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The 'desert experience': Evaluating the cultural ecosystem services of drylands through walking and focusing

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Abstract

1. Assessment of cultural ecosystem services (CES), the non-material benefits provided to humans by nature, is a particularly challenging activity within the complex field of ecosystem service (ES) evaluation. Assessing CES of drylands presents an even greater challenge for at least two reasons. First, assessments of dryland ES are few and limited, particularly regarding CES. Second, CES evaluation methods, even qualitative ones, generally fail to provide a deep and holistic understanding of the dynamic relationship between nature experiences, culture and identity.
2. The current study uses a novel methodology to evaluate CES in a dryland ecosystem: walking-focusing interviews. In these interviews, participants are encouraged to focus on various aspects of their physical, mental and cognitive experiences as they walked in a natural desert landscape. The interview protocol enabled us to capture a wealth of knowledge regarding people's desert experiences.
3. Findings indicate that geological phenomena and other abiotic elements of desert landscapes rank high among participants' reported dryland CES, which inspire complex and multi-level experiences. Other prominent themes that emerged included imagination, relaxation, wind and quiet. As deserts are low in primary productivity and therefore display less conspicuous biological elements, the protocol was found to be particularly effective for addressing both their living and non-living CES.
4. The methodology of walking-focusing interviews is shown to be able to extract information pertaining to people's holistic experience of nature, which suggests that it is a powerful methodology for CES assessments of landscapes in general.

KEYWORDS
cultural ecosystem services, drylands, focusing, nature experience, walking interviews

1 | INTRODUCTION

> Despite its clarity and simplicity… the desert wears at the same time, paradoxically, a veil of mystery. Motionless and silent it evokes in us an elusive hint of something unknown, unknowable, about to be revealed. Since the desert does not act it seems to be waiting – but waiting for what? Edward Abbey, Desert Solitaire, p. 241.

As the above quote elucidates, the desert, with its silence, clarity and simplicity, can provide valuable experiences to humans, although these experiences may be difficult to assess or even understand. Lane (1998) describes deserts as fierce landscapes, arguing that it is not despite, but because of their profound vastness and emptiness, that deserts provide solace as well as encourage contemplation. Within the ecosystem services (ES) framework—one that conceives nature as providing crucial and beneficial services to humans—these aspects would be considered part of the cultural ecosystem services that deserts provide to individuals and societies (Safriel et al., 2005; Sagie, Morris, Rofè, Orenstein, & Groner, 2013). While there are several definitions for cultural ecosystem services (hereafter CES), they all focus on 'services' or benefits that nature can provide for humans that are intangible or non-material (elaborated in the next section). Today, in the wake of population growth and urbanization, drylands—areas characterized by scarcity of water—still offer a distinct refuge from urban life, which allows them to provide significant and often unique CES, but they themselves are also under increasing development pressures (Orenstein, Jiang, & Hamburg, 2011).

Some forms of development can contribute to the degradation of desert landscapes and their unique CES—regions that are already considered vulnerable ecologically, socially and economically (Portnov & Safriel, 2004; Reyers et al., 2009). Moreover, The United Nations' 2005 Millennium Ecosystem Assessment (MA), which played a significant role in raising scientific awareness regarding CES and the need to address and evaluate them, specifically noted drylands as being regions where the lack of knowledge pertaining to ES was so great that it hindered decision-making processes (MA, 2005).

This research addresses two distinct gaps in current knowledge regarding ES assessment: the first is the lack of methodological approaches to adequately assess the significance and depth of CES for human well-being (Blicharska et al., 2017; Hirons, Comberti, & Dunford, 2016; Milcu, Hanspach, Abson, & Fischer, 2013), and the second is the previously noted lack of research on dryland CES specifically (although see, as exceptions, Dudley, MacKinnon, & Stolton, 2014; O'Farrell et al., 2010, 2011; Orenstein & Groner, 2014; Sagie et al., 2013; Quintas-Soriano, Castro, Castro, & García-Llorente, 2016; Quintas-Soriano, García-Llorente, & Castro, 2018; Reyers et al., 2009). We introduce a novel methodology derived from the field of psychology for assessing CES in a way that adequately captures the depth and significance of CES to human experiences of nature, and we apply this methodology to an arid ecosystem. We first review the literature on CES and elaborate on the specific characteristics of dryland or desert CES,[1] and the importance and challenges of their evaluation. We then present our methodology for assessing CES—'walking-focusing' interviews. Next, the article will introduce the characteristics of the case study area—the Negev desert, Israel. It will then present and discuss the results of the case study to identify and characterize CES in deserts, based on a thematic analysis of 30 walking interviews performed in a Negev nature reserve.

