Nature connectedness and environmental management in natural resources companies: An exploratory study

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Highlights

- Connectedness to nature in natural resources companies is analyzed with 50 interviews.
- Findings highlight the relevance for employees to maintain contact with natural areas.
- Connectedness to nature is related to the increased awareness of environmental issues.
- Respondents proposed practices to improve connectedness to nature.
- Contributions to the literature and practical implications are discussed.

Abstract

The objective of this paper is to analyze the meaning, manifestations and practical implications of connectedness to nature in natural resources companies. This research is motivated by the lack of scholarly works aimed to analyze the organizational applications of the connectedness to nature concept. A qualitative and exploratory study based on semi-structured interviews with 50 respondents was conducted. The findings highlight the feeling of disconnection from natural ecosystems that permeates most organizations and the importance for employees to maintain contact with natural areas. For organizations, the benefits of connectedness to nature are essentially related to the increased awareness of environmental issues, adoption of green behaviors in the workplace, greater attachment to place, improved communication with local stakeholders, and employee well-being. Respondents also proposed various practices to improve connectedness to nature, particularly the sharing of managers' sense of affiliation with nature, involvement of employees in nature-related tasks, implementation of specific human resource management initiatives, and promotion of outdoor activities. The findings might benefit diverse stakeholders such as scholars, organizations, managers, and public policy makers.

Keywords: Connectedness to nature; Environmental management; Biophilia; Organizational citizenship behavior for the environment; Natural resources organizations.

1. Introduction

The lack of direct interaction with the natural environment is one of the main characteristics of urbanized and modern societies (Beery et al., 2015, Mayer and Frantz, 2004). The pervasive effects of the loss of human-nature interactions and the importance of increased contact with natural ecosystems, including in terms of stress reduction, well-being, quality of life and health, have been widely studied (e.g. Howell et al., 2011, Nisbet et al., 2011, Seymour, 2016, Soga and Gaston, 2016). Nevertheless, the roles of organizations and workplace environments in the human-nature interaction have been overlooked in the literature (Restall and Conrad, 2015). Because most employees work in confined spaces (e.g. offices, factories, shopping centers) away from natural ecosystems, one can assume that modern organizations tend to increase the feeling of separation with nature (Hartig et al., 2014). Such separation, which may vary depending on the activity of organizations, could have an impact on the development of environmental concerns among employees, who are not necessarily aware of their interdependency with the natural world and impacts of organizational activities on surrounding ecosystems. From this perspective, the development of connectedness to nature could contribute to improve their awareness of the environmental impacts of organizational activities and to encourage green initiatives in the workplace. Connectedness to nature (CN) relates to the individual predisposition to affiliate with nature; this concept is close or related to the concept of biophilia (see subsection 2.1). Although increased nature connectedness has been found to improve environmental concerns and behaviors, such as the general ecological behavior and willingness to sacrifice for the environment (Davis et al., 2011), vegetation protection behaviors (Gosling and Williams, 2010), and high effort pro-environmental behavior (Ramkissoon et al., 2013b), its concrete effects on several organizational aspects (e.g. strategy, processes, structure, relation to employees) remain to be studied.

The objective of this paper is to explore the meaning, manifestations and implications of CN based on an empirical study of natural resources companies. To keep analyzing the concept of CN is relevant because, as underlined in the scholarly literature (e.g. Mayer and Frantz, 2004, Mayer et al., 2009, Perrin and Benassi, 2009, Restall and Conrad, 2015), shedding light on the relationship between people and nature has the potential to enhance the effectivity to meet sustainability goals. Similarly, it is relevant to link this concept to employees because the importance of improving the environmental concerns of employees has been demonstrated in the literature (e.g. Daily and Huang, 2001, Perron et al., 2006). The study is focused on natural resources industries, and not on other industries (e.g. manufacturing, logistics, finance), due to the high sustainability impacts of these companies (Hilson and Murck, 2000, Wishart, 2012). Similarly, mining, energy, and forestry sectors were chosen because the exploitation of natural resources in those sectors have been blamed among the most relevant one for undermining fragile ecosystems (Kitula, 2006, Wishart, 2012). Purposeful or theoretical sampling principles (Maxwell, 2012) were used to identify relevant participants from those sectors of activity.

This study is important for at least three reasons. First, the literature on CN has largely ignored environmental management and organizational behavior (Restall and Conrad, 2015). As a result, the practical and organizational applications of the CN concept have remained very limited. The exploration of the organizational implications of CN sheds more light on how it can be translated in the workplace to address specific environmental challenges. Second, although, as stated, the importance of improving the environmental concerns of employees has been demonstrated in the literature, the meaning, emotional aspects and implications of such concerns were rarely specified. The concept of CN makes it possible to focus on an essential and understudied facet of

environmental concerns, namely the personal feeling of connection with natural ecosystems, and its possible implications for environmental behaviors. Third, perceptions of nature in environmental management tend to be abstract, distant and disconnected from emotional aspects (Shrivastava, 1994). The promotion of CN by organizations could contribute to ameliorate this disconnection, and benefits could extend beyond environmental management (e.g. work satisfaction and well-being, place attachment, motivation). Nevertheless, how organizations can encourage CN has not been studied in the literature.

Considering the insights above, the following research question could be made explicit: Which are the meaning, manifestations and implications of CN for the natural resources companies? The method used in this study to address this question is based on an inductive and iterative process of analysis of the qualitative data from semi-structured interviews, which is appropriate for this exploratory study, focusing on meanings rather than on the validation of predetermined hypotheses (Maxwell, 2012, Punch, 2013). The rest of the paper is structured as follow. First, the literature on CN and its possible implications for environmental management are presented. Second, the methodology of the study in terms of data collection and analysis is described. Third, the main findings are organized around three themes: the impact of the feeling of disconnect between organizations and the natural environment, the perceived benefits of an increased connectedness to nature among employees, and possible initiatives to increase CN in the workplace. Fourth, the main findings of the study are discussed. Finally, the contributions to the literature and avenues for future research are included in a final section of conclusions.

