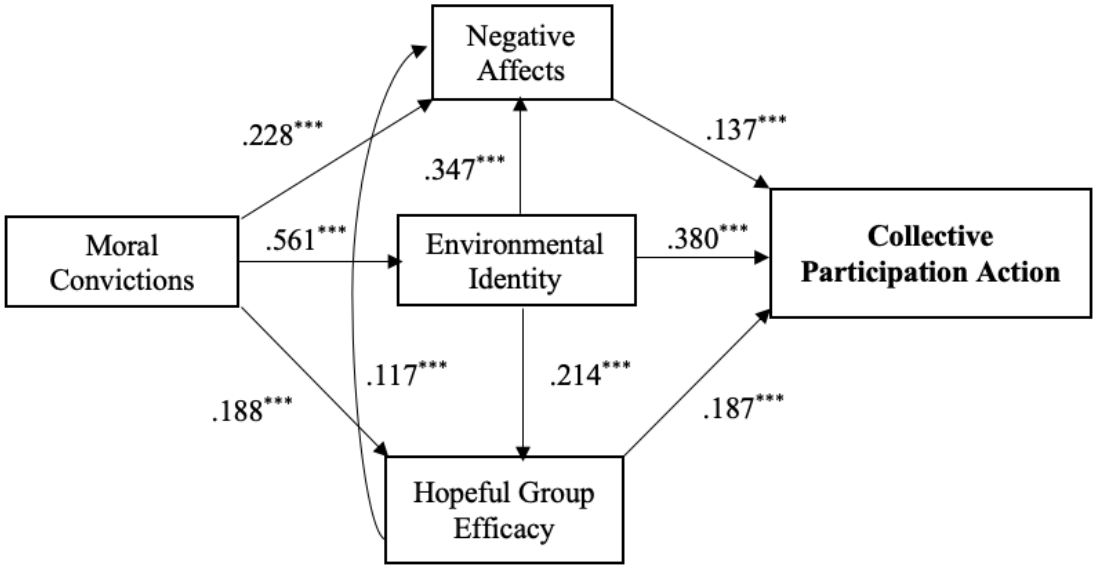
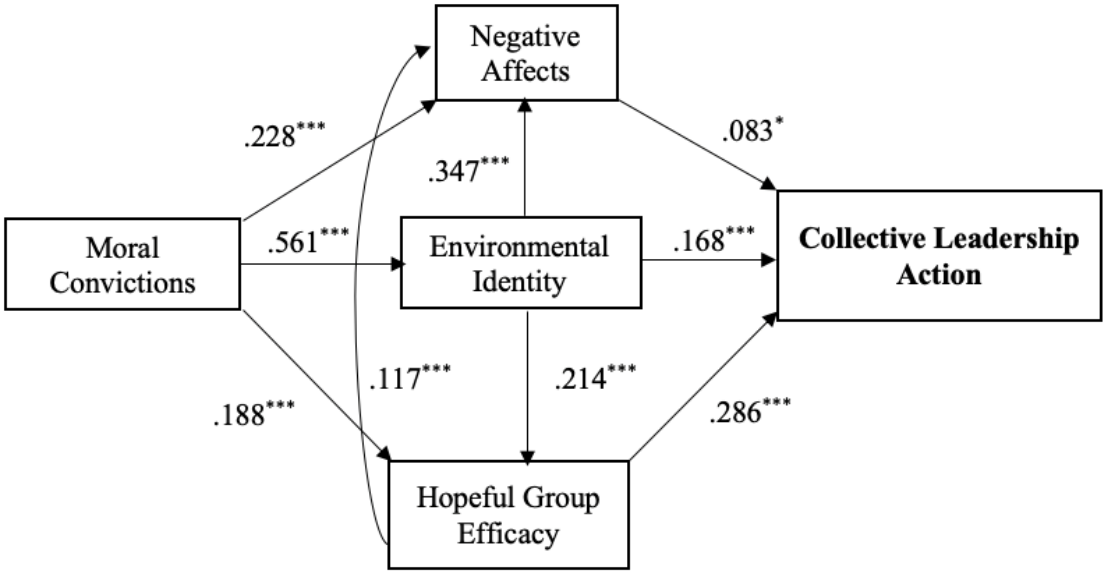


Figure 10. Estimates of the standardized coefficients found for the different relationship paths of the EIMECA model, including Hopeful Group Efficacy instead of Group Efficacy Belief: Collective Leadership Action.



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Author contributions

The three authors have contributed equally in all matters concerning this paper.

Competing interests

The authors declare no competing interests.

Additional information

This work constitutes part of Beatriz Carmona-Moya’s doctoral thesis in the doctoral program in psychology at the international graduate school of the University of Granada.

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The data of this study are available on request