1.1 | Assessing cultural ecosystem services

While CES definitions differ widely, several categories of CES have been noted consistently by large-scale international assessments. The Millennium Assessment acknowledged the importance of accounting for CES, which it defined as 'the nonmaterial benefits people obtain from ecosystems' (MA, 2005:40). Millennium Assessment CES categories include cultural diversity, spiritual and religious values, knowledge systems, educational values, inspiration, aesthetic values, social relations, sense of place, culture and heritage values, recreation and tourism (MA, 2005:40). For the purposes of this study, alongside those of the MA, we integrate the CES categories proposed by the UK National Ecosystem Assessment (UKNEA, 2014), the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES, 2016), The Economics of Ecosystems and Biodiversity (TEEB, 2017) and the Common International Classification of Ecosystem Services (CICES, 2018). A summary of the CES noted by each can be viewed in Table 1.

TABLE 1 Categories of cultural ecosystem services according to comprehensive conceptual and assessment frameworks

MA (2005)	• Spiritual and religious values • Knowledge and educational • Inspiration and aesthetic values • Social relations • Sense of place • Cultural diversity, culture and heritage values • Recreation and tourism
UKNEA (2014)	• Cultural values • Shaping identities • Well-being, mental and physical health • Obtaining skills and capabilities
IPBES (2016)	• Spiritual services • Recreation • Tourism
TEEB (2017)	• Recreation • Mental and physical health • Tourism • Aesthetic appreciation and inspiration • Spiritual experience and sense of place
CICES (2018)	• Scientific investigation • Education and training • Culture, heritage and aesthetic experiences • Symbolic and religious meaning • Entertainment

From these lists of CES, the six following general categories can be extrapolated:

1. Social and cultural identity
2. Spiritual values
3. Cognitive development
4. Recreation and tourism
5. Aesthetic values
6. Mental and physical well-being

For the purpose of this study, we used these six CES categories in our thematic analysis of the interviews as the categories guiding the analytical process. We also use these categories to discuss whether other methodologies, as well as the one proposed here, can provide a 'voice' to adequately address all of the different facets of CES, including their complexity, depth and intensity.

1.2 | Methodologies for CES assessment

There has been an explicit and ubiquitous call from scholars and practitioners for strengthening the contribution of cultural services to broader ES assessments and developing methodologies for conducting them (Andersson, Tengö, McPhearson, & Kremer, 2015; Chan et al., 2012; Felipe-Lucia, Comín, & Escalera-Reyes, 2015; Klain, Satterfield, & Chan, 2014; Luck et al., 2012; Martín-López, Gómez-Baggethun, García-Llorente, & Montes, 2014; Menzel & Teng, 2010). Some of these calls stem from the desire to de-emphasize the over-reliance on monetary indicators to value these services. Indeed, harsh criticisms of the monetization of nature in ES frameworks lead to questioning the ethical legitimacy of the entire enterprise of ES assessment (Dempsey & Robertson, 2012; Kosoy & Corbera, 2010; Luck et al., 2012). Others have suggested that elevating the role of non-monetary based assessments can, at least in part, correct this situation and salvage the utility of the conceptual framework (Gee & Burkhard, 2010; Hirons et al., 2016; Klain et al., 2014; Martín-López et al., 2014; Orenstein & Groner, 2014; Raymond, Giusti, & Barthel, 2018).

While biophysical and monetary evaluations are the main tools for other ES assessments, CES are more difficult to quantify, partially due to their highly subjective and complex nature (Chan et al., 2012; Fish, Church, & Winter, 2016). Examples of direct monetary valuations are actual expenditures for services and other related costs (e.g. travel expenses), while indirect evaluations include, for example, contingent valuation, revealed preference methods or studies surveying willingness to pay for access to certain CES (Daniel et al., 2012; Fish et al., 2016). Such economic assessments have the obvious advantage of being useful for cost-benefit analysis used in decision-making processes. This is especially true for certain services such as ecotourism and recreation, which are considered more suitable for monetary assessment than others (Chan et al., 2012; Daniel et al., 2012).

Other quantitative assessment methodologies are available, such as those that assess visitor numbers to nature sites, participant preferences and choices, short and long-term health effects of exposure to nature, etc. (Daniel et al., 2012; Fish et al., 2016). Other indicators that produce quantitative data used for CES evaluation can include condition and function indicators (e.g. number of trees per km^2), as well as intermediate services (e.g. number of scenic roads) (Hernandez-Morcillo, Plieninger, & Bieling, 2013). However, it is argued that attempts to assess other CES using quantitative tools, such as spiritual or identity services, would be inadequate and would supply very limited information as to the true value of such services (Chan et al., 2012; Daniel et al., 2012; Milcu et al., 2013; Raymond et al., 2018).