2. Theoretical review: connectedness to nature and environmental management

2.1. The biophilia hypothesis and connectedness to nature

CN can be defined as the sense of affiliation with nature and feeling of well-being resulting from increased contact with natural ecosystems (Haans, 2014, Restall and Conrad, 2015). The sense of CN has been the object of an increasing number of studies over the last decade (e.g. Mayer and Frantz, 2004, Mayer et al., 2009, Perrin and Benassi, 2009). Drawing on the biophilia hypothesis and the literature on environmental psychology, those studies have shed more light on the various facets and implications of the identification and commitment to nature (Martin and Czellar, 2017, Nisbet et al., 2009, Restall and Conrad, 2015). According to the biophilia hypothesis, most people have an inner sense of attachment, affiliation and connectivity with nature. Such attachment has been related to psychological, historical, spiritual and genetic aspects (Gullone, 2000, Howell et al., 2011, Kellert and Wilson, 1995, Martin and Czellar, 2017). Nevertheless, the increasing urbanization and industrialization of modern societies have undermined psychological and physical contact with nature (Beery and Wolf-Watz, 2014, Mayer and Frantz, 2004). In most regions worldwide, the urban population is booming and now represents approximately 80% of citizens in industrialized countries (Beery et al., 2015). The separation from nature in modern cities and organizations has important psychological and social impacts, which can explain the need of many people to reconnect with the natural environment (Wilson, 1984).

Overall, the literature has focused on the development of measurement scales, determinants and implications of CN. First, the level of connection to nature has been analyzed and measured

through various concepts such as commitment to nature, emotional affinity with nature, nature relatedness, inclusion of nature, connectivity with nature, or environmental identity (e.g. Nisbet et al., 2009, Perkins, 2010, Restall and Conrad, 2015, Schultz et al., 2004, Tam, 2013). Although measurement tools related to these concepts may appear slightly different, they cover closely related aspects, including the feeling of being part of an ecosystem, the sense of attachment, love or oneness with nature, and the experience of well-being related to the natural environment (Restall and Conrad, 2015, Tam, 2013). As summarized by Restall and Conrad (2015, p. 10) in their study on CN constructs, "Research indicates that there is strong convergent validity amongst the different measures due to their similarity, and functional associations".

Second, the determinants of CN have been analyzed, particularly in relation to location, values, identity and spirituality. The role of location on CN has been shown through socio-spatial data and studies on attachment to place (e.g. Brown et al., 2015, Restall and Conrad, 2015). These studies have explored the role of attachment to specific physical places in the development of sustainability concerns and pro-environmental initiatives (Beery and Wolf-Watz, 2014, Gosling and Williams, 2010, Ogunseitan, 2005). The concept of topophilia (Tuan, 1990), which can be defined as "the human being's affective ties with the material environment" (Tuan, 1974, p. 93), is often used to describe how topographic and geographic specificities tend to shape local values, perceptions and personal preferences, including in terms of natural environment. Research has also investigated the role of environmental values on CN. Although measures of environmental values – such as the New Environmental Paradigm Scale – are generally based on general and cognitive rather than personal and affective aspects (Mayer and Frantz, 2004), some studies have found correlations between this type of values and CN (Mayer and Frantz, 2004, Perrin and Benassi, 2009). The roles of spirituality, meaning in life and identity in CN and respect for nature have also been studied (Hoot and Friedman, 2011, Howell et al., 2013, Kamitsis and Francis, 2013, Martin and Czellar, 2017, Trigwell et al., 2014).

Third, the implications of CN, particularly in terms of commitment to the environment and well-being, have also been investigated (e.g. Arendt and Matthes, 2016, Barbaro and Pickett, 2016, Gosling and Williams, 2010). The literature on CN assumes that individuals tend to take care of things and places they feel emotionally attached to. CN and place attachment have been found to encourage environmental commitment and behaviors in this area (Davis et al., 2011, Gosling and Williams, 2010, Kamitsis and Francis, 2013, Ramkissoon et al., 2013a). Similarly, in line with the biophilia hypothesis, CN has been associated with various variables related to well-being and psychological health (Gullone, 2000, Howell et al., 2011, Kamitsis and Francis, 2013, Zhang et al., 2014). Nevertheless, as highlighted by Restall and Conrad (2015, pp. 4-5) in their extensive review of the literature, most empirical studies have "analyzed CN from the psychological point of view" alone, and "office environments received no direct CN attention". As a result, the implications of CN for environmental management and organizational behavior have been overlooked. The lack of studies on the application of CN in organizations does not only concern office environments but also various types of activities and workplaces where employees may or may not be in direct contact with natural ecosystems.

2.2. From nature connectedness to environmental management

Although the need for further research on the practical applications of CN has been commented on (Restall and Conrad, 2015), the practical implications of this concept for organizations and its connection with the literature on environmental management remains to be investigated. Those implications revolve around four interdependent aspects: the need to reconnect organizations – and employees – with the natural environment, the management of environmental issues related to specific places and ecosystems, the importance of CN for environmental initiatives in the workplace, and the improvement of well-being at work.

First, the promotion of CN in the workplace could improve the environmental concern of the entire organization. Although the disconnect from nature and its pervasive effects are widely covered in the literature on CN (e.g. Beery et al., 2015, Nisbet et al., 2009), the role of modern organizations in this issue remains to be investigated. Most organizations are in urban areas and the working environment of employees is generally isolated from natural ecosystems. As a result, the vision of natural ecosystems in organizations tends to be abstract, distant and disconnected from the emotional experience of nature. This disconnect is reflected in the concept of the CASTRATED environment, coined by Shrivastava (1994) to criticize the characteristics of environment that permeates management: Competition, Abstraction, Shallowness, Theoretical immaturity, Reification, Anthropocentrism, Time dependent, Exploitable, and Denaturalized. Various studies have shown that this narrow and denaturalized view of the natural environment – predominant in most organizations – needs to be questioned to improve corporate sustainability and implement more substantial measures (e.g. Boiral et al., 2014, Byrch et al., 2007, Jermier, 2008, Purser et al., 1995). Because CN is based on emotional attachment to the natural environment, its development among managers and employees questions the CASTRATED view of the environment and encourages green initiatives in the workplace.