In addition to quantitative assessment methods of CES, there are also a growing number of qualitative methodologies intended to provide different types of insights towards a better understanding of CES. These methodologies not only provide the opportunity to include elements in CES evaluation that are especially difficult to quantify but also have the potential to help gain a deeper understanding of the diverse aspects of CES. Qualitative methodologies employed to assess CES include methods such as open or semi-open interviews, questionnaires and group discussions (including focus groups, deliberative valuation and workshops) (Barton et al., 2017; Eizenberg, Orenstein, & Zimroni, 2017; Orenstein & Groner, 2014), as well as field observations and document analysis (Daniel et al., 2012).

Existing qualitative and quantitative methodologies can express some part of these services, and can each produce data to assist scientists, stakeholders, professionals and decision-makers in gaining a better understanding of CES values. However, an approach integrating diverse types of methodologies is needed to provide a holistic view of CES (Chan et al., 2012; Daniel et al., 2012). Raymond and colleagues (2018) rightly argue that current methodologies for assessing CES cannot adequately capture the coproduction of services, or the complex human-environment interactions that create, exploit, modify, degrade and recreate cultural services. They assert that such assessments need to account for the dynamic, nonlinear, multi-level relationships between individuals, cultures and ecosystems. They suggest a shift towards what they term 'embodied scientific realism', which sees these three elements as inseparable.[2] They propose an embodied ecosystem approach, which acknowledges scientific knowledge as well as local ecological and indigenous knowledge. It thus brings a holistic set of relationships to the forefront of environmental management. These include the mind (emotions, perceptions), body (sensations, movement), culture (values, norms) and the physical environment. Finally, they suggest that CES assessment requires openness to different meta-theories of human-environment/nature relationships.

As suggested by Milcu et al., (2013), new assessment methods should also consider diverse approaches that capture the vague and intangible nature of CES, as they may contribute to 'the resolution of real-world problems in the management of human–nature interactions' (Milcu et al., 2013:44). Methodologies that can address these aspects of human experiences of nature, are not meant to replace existing CES assessment methodology, but rather, they would

be complementary by addressing previously underemphasized CES and by augmenting the meaning and dynamics of CES. Finally, CES researchers have recently called for interdisciplinary or transdisciplinary methodologies to fill these gaps, including methods and conceptual frameworks from the fields of psychology and ethnography (e.g. Fish et al., 2016; Hirons et al., 2016; Raymond et al., 2018). In the next section, we explain why these methodological considerations can be especially critical for CES assessment in drylands.

1.3 | CES in drylands: A special case

Since drylands are characterized as being low in primary productivity, they are also often perceived as devoid of the CES that are associated with greener landscapes. Landscape preference studies indicate that most people prefer green, vegetated environments and the presence of water in the landscape (Falk & Balling, 2010; Ulrich, 1977; Zube, Sell, & Taylor, 1982). Deserts, on the other hand, rank relatively low in terms of natural landscape preference. Herzog and Barnes (1999) found that preference and tranquillity were both rated lower for deserts than fields, forests and large waterscapes. This claim is further supported by the work of Real and colleagues (2000), in which respondents preferred the presence of water and green natural (non-artificial) landscapes on both cognitive and psychological levels. Shalev (2016) found that visualization of deserts, in comparison to 'green' landscapes, reduced respondents' perceived confidence in their ability to change negative habits and augmented feelings of stress. However, they found that desert landscapes were less stressful and more attractive when compared to urban landscapes.

Safriel (2009) has noted that some dryland attributes perceived as adversities may also be framed as positive services if other aspects of their potential are taken into consideration. For example, what some see as desert disadvantages, such as elevated levels of solar radiation and heat, can be turned into advantages, as they make deserts the perfect place for alternative energy production, algae farming and certain forms of aquaculture. These are part of what Safriel terms 'alternative livelihoods', which display decreasing dependence on the natural biological productivity of the area. Orenstein and Groner (2014) noted that two communities living in the same ecosystem, but separated by a national border, displayed markedly different capacities to turn disservices into services, depending on economic wherewithal and political and social organization. Additionally, although often studied less than other ES, the CES of drylands can have similar and even higher value than other types of ES. In the case of drylands in southern Africa, for instance, tourism was found to be an extremely significant ES (Egoh, Reyers, Rouget, Bode, & Richardson, 2009; Reyers et al., 2009; Wangai, Burkhard, & Müller, 2016). CES were also found to be particularly important in Israeli and Jordanian Arava Desert (Sagie et al., 2013), and in current case study site—the Negev desert. These included services such as tourism and eco-tourism, recreation, education and scientific discovery, and religious sites (Orenstein et al., 2016; Teschner, Garb, & Tal, 2010).

In terms of CES, the perceived desolate nature of drylands, often sparsely populated and featuring wide uninhabited spaces and relatively pristine environments, increases the attractiveness of deserts for residents and tourists (EMG, 2011; Safriel, 2009). Thus, rather than adopting a narrow approach to CES that sees only biological elements of the landscape providing services, some researchers (e.g. Termorshuizen & Opdam, 2009; Westerink, Opdam, Rooij, & Steingröver, 2017) promote the broader, multifunctional approach of 'landscape services' that includes both eco-physical and cultural/aesthetic aspects of environments.