Second, high levels of CN may be associated with better management of environmental issues related to specific places and ecosystems. The literature has shown that CN and environmental behaviors are indeed related to attachment to place (Devine-Wright and Clayton, 2010, Gosling and Williams, 2010, Ramkissoon et al., 2013b). The location of certain organizations or activities in the vicinity of or within natural ecosystems (i.e. forestry companies, mining operations, tourism activities) increases CN, place attachment and environmental initiatives among employees, particularly those who live nearby. Similarly, CN and place attachment can encourage knowledge of local ecosystems, which is essential for the management of certain environmental issues such as biodiversity conservation. For example, various measures for biodiversity, such as vegetation monitoring, identification and preservation of fauna biodiversity, or inventory of threatened species, require an intimate knowledge of specific ecosystems (Boiral and Heras-Saizarbitoria, 2017, Lazdinis et al., 2007). Employees with high CN and place attachment are more motivated and better placed to implement this type of measure. The same applies to the improvement of relationships with stakeholders that can be affected by corporate activities, including local residents and indigenous people. For example, the demonstration of CN and place attachment by managers can help to reassure stakeholders, improve communication with them and build the social license to operate activities that may represent a risk for the preservation of ecosystems.

Third, CN can encourage the internalization of environmental issues in organizations, as well as voluntary employee initiatives. Many studies have shown that the implementation of environmental practices, such as the ISO 14001 standard, is often superficial and mostly intended

to improve corporate image (Christmann and Taylor, 2006, Heras-Saizarbitoria and Boiral, 2013, Iatridis and Kesidou, 2018). The improvement of environmental practices and performance requires a substantial rather than symbolic commitment from employees. Such commitment is not only based on mandatory procedures and policies. It also depends on organizational citizenship behaviors for the environment (OCBEs) which can be defined as individual, voluntary and non-rewarded pro-environmental initiatives in the workplace (Boiral et al., 2015, Daily et al., 2009, Paillé and Boiral, 2013). The aggregated impact of OCBEs can significantly improve the environmental performance of organizations. Nevertheless, the literature on the drivers of OCBEs has essentially focused on their extrinsic and organizational determinants, such as the managerial and organizational support, social exchange processes, job satisfaction, and corporate policies (e.g. Boiral et al., 2015, Paillé and Boiral, 2013, Paillé et al., 2016, Temminck et al., 2015). Individual and intrinsic motivations for OCBEs have been overlooked (Boiral et al., 2018b). Because CN is based on emotional affinity with nature and is conducive to environmental commitment, it plays a significant role in the development of OCBEs and improvement of environmental performance.

Fourth, CN can have an impact on well-being and effectiveness at work. Although the managerial applications of the biophilia and CN concepts remain under-explored, the experience of well-being and stress reduction related to contact with the natural environment (e.g. Cervinka et al., 2012, Howell et al., 2011, Howell et al., 2013) also applies in the workplace. Some studies in the area of health, environmental psychology and interior design have shown that green buildings and the introduction of various environmental features in the workplace (e.g. natural working environment, live interior plants, creation of green spaces, visual contact with outdoor natural landscape) can improve job satisfaction, attention capacity, employee well-being and productivity (e.g. Dravigne et al., 2008, Edwards, 2006, Grinde and Patil, 2009, Larsen et al., 1998, Nieuwenhuis et al., 2014, Raanaas et al., 2011). The findings of this emerging literature are generally in line with the biophilia hypothesis and show that this concept can have promising managerial applications. The development of measures to improve the CN of employees through environmental training, outdoor activities or measures for biodiversity conservation could have a positive impact on organizational effectiveness and environmental concerns.

It is worth noting that there are other alternative frameworks to analyze these relationships that could be at least mentioned (and which can't be reviewed in more detail at this point due to the length limitation of the article). Among many others, the behavioral framework proposed by the perspective of Corporate Social Responsibility (CSR) could be highlighted. Despite many of the CSR studies focus on organizations rather than individuals (Aguinis and Glavas, 2012), recent research has broadened this agenda by analyzing the psychological microfoundations of CSR (or micro-CSR) aiming to studying how CSR affects individuals (Aguinis and Glavas, 2012). From this perspective, there is a rise of employee-focused micro-CSR research (Gond et al., 2017, Rodrigo and Arenas, 2008, Rupp and Mallory, 2015, Slack et al., 2015), a research avenue in which this exploratory work could be also integrated.

In the absence of empirical studies of organizations and CN, the managerial and organizational implications of this concept remain theoretical.

3. Methods

3.1. Sample selection and data collection

Respondents were chosen among managers, experts and consultants working in the environmental field with a significant experience in the field of environmental management. Potential respondents were selected according to various complementary processes. First, publicly available sources were used to select environmental managers. Those sources included screening sustainability reports available in the Sustainability Disclosure Database published by the Global Reporting Initiative framework.[1] Selected reports from the mining, energy and forestry sectors were used to identify environmental managers or to find interesting companies in which potential respondents could be identified from their website. Second, professional social networking websites, such as LinkedIn, were also used to select potential respondents using keywords such as environmental or sustainability manager. Potential respondents, mainly from the mining, energy and forestry sectors, were then contacted using an email explaining clearly the objectives of the study and encouraging them to ask whatever questions they might have. Before the actual interview, respondents who agreed to participate in the study also had to sign a consent form previously approved by the ethics committee of the (blinded) University and assuring them of complete anonymity. Third, semi-structured interviews were conducted with selected respondents. Topics covered in the interviews included the drivers of CN related to the personal and professional life of respondents, the effects of the disconnect from nature, and the relationship between CN and individual environmental initiatives in the workplace. As respondents were from various locations worldwide – which could be remote – interviews were mostly conducted by telephone or by Skype. Various studies have shown no significant differences between telephone and face-to-face interviews (Holt, 2010, Stephens, 2007, Sturges and Hanrahan, 2004, Talbot and Boiral, 2013). Fourth, snowball sampling (Biernacki and Waldorf, 1981, Miles and Huberman, 1994, Noy, 2008) from the initial pool of respondents was also used to recruit more participants.

Fifty respondents were interviewed on specific topics related to CN. As this concept is somewhat personal, there was variability in the amount of data collected from participants. Interviews usually lasted between 45 min and 2 h, and were mostly conducted in English, with some conducted in French or in Spanish. Interviews were tape-recorded to facilitate data analysis. Limiting the number of interviews was justified by the phenomenon of theoretical saturation (Creswell, 1998, Strauss and Corbin, 1998). Table 1 summarizes the sample composition.

Table 1. Sample composition of respondents.

	Status of respondents				
	Managers	Auditors and Consultants	Scientists and Researchers	Other	Total
Mining sector	12	3	0	0	15
Energy sector	4	0	0	0	4
Forestry sector	2	4	2	2	10

[1] http://database.globalreporting.org/, accessed on February 5, 2018

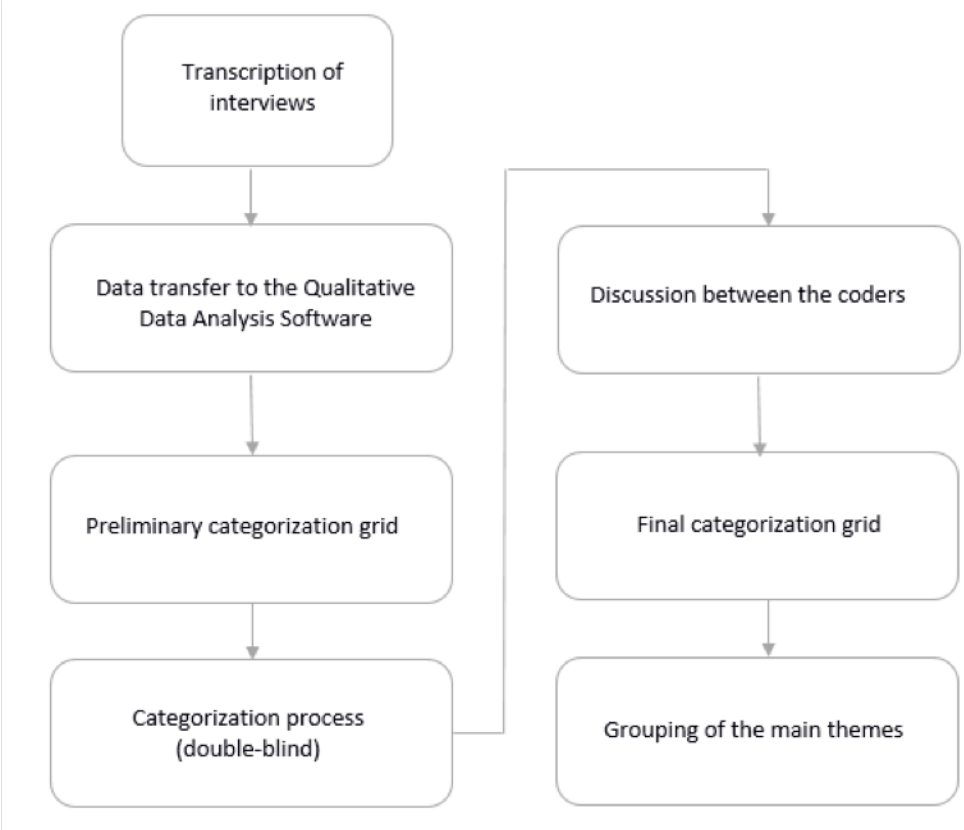
Other	8	8	2	3	21
Total	26	15	4	5	50

3.2. Data analysis

Qualitative data analysis was based on the grounded theory, which implies that recurring themes emerged from the data, as opposed to the hypothetico-deductive reasoning approach involving the validation of predetermined hypotheses (Glaser and Strauss, 2017, Suddaby, 2006). The analysis followed a eight-step process (see Fig. 1). First, all interviews were transcribed verbatim using the Word software. Transcribed interviews comprised 735 single-spaced pages. Second, all those data were transferred to the QDA Miner software (Version 4) to perform the qualitative data analysis. Third, we performed multiple readings of the transcriptions of the 50 interviews and, for the axial and selective coding, a constant comparative methodology (Schwandt, 2007) was used in order to develop a tentative line of theorization from the interviews. Fourth, a preliminary categorization grid was created based on the topics covered and the data collected. Each category was clearly defined and discussed by the research team to facilitate data interpretation and improve validity. Due to the inductive and iterative process involved in the grounded theory, the categorization grid was dynamic and evolved throughout the categorization process. Fifth, data were categorized according to the developed grid. The categorization process was conducted independently by two experienced coders on approximately a quarter of the data. This double-blind coding process allowed us to validate the categorization grid and to improve it in order to reduce any interpretation bias. Sixth, the coding process was discussed between the two coders. Seventh, following discussion between the coders, new categories were created, while others were merged or subdivided. At the end of this process, the coding by the two coders was very similar and did not lead to significant biases in the interpretation and the validity of the data. 18 relevant categories, including 479 passages focusing on the CN concept, were retrieved. Eighth, those relevant categories were grouped into three main themes covering the research objectives:

- The feeling of (dis)connection from the natural environment and its impacts;
- The benefits of increased CN among employees;
- The possible organizational initiatives to promote CN.

Fig. 1. The process of qualitative data analysis.



Finally, the most relevant passages related to those main themes were selected and translated into English by the research team if necessary. The key findings related to each of the main themes were also summarized. Even though quantification is still a very controversial issue in qualitative research (Gephart, 2004, Hannah and Lautsch, 2011, Pratt, 2009), certain tendencies were estimated when it seemed relevant. However, in most cases, quantification is not appropriate to qualitative data analysis based on grounded theory and should be avoided.