A shift in the conceptualization of ecosystem services from a more restrictive definition focusing only on biological ecosystem components to inclusion of non-living components of the ecosystem allows for a much more holistic assessment of the diverse benefits provided by dryland ecosystems. The Convention on Biological Diversity (CBD), for example, defines ecosystems as 'a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit' (CBD, 1992). The UKNEA (2014) and CICES (2018) also foster an approach that includes both the biotic and the abiotic features of environments in the assessment of CES, including topographic and geomorphological attributes in their definition of these services, for example, geodiversity (UKNEA, 2014).

Inclusion of the concepts of 'geodiversity' and 'geological heritage' is important to the assessment of CES in drylands. Ruban (2017) contends that while, ecologically, the geological environment is often considered a mere 'container', geodiversity and geological heritage provide cultural services for individuals and societies and thus requires conservation. Generally, geodiversity can be understood as the various types of geological features on a given territory that lead to people's admiration of the geological uniqueness, complexity and beauty. The creation of the UNESCO Global Geopark network particularly demonstrates the growing recognition of the cultural significance of geological heritage. Geodiversity, as a foundation of dryland CES, can be a valuable resource, used for scientific investigations, education and tourism, which can all bring direct and indirect socioeconomic benefits to local communities (Ruban, 2017). Geodiversity, alongside other abiotic features, was also perceived as a valuable dryland service in several studies in Israel's Negev desert (e.g. Finzi et al., 2018; Reichel & Urieli, 2003; Sagie et al., 2013).

2 | MATERIALS AND METHODS

2.1 | Case study area

Approximately 52% of Israel's land area is considered dryland ecosystems. As in other dryland regions around the world, Israel's drylands are characterized by a warm and dry climate, with large temperature differences between day and night and between seasons (INEA, 2017). Land cover contains mostly sparse shrubs and annuals and solitary trees, with higher productivity in riverbeds. Annual precipitation is between 25 and 285 mm, with 75% of the precipitation falling between December and February and high

variance in total precipitation between years. Israel's drylands host approximately 1,330 plant species, 100 species of mammals and reptiles, 300 species of birds and many invertebrates. Climate change has also affected dryland areas, which see more extreme events such as floods and droughts (INEA, 2017:36–40).

The current study took place in the Har HaNegev region, using a marked trail in a nature reserve called 'Bor Hemet'. The trail begins about 20 km from Mitzpe Ramon (see Figure 1), a small town (population ~5,000) in the center of Israel's arid Negev Desert, and straddling the northern edge of the hyper-arid Ramon Crater (Finzi et al., 2018). The crater itself is a natural geological phenomenon and a popular nature reserve. There is also scattered Bedouin settlement and single-family farms in the vicinity of the town. Two of the main land uses in the area are designated nature reserves and military training areas—the two overlapping intermittently (Gordon, 2013). Other uses include agriculture, mineral and building material extraction, tourism and waste disposal (INEA, 2017; Orenstein et al., 2011).

The path length was approximately 3 km. It was selected based on the following criteria: (a) isolation from developed areas and offering the opportunity for immersion in nature; (b) relatively easy walking regarding length and topography, thereby accommodating for a variety of participants, and; (c) includes typical Negev desert landscape and associated plants and wildlife. Importantly, the walks were conducted during in autumn, when the extremities of weather would not be a dominant feature of the walks.

2.2 | Sample

Our sample consisted of 30 individuals[3] intentionally drawn from a variety of backgrounds and diverse in demographic characteristics in order to avoid a demographically homogenous sampling. A conscious effort was made to interview people of different ages (ranging between 12 and 76), genders (12 male and 18 female) and ethnicities (Jewish and Bedouin; diversity of religious observance and non-observant), and with various backgrounds in terms of level of education (with and without formal higher education; diverse disciplinary backgrounds) and occupation (e.g. teacher, scientist, tour guide, graphic designer, engineer, student, pensioner, etc.). Participants were recruited using social networks, personal contacts and advertising through a local research station. Importantly, not all the respondents had a positive predisposition towards desert landscapes. In fact, 10 of the 30 respondents explicitly stated that they disliked the desert.

As noted above, the objective of the methodology is to extract information from individuals regarding their personal experience of nature. Results do not purport to be statistically representative, but rather they give researchers insights into the authentic experiences and perceptions of individuals and their interactions with nature in drylands. This was also suitable for the two additional research objectives, which were to provide proof of concept for the methodology and to expand on the types of knowledge that can be extracted using this methodology in drylands.