4. Results

4.1. The (dis)connection between organizations and the natural environment

The disconnection between organizations' daily activities and the natural environment were spontaneously mentioned by 38% of the respondents. Whatever their occupation and activity sector, most respondents recognize that organizations and modern life in general tend to work in isolation from natural ecosystems. This isolation from nature was always described in negative terms and its effects on individual mental health, stress level or well-being were often mentioned. The pervasive effects of the disconnection from nature for organizations were also highlighted, including the lack of environmental concerns, misunderstanding of natural ecosystems, or communication issues with local populations. Among other things, the remoteness from nature and field operations of company managers and decision centers were criticized:

> "Big mining companies have their head office in large cities such as Toronto and Vancouver. Bringing managers to the mining sites would help them to better understand the impacts of operations on environment and aboriginal people. Fieldworkers are seeing those impacts first-hand but not the managers staying inside their office!" (Director in the mining sector)

> "I think it's important to get out in nature. Although I think my job is important, I do spend most of my time in spreadsheets and looking at computers." (Environmental scientist involved with various natural resources sectors)

> "Living a modern life, we don't really have much opportunity to be in nature. I think that it's the same thing for my colleagues. If we were living in the countryside, I guess we would be more concerned about the environment." (Director in the mining sector)

Although the CN concept was rarely explicitly used during interviews, the importance of the feeling of connection, attachment and oneness with nature was mentioned by virtually all the respondents. In 90% of the cases, comments related to the personal connection with nature were not related to the working environment or organizational activities but rather to the personal experiences, family history or values of respondents. Leisure activities such as hiking, birdwatching, fishing or hunting were mentioned by 41% of the respondents. The importance of the place of residence on CN was also mentioned. The close proximity to nature of the past or present place of residence has clearly a strong impact on CN. Whatever the reasons behind respondents' CN, personal experience and connection with the natural environment were most often associated with a feeling of well-being and a more intimate understanding of the interdependency between human beings and surrounding ecosystems. In some cases, CN clearly influenced the educational pathway of respondents and their decision to work in the environmental field:

> "The connection to nature is very, very important to me. I have discovered this later in life when I started going outdoors and visiting absolutely extraordinary places. Seeing how some exploitation of natural resources can destroy or modify the natural state of the land hurts me. I am very aware of this. That was the reason why I wanted to study environmental law and work to protect the natural environment." (Legal adviser involved with various natural resources sectors)

> "My favorite thing to do is to go walking through the woods. The places I love best are the ones with a lot of species that are relatively healthy. So I think assuring that those places are protected and survive is very important because we depend on healthy ecosystems for our survival. And I think that we have an ethical obligation to not let things go extinct." (Environmental consultant)

Interestingly, although the workplace tends to be associated with a disconnect from the natural environment, certain occupations and organizational activities can encourage CN. First, the activities of natural resources companies in remote areas and the direct observation of their environmental impacts can increase the sense of attachment to nature and the feeling of being connected with a fragile ecosystem. Second, because of the location of these activities in natural

and rural areas, employees often have to move and live for a certain period of time in areas characterized by rich and diverse ecosystems. Exposure to beautiful landscapes and specific fauna and flora during these periods was mentioned by some respondents to explain their personal CN. Third, the occupation of most respondents was related to the management of environmental issues, which implies connection to the natural environment, including occasional visits to the field for various purposes (e.g. impact measurements, biodiversity inventory, meetings with aboriginal populations). Those activities tend to strengthen the CN of environmental specialists:

> "Working in the environmental department clearly changes the perception of or the link with the environment, perhaps because we are more exposed to the fauna and flora. I think our perception shifts when we are more exposed to biodiversity." (Environmental director in the mining sector)

> "Because I have the opportunity to work in the Yukon, I have the ability to become a lot more connected to nature than some." (Environmental manager in the mining sector)

> "Working with companies has given me the opportunity to work in natural areas, like the northern arboreal forest and native grasslands. Of course, these are areas where I feel that conservation is crucial and I feel a connection to them." (Environmental scientist involved with various natural resources sectors)

4.2. The organizational benefits of connectedness to nature

The positive effects of CN were spontaneously mentioned by 40% of respondents and they mainly concerned four interrelated benefits: knowledge of place and local communities, awareness of environmental issues, feeling of well-being, and adoption of green behaviors.

First, 75% of the CN benefits mentioned by respondents were related to a deeper knowledge of a specific region and improved communication with external stakeholders, particularly indigenous populations. Because of their sense of CN in a given region or ecosystem, individuals are more inclined to visit those places for professional or personal reasons. Such visits tend to develop a more intimate knowledge of the natural environment and surrounding populations. A few respondents emphasized that this type of knowledge is very different from the analytic, factual and scientific knowledge that predominates in their work activities, particularly in relation to environmental issues. CN is conducive to a more holistic and existential understanding of nature, and facilitates communication with stakeholders, particularly local residents who often share this holistic view of nature conservation. The example of aboriginal people who have a deeper relationship with nature was often mentioned to illustrate the importance of understanding or sharing the sense of attachment and oneness with nature to build trusting relationships:

> "To me, it's pretty natural to see the importance of aboriginal communities and their relationships with the land, their spiritual and cultural association with nature, etcetera. I would say that, philosophically, that's more of my mindset, so it's a pretty easy connection." (Environmental manager in the mining sector)

> "Outdoor activities make me more aware of nature. And then, of course, I have developed relationships with some indigenous communities, and they are telling me about their way of walking on the territory and the knowledge they have." (Legal adviser involved with various natural resources sectors)