2.3 | Walking and focusing: A new methodology for CES assessment

Walking interviews are useful for understanding dimensions of participants' spatial experience that might otherwise be difficult to

FIGURE 1 Study site in the Negev highlands. The aridity Index (AI) is based on the ratio between precipitation and evaporation. An arid climate is when 0.05 < AI < 0.2; and in a hyper-arid climate AI < 0.05. Map created using ArcGIS® software by Esri. Copyright © Esri. All rights reserved

elicit. They also have been found to encourage improved physical immersion and mental wandering (Pierce & Lawhon, 2015). All three attributes can be useful in gaining more insight into the way cultural services are experienced by individuals. Additionally, Anderson (2004) claims that, for geographers, 'conversations held whilst walking through a place have the potential to generate a collage of collaborative knowledge' (Anderson, 2004:1), which included atmospheres, emotions, reflections and beliefs, as well as catalysing access to intellects, rationales and ideologies. Anderson also argues that these additional types of knowledge can go beyond external knowledge (generated by what he calls 'centers of power'). This could therefore be seen as part of an effort to create more equitable and collaborative forms of knowledge (Mohan 1999 in Anderson, 2004:260).

Although walking interviews have become increasingly popular as an interview technique in the past two decades, Pierce and Lawhon (2015) noted that the methodology itself is seldom studied, and that most studies using walking interviews are conducted in urban environments. These are mostly based on 'go along' interviews, in which the interviewer follows participants as they choose their own path (Adams & Guy, 2007; Anderson, 2004; Kusenbach, 2003; Pierce & Lawhon, 2015). In the current study, researchers chose a single, pre-determined path in a non-urban area for all interviews, in order to compare respondents' impressions of natural features in a given environment.

In this study, we use a new methodology that combines walking interviews in natural landscapes and the technique of *focusing*. Focusing was developed by Eugene Gendlin for therapeutic applications, turning attention to the 'felt sense' the body provides, and focusing on parts of one's experience often perceived, mistakenly, as irrelevant 'background'. Focusing also emphasizes minimal content or influence by the listener, so as not to influence the authentic experience of the speaker or 'focusee' (Gendlin, 2007). Walking-focusing interviews would thus provide insight into place-based holistic *experiences*, in addition to opinions and preferences.

Eisenberg (2016, 2018) applied focusing and walking interviews in the framework of landscape architecture and landscape perceptions. Following the same approach, we designed a walking-focusing protocol that allows a very free flow of ideas, in which the interviewer only asks participants to focus on different aspects of their desert experience, thereby expressing their perceived CES (see below).

2.4 | Interview methodology and protocol: Walking and focusing in nature

For the purposes of the current study, the following protocol was used, incorporating the basic conceptual framework to the steps recommended by Gendlin (2007) for the practice of focusing. We asked participants to focus on different aspects of their experience using several prompts and follow-up questions, aimed to allow them to do this as they walked. The protocol was as follows:

1. First, focus on the physical experience of walking. What comes up?
2. Look around—what do you see? How does your body react to it? Why?
3. Focus on something close—'Zoom In'
4. Close your eyes and focus on other senses
5. Give a 'personal name' to your experience (Why did you choose it?)

We also adhered to the following general guidelines for administering the interviews:

- No further interviewer input, only follow-up questions;
- Ask: Why? What else comes up? Can you describe (this) for me?
- No judgement, no leading, accept what comes;
- Circle back to the person's experience as it takes place here and now.

2.5 | Data analysis

Interviews took between 15 and 25 min embedded within the 2–3 hr walks. They were recorded, transcribed and analysed using thematic analysis, which is widely used in qualitative textual analysis to identify patterns and themes relevant to a certain research question or field of inquiry (Braun & Clarke, 2006; Fereday & Muir-Cochrane, 2006). The process involves the following stages: (a) collecting the data (e.g. from interviews); (b) generating and assigning short descriptions or 'codes' to different sections in the text in order to organize the information; (c) searching for reoccurring themes among the codes, and; (d) explaining the way in which these codes appear in themes or patterns (Aronson, 1994; Braun & Clarke, 2006). Code analysis can be performed using several approaches: It can be theory or model-driven, or it can be bottom-up (field-based) or result from prior research (Boyatzis, 1998; Cho & Lee, 2014). For the purposes of this study, a theme was deemed as such if it was found in three or more interviews. A theme was considered strong if it was expressed by 10 or more participants. We also measured the overall or total frequency of the themes, in order to give additional 'weight' to themes that were, on average, mentioned more times by each participant (see Figure 2, 'total mentions' axis).

We used the six CES categories listed above as our theme-groups or meta-themes: (a) social and cultural identity; (b) spiritual values; (c) cognitive development (including knowledge, skills, education, reflection and inspiration); (d) recreation and tourism; (e) aesthetic values; and (f) mental and physical well-being (See Appendix 1 for the assignment of themes to CES categories). In the following section, we discuss the themes that relate to the aforementioned categories and additional insights obtained from the interview data.