Second, 70% of those respondents who highlighted the benefits of CN mentioned an increased environmental awareness among employees and managers alike. This awareness is explained by the feeling of attachment and interdependence with ecosystems that may appear threatened by organizational activities. Such threats are quite obvious and visible for activities based on exploitation of natural resources, such as mining and forestry. As a result, the environmental impacts of those activities are not perceived in general, impersonal and abstract terms, but affect the well-being and psychological integrity of respondents with CN more directly and personally. This seems to encourage a deeper understanding of environmental impacts and a more critical position with regard to polluting companies:

> "When I walk in the park, when I see the birds, I feel that the world is vast and has an amazing variety of biodiversity. But it's actually possible that, over time, much of this biodiversity would simply not exist anymore. And for me it's a fundamental problem." (Environmental manager involved with various natural resources sectors)

> "Having been in Northern Quebec, I think it's a much more fragile environment. I do find that the flora and fauna there are more vulnerable. So I am very concerned about the impacts of our sector in the northern environment." (Environmental director in the mining sector)

> "Awareness of these areas increases my ability or my attention to detail when it comes to their protection. I'm going to be much more likely to recognize impacts that can be mitigated if it's to an area that I am conscious needs to be protected or studied." (Environmental scientist involved with various natural resources sectors)

Third, in 40% of the cases, the benefits of CN were associated with increased well-being and mental health. Although these benefits may appear somewhat disconnected from the workplace, respondents highlighted their positive effects on organizational behavior and motivation. For example, increased CN can contribute to stress reduction at work and employee retention, particularly for individuals attached to the surrounding region. These benefits increase when work tasks involve frequent contact with the natural ecosystems, which is often the case with employees of the environmental department of natural resources companies. The effects of CN on effectiveness, job satisfaction and commitment to the organization were also mentioned:

> "For your job, you get to go out and be in the environment, and often you get to go to these amazing places that not many other people have been to. So we're very lucky working in the environmental field." (Environmental manager in the mining sector)

> "I feel a deep connection to the environment and nature. I think it is a huge part of de-stressing in people's lives, in their wellness." (Environmental scientist involved with various natural resources sectors)

> "There's a feedback loop. While you're participating in environmental protection, you get to be immersed in nature to more of a degree than the general person working for a company in an urban center. And it just solidifies the importance of the environment for your mental health and well-being." (Environmental scientist involved with various natural resources sectors)

Fourth, 30% of respondents who highlighted the benefits of CN mentioned its effects on the adoption of pro-environmental behaviors. Those behaviors are partly related to the environmental awareness ensuing from CN. And CN seems all the more likely to result in behavioral changes in the workplace because it is related to specific places around the organization that can be clearly impacted by corporate operations. A feeling of connectedness to the natural environment in general or to some areas away from the workplace (i.e. a natural park in another region, a specific type of landscape, a set of endangered species in a remote region) is not necessarily conducive to environmental initiatives in the workplace, particularly if the concrete effects of those initiatives are not clearly perceived or remain theoretical. The operational effects of CN depend on the perceived interconnectedness between the preservation of natural ecosystems to which individuals really feel connected and organizational behaviors:

> "I firmly believe that people who have a connection to the environment will be more vested in saving it. For example, if you've been to a place where logging or a mine is supposed to go, and you hike or you ski there regularly, you're much more likely to want to save it than if it's just a place or a dot on a map." (Environmental manager in the mining sector)

> "You get a lot more out of establishing hiking or snowshoe trails in and around a mining site than you would just giving an environmental orientation via PowerPoint for an hour. If people are out and see the wildlife and if they understand the issues with conservation, they are more likely to care than if they just have to sit and get an orientation, sort of told at them." (Environmental manager in the mining sector)

4.3. Reconnecting organizations with the natural environment

Although the organizational benefits of CN are partly related to contextual aspects (e.g. activity sector, locality, occupation of respondents) beyond the control of managers, various measures can be implemented to reconnect employees and organizations as a whole with the natural environment. Those reconnection measures revolve around four interdependent aspects: involvement of employees in nature-related tasks, promotion of outdoor activities, implementation of specific human resource management initiatives, and sharing of managers' personal connection to nature.

First, 61% of respondents suggested reconnection measures, and argued that increased CN can be developed through employee commitment in nature-related tasks. Those tasks do not equally concern all environmental practices but, more specifically, those related to the outdoors. Examples of biodiversity practices, such as the implementation of ecological corridors, building of birdhouses, or control of invasive species, were mentioned by some respondents. Similarly, the observation and measurement, in natural areas, of environmental impacts can improve CN and

environmental concern in general. Although this type of task is usually performed by the environmental department, some organizations have allocated specific environmental tasks or positions to employees in order to strengthen their CN and awareness of local ecosystems. Such task delegation also improves knowledge of corporate environmental issues and understanding of environmental impacts of certain operations of the organization:

> "We have a position in the environmental department for which factory workers very often apply because it is a great opportunity to go out and walk around the tailings sites. They often come back to the office trying to show us animal pictures taken in the field. Their connection to the environment is clearly changed by working in the environmental department, probably because they are more exposed to the fauna and flora." (Environmental director in the mining sector)

> "Our employees have noticed some of the animals that might be put in the spotlight on our site, like the northern leopard frog. This is an opportunity for them to learn and share about species at risk with their relatives, to take care of them on our site and to see the value that the company puts on the environment." (Environmental manager in the mining sector)

Second, around 57% of respondents have mentioned the importance of organizing outdoor and nature-related activities to develop CN. The promotion of sporting and recreational events in nature (e.g. funding of outdoor activities involving employees, organization of specific events in the surrounding countryside) was mentioned by a few respondents. Those activities are often not only for staff and are therefore also intended to strengthen ties with local communities. Similarly, encouraging employee volunteering in natural conservation activities (riverbank cleanup, involvement in natural conservation organizations, hiking trail maintenance) can improve both CN and stakeholder relationships. Such activities can be sponsored by organizations or even be done, at least in part, during working hours. Finally, some respondents highlighted the importance of outdoor activities specifically dedicated to a better understanding of surrounding ecosystems and communities, especially for new recruits:

> "We have to make sure that people feel connected to the certain areas where they go, not that they're just there for work. It should be a goal to make employees feel a connection there." (Environmental manager in the mining sector)

> "I think that the connection to nature is essential and requires direct contact with it. Whether we organize an annual day of volunteering in nature or a day of outdoor working, we need this direct contact." (Consultant in the mining sector)

> "It is important to get an actual experience of biodiversity, not like in a botanical garden, but in the actual nature. We must encourage experiences in nature to really understand the majesty, the beauty of it, and how we all depend on it." (Environmental manager involved with various natural resources sectors)

Third, according to 39% of respondents, specific human resource management and workplace design can stimulate employee CN. For example, environmental training can enhance CN, particularly when it is focused on natural conservation issues and increased awareness of the

surrounding environment rather than technical work procedures. The recruitment of employees with high CN or who have had professional experience in direct contact with nature (e.g. agribusiness, fishing activities) was also mentioned. Finally, the greening of the workplace (e.g. interior plants, window view, possibility to take outdoor breaks) was highlighted, particularly in organizations where many employees work in closed spaces, such as mining:

> "I think enabling the exposure and access to the natural environment is incredibly beneficial, especially in the areas where the mining sites are." (Environmental manager in the mining sector)

> "It helps to have new offices with green spaces and windows to see outdoors. We also need activities where people are able to go out, to be in contact with nature." (Researcher in the forestry sector)

> "I think companies should make sure to introduce their employees to their surrounding environment. They should explain to them, through training programs for example, how the project is being executed in a specific environment." (Environmental scientist involved with various natural resources sectors)

Fourth, the importance of the managers' personal connection to nature was mentioned by 22% of respondents. Although CN may appear as a personal and invisible psychological aspect, it can be reflected in various behaviors or attitudes (e.g. informal discussions with employees, managers' outdoor activities, attachment to place). Those informal and extra-role aspects send a signal about the importance of CN, nature conservation and environmental behaviors that can be emulated by employees. A few respondents contrasted managers with high CN and a genuine concern for natural conservation with the superficiality of certain environmental practices and the greenwashing rhetoric that predominate in other organizations:

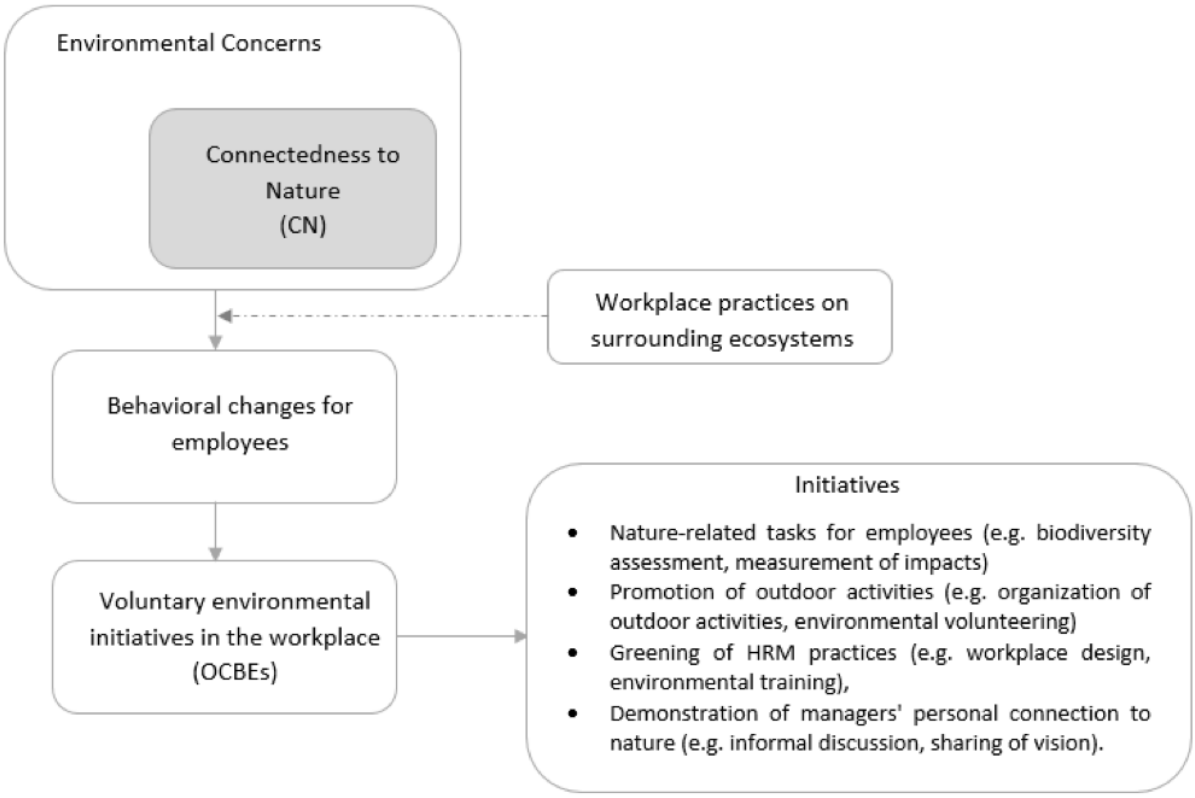
> "This is definitively the managers, those at the top of the pyramid, who really influence things. Personally, having this deep concern for the natural environment, I give myself the duty to try to influence people around me so that they become more and more aware of environmental issues." (Legal adviser involved with various natural resources sectors)

> "The concept of sustainable development and the ISO standards are often used superficially and only for marketing purposes. There's a lot of greenwashing out there. At the end of the day, it all depends on how leaders are really concerned about those issues, even employee involvement." (Legal adviser involved with various natural resources sectors)

5. Discussion

The examples and quotes provided in this paper illustrate how the concept of CN is translated in organizations in relation to actual environmental challenges, particularly in terms of nature conservation and deeper understanding of surrounding ecosystems. It also improves our understanding of the benefits of CN for employees and organizations. Fig. 2 synthesizes and models the relationships found.