3 | RESULTS

Participants described a variety of experiences, at times complex and/or involving several types or levels—physical, emotional and

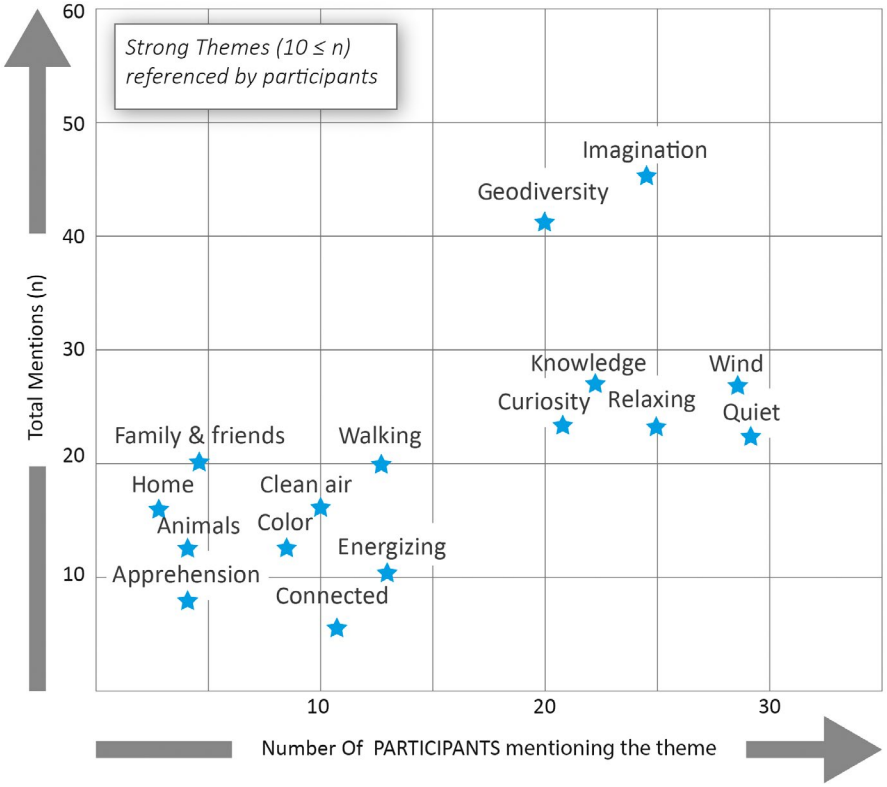

FIGURE 2 Strong themes mentioned by participants in Negev interviews

cognitive. Interviews contained information addressing not only their impressions of the 'here and now' but also mentioning past experiences, and including references to real or imagined personal, cultural or professional worlds of content. Some of the codes and themes were difficult to attribute to just one of the six categories below, which suggests that the meta-themes should not be considered as exclusive but rather as, at least occasionally, overlapping. The most common two dryland CES categories found in the analysis were cognitive development, and mental and physical well-being. They were followed closely by aesthetics and recreation, with factors in the two categories of social-cultural-identity services and spiritual services, reported the least (See Figure 2).

3.1 | Cognitive services: imagination, curiosity and knowledge

Imagination was found to be a strong theme, with references to possible past and future events (e.g. floods), comparing natural phenomena or objects to man-made constructions, seeing the desert landscape as reminiscent of biblical or ancient civilizations or even other planets. Another commonly imagined scenario was water flowing in the riverbed, either calmly or as a flood, with participants contemplating how that event would change the landscape in terms of geo- and biodiversity. The frequent reference to water was interesting because at the time of the interview there was no water anywhere on the path.

Curiosity and scientific knowledge pertaining to geological processes, as well as to the biological mechanisms and characteristics of desert plants and animals, were found to be of particular interest to most interviewees. Perhaps not surprisingly, locals and scientists had more knowledge about the desert and enjoyed displaying that knowledge, often explaining or demonstrating how it added value to their overall experience. One participant with a bachelor's degree in biology said:

> As someone who learned about botany and also a lot about desert plants, their ability to survive, their reemergence when they get wet, I mean they have this mechanism that keeps the seeds really well so that they don't sprout too early, so they actually have several defensive layers and after a certain amount of rain they're ready to open up. There's something half emotional about it. A type of suspiciousness that is like being suspicious towards humans. And the idea of how, how a plant even survives in the desert is something enchanting. Their meatiness, their ability to be exactly as they need to be. They're not trying, they're just a success of evolution. Other creatures and plants just died out. They're just optimally suited to be where they are.

Other cognitive connections and use of terminology to explain experiences stemming from one's professional or personal fields of content were also found to be a common theme. A history teacher imagined historical events; artists and participants who worked with graphics spoke about colour schemes, angels and composition;

biologists focused more on biological phenomena; a water specialist kept thinking about where the water flowed and how it impacted geological processes; and a camel herder mentioned where the camels walked or where a good place would be to sit and make coffee along the way while the camels rested or stopped to drink. Exemplifying several CES themes, one participant, a landscape architecture student, noted:

> These Atlantic terebinth [trees] really move me. I don't know, its…every tree like that…wow. You say to yourself, "How much? Which? What kind of conditions it survives! The stone, and you can really imagine, not really, but like, what did the water do here? How much power! I mean, up to there [looks at the depth of the crevices], up to that height, and the crevices, and it brings tears to my eyes. It's the most beautiful thing there is.

3.2 | Aesthetic values: Geodiversity, shapes and colour combinations

Aesthetic value was related to many of the experiences articulated by the participants, with strong themes relating to the positive aesthetic value of the geodiversity, with particular references to colour schemes and shapes. Trees, flowers and green plants were also considered as aesthetically pleasing but received less attention than geodiversity when not prompted by the interviewer. (If interviewees chose to focus only on non-living objects, the interviewer would then ask them to focus on something living that they experienced). Negative services or aesthetic disservices were experienced pertaining to dry ('dead-looking') plants, and at times to the general landscape that was considered 'lifeless'. These sentiments were most often expressed by people who claimed not to like the desert, and often called it a 'boring' landscape. However, it was also the case for some 'desert lovers', especially local residents, who expressed concern for desert organisms due to the particularly small amount of rain that had fallen that year in the area. Both groups expressed aesthetic pleasure to see green vegetation and flowers, as well as animal scat, some noting that it was a sign that the desert was still 'alive'.

In terms of geodiversity, natural caves and other areas providing shelter from sun and rain were mentioned often by participants as aesthetically pleasing. Stone structures, especially those perceived as reminiscent of human-made constructions, were also found to be appealing by several respondents. Larger geological objects, such as the mountains were also considered as aesthetically pleasing. Most notably, geodiversity, including the crater, the mountains, the caves and crevices, rock formations and other geological phenomena, as well as their colours and assorted layers and shapes, provided some of the most extreme, at times even emotional or spiritual, reactions from interviewees.

The following statement is a good example of how aesthetic experiences can relate to other levels or categories of CES. When depicting her reaction to the visual aspect of the landscape in front of a respondent whose family recently moved to the area, one participant said:

> For me, the main experience is that my heart is expanding, I have a lot of air. A feeling of space on the one hand and a kind of awe on the other. I…the wonders of nature, the power of the stones, the boulders, the contrast of colors…that "does it" for me. […] In my fantasy I want to live in the desert. It causes me to suddenly breath deeper, be calmer. Raise my eyes and observe. To downshift and take a slower pace. Put my worries and thoughts aside and understand that everything is small compared to the power of nature.

3.3 | Mental and physical well-being: Clean air, energy and relaxation

Main themes of mental well-being related to relaxation, de-stressing and a sense of peacefulness. While physical well-being was addressed frequently by all participants, it should be noted that the methodology itself prompts, or at least encourages, them to do so. This is because focusing is designed in a way that urges focusers to repeatedly address the physical or sensory aspect of their experience, the body's 'felt sense', and only then to continue to consider the other aspects of that experience (Gendlin, 2007). Nonetheless, the themes themselves within this category can still be assessed and can still give insight into what type of services drylands offer to people. Participants alluded most often to the quiet, the clean air (that facilitated breathing), the touch and the sound of the wind and the pleasant autumn weather as contributing to their physical enjoyment; this, in addition to their enjoyment from the physical activity of walking in nature, as previously mentioned.

Another strong theme was feeling energized, and another was a sudden urge to do various physical activities inspired by the participants' experience: run, climb the mountains, play on the rock formations, lay on the ground and look at the sky or sleep, fly, walk barefoot or explore one of the caves. One participant said:

> I feel so unmotivated all the time. Like I lack any desire [to do anything]. And suddenly, I don't know, hiking [here] gave me a sense of inner peace. It fills me with energy […], adrenalin and a desire to do something […]. It's like I imagine myself, while I'm walking, going home and turning the music up to full volume and jumping on the bed. Those kind of energies, these fun energies, like an electric current through my body.

Themes of physical and mental well-being, including relaxation and peacefulness, were expressed by all types of participants, including by some of those who claimed to not like the desert. However, the latter also frequently explained that they were not enjoying this experience as much as they would have in a greener natural area, as they are not 'desert

people' but rather 'love green places' and 'nature'. This dichotomous perception—of people who are either 'green lovers' or 'desert lovers'—was exclusive to this group, as was the perception of 'nature' as not including the desert and pertaining only to (more) vegetated natural areas. They also perceived the desert as 'boring', 'lonely' and at times 'dangerous' to a much larger extent than 'desert lovers'. Despite having this preexisting perception, participants claimed to generally enjoy the experience and often characterized it as slightly boring but still 'fun' (often using the specific word for 'fun' in Hebrew—'Kef'—to describe how they feel). A main 'mitigating factor' for them was the opportunity to socialize with friends and family and the opportunity to get away from the pressures and worries of everyday life, as well as more physical aspects such as the quietness of the desert, the clean air, the physical exercise, the pleasant breeze and feeling the warmth of the sun on one's skin.