Fig. 2. Main factors and relations evidenced in the study.



The literature on CN has been essentially focused on the development of various measurement scales and quantitative studies related to the biophilia hypothesis. Those studies have been important in measuring the relationships between CN and various variables such as attachment to place, conservation behavior and identity (e.g. Brügger et al., 2011, Gosling and Williams, 2010, Raymond et al., 2010, Scannell and Gifford, 2010). But most empirical studies of CN focus on specific behaviors outside the workplace and as it has been reviewed in the article, the organizational and managerial implications of CN have been overlooked in the literature. Then, the findings of this study increase our understanding of the details of CN, its organizational implications and meaning for employees.

Although the importance of employee environmental awareness has been highlighted, in general terms, in the literature (e.g. Boiral et al., 2018a, Daily and Huang, 2001, Perron et al., 2006), the nature of such awareness is rarely specified and may involve a large variety of issues (i.e. environmental policy, internal procedures, pollution prevention programs). Our findings show that, for employees, CN represents an essential facet of environmental concerns and can lead to behavioral changes, particularly when the impact of workplace practices on surrounding ecosystems is clearly perceived (i.e., this variable could act as a mediator). Because it is related to greater awareness of the surrounding ecosystems and of our interdependence on the natural environment, CN encourages voluntary environmental initiatives in the workplace (OCBEs). From this perspective, the findings of the article contribute to the literature on the drivers of OCBEs, particularly regarding the intrinsic motivations.

The paper sheds also light on the practical pervasive effects of the disconnect between organizations and the natural environment. This issue has been addressed in the literature, but mainly theoretically. For example, although the concept of CASTRATED environment (Shrivastava, 1994) clearly criticizes this disconnect, the concept has remained essentially theoretical. The results of the interviews conducted on CN show how the disconnect from nature is perceived in practical terms and what benefits can be expected from an increased CN. Organizational environmental issues are generally presented in a quite abstract and impersonal way in the managerial literature (i.e. indicators of environmental performance, implementation of environmental management systems such as ISO 14001, management of stakeholder relationships). Such an abstract presentation is isolated from personal experience and individual perceptions of the natural environment. Our qualitative study provides an insight into these perceptions, how they are shaped by CN, and answers some of the calls for further research on the ecological embeddedness of organizations (Allen et al., 2017).

Despite CN may appear to be a psychological construct independent of concrete managerial practices and organizational concerns, this study shows how it can lead or it can be connected to specific managerial measures. Examples of those measures could be implemented in various organizations and through a diverse set of initiatives, such as the ones identified in the fieldwork and summarized in Fig. 2.

6. Conclusions

This paper aimed to explore the organizational implications of CN in natural resources companies through a qualitative study of the meaning and possible managerial implications of CN rather than its measurement or psychological aspects. Interviews conducted with managers and environmental staff of these companies shed light on the feeling of disconnect from nature that permeates many organizations and the importance of CN for employee well-being and the development of environmental awareness.

This paper contributes to the literature in four complementary ways. First, the paper contributes to the literature on CN, as it increases our understanding of the details of CN, its organizational implications and meaning for employees. Second, the paper also contributes to the literature on the relevance of the employees for environmental management. This paper also bridges the gap between the literature on environmental psychology and environmental management, which have developed independently of each other. Third, the paper sheds more light on the pervasive effects of the disconnect between organizations and the natural environment. Fourth, the paper addresses the need for empirical research on the managerial and practical implications of CN underlined in the literature.

This work has a set of limitations that should be underlined. First, interviews were based on a limited sample of respondents ($n = 50$) composed of environmental specialists, consultants and managers. Therefore, common criticisms of qualitative research such as the lack of reproducibility and generalizability could be also mentioned as a limitation of the study. Much of these criticisms might result from the different approaches of quantitative and qualitative methods, as underlined

in the methodological literature (e.g. Denzin and Lincoln, 2000, Meadows, 2003, Punch, 2013). Similarly, despite its widespread use, especially for recruiting informants for multisource research, the limitations of snowball sampling, such as the problems of representativeness and the potential selection bias, should also be considered (e.g. Atkinson and Flint, 2001, Biernacki and Waldorf, 1981, Marcus et al., 2017). Second, the study focuses on natural resources companies, which are not representative of all organizations, particularly in terms of proximity to and direct contact with natural ecosystems. Such proximity and the tangible impacts of natural resource exploitation on the surrounding environment facilitate the implementation of measures to improve CN among employees, such as outdoor activities in the vicinity of the organization. Third, the managerial approach of this study overlooks certain psychological aspects underlying CN in the workplace.

The limitations of this study point to interesting avenues for future research. Future research could explore the managerial implications of CN in different sectors of activity and regions to shed more light on specific measures that can be implemented depending on the type of organization and its surrounding environment. Similarly, future studies could investigate, through a quantitative study based on a larger sample, the perceptions of CN among different types of respondents, including employees. Perceptions of natural ecosystems and experience of CN inside organizations may vary significantly depending on the location, values and occupation of respondents. Although the respondents highlighted the importance and practical implications of CN, how CN can be translated, into practical organizational behaviors and the internalization of environmental concerns needs to be investigated further. An interesting avenue for future research would be to measure, in a quantitative study, the relationship between CN and OCBEs, based on established measurement scales for these concepts. Other variables, such as the perceived organizational support, the activity sector, the location and the size of the organization, and the environmental values of managers could also be considered. Future studies could investigate the relationship between the consciousness development of managers and CN, which is likely to increase with the emergence of post-conventional stages characterized, among other things, by more altruistic values and systemic perspective. Such relationships could partly explain the benefits of consciousness development on environmental leadership (Boiral et al., 2014, Van Marrewijk and Werre, 2003). The role of the ecological self and ecocentric values (e.g. Allen et al., 2017, Bragg, 1996) on CN and environmental initiatives in the workplace could also be further investigated.

Declarations of interest

None.

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