3.4 | Social and cultural identity: Home, friends and belonging

In terms of identity, locals, both Jewish and Bedouin, tended to use the term 'home', but a few other participants, who had spent much time in the desert in previous years, also said that they felt like they were 'coming home'. The same group said that the landscape felt 'familiar', and four participants used the same anthropomorphizing notion regarding plants, claiming, as one of them puts it, that 'when I see plants that I know, it feels a little like friends that I get to see again'. The relatively common theme of feeling 'connected to the desert' can also indicate a relationship between identity and place. Locals (both Bedouin and Jewish), in contrast to tourists, tended to stray off the official (marked) trail. They also tended to smell and taste plants, touch objects such as rocks and even handle dry animal scat, more often than non-locals. One participant picked leaves off the bushes to taste them as he went along the trail and turned over rocks to see whether there were small animals hiding under them. Another demonstrated how he crushes the leaves of a bush to create a type of soap and proceeded to clean his hands with the excreted liquid.

Social benefits were mentioned mostly in terms of enjoying the company of friends and family in nature, although often with little or no relation to the specific landscape or ecosystem. Interestingly, these social benefits were more frequently emphasized by people who characterized themselves as 'not liking the desert'. One interviewee admitted: 'Let's say it this way: if it weren't for my friends, I wouldn't have come to the desert', while another stated that 'with all due respect, when I go home I won't remember the view, but I will remember the stories my friends told me'. She later added that while she found the landscape somewhat boring, it had provided a wonderful backdrop for that specific social gathering.

3.5 | Spiritual values: God, biblical landscapes and a new perspective

The desert has been noted by historians, anthropologists and theologists as a special location in terms of religious and spiritual activity as well as cultural significance for many people (see Lane, 1998 for a comprehensive analysis). However, in the current study, references to a specific deity or to prayer were relatively rare, and interestingly were not even made by the few religious participants. A more common reference was made to the 'wonders of creation', mostly in relation to intricate and remarkable biological and geological processes, as well as for the pleasing aesthetic attributes of the landscapes. However, these were not necessarily directly linked to a deity, but rather to 'creation', 'nature's forces', 'the universe' or 'the desert' (as a powerful force of nature). Biblical references appeared several times, particularly those that characterized the relatively undisturbed landscape as 'biblical' or reminiscent of biblical times. Such references may be particularly emphasized due to the significance of the location, considered the 'Holy Land' of three prominent monotheistic religions, with the desert having an important place in the narratives of these faiths.

If we broaden the definition of spiritual ES to mean anything that pertains to the perception of one's spirit or soul, or even to the notion of mindfulness, then it is possible that other services mentioned by participants can be relevant to this category. For instance, two strong themes were 'disconnecting from everyday life' and 'gaining new perspective'. These aspects of contemplation and gaining insight on the non-material aspects of life and the world might also be considered as spiritual services. As one interviewee put it: 'For a little while I come out of the 'me', the individual that sits in front of the computer'. Another said: 'I think [being in the desert] will just help me clear my head of everything, to connect to my…inside, to my heart. [...] I see myself emptying out all of the bad energy that I have and all the bad thoughts and just connect to…to my soul and feel this inner peace'.

3.6 | Recreation and tourism: Walking, social gathering and unusual experiences

All but two of the interviewees stressed their enjoyment from walking in the desert on the chosen path, and many related to walking in nature in general, or even just walking as an activity that made them feel good. However, the fact that the interviews were constructed in a way that included this activity—walking in a desert nature reserve—reference to this activity would not be indicative of any general trend. References to other recreational activities or to other types of tourism in the interviews were scarce.

One might argue that broader definitions of recreation and tourism ES could potentially include any positive experiences that would draw visitors to the desert and would thereby include most—if not all—of the other five CES categories listed above. If people have positive experiences in the desert, even if they are considered to have cultural, cognitive, emotional, physical or even spiritual value—they may be considered to underlie the recreational draw of the desert, and as such, be very relevant aspects of tourism.

3.7 | The holistic nature experience

The ability to gain insight to the authentic, complex, multi-layered holistic experience of participants was found to be another distinct

advantage of the walking-while-focusing methodology. The following observation by one of the participants is a good example for the type of complexity of the experience that can be elicited and understood using this method:

> [I'm enjoying] everything, the company, the weather, everything. […] I find it hard to zero in on one specific thing, but I think that the combination between this ravine, the blue sky and the temperature, and the fact that the trail is not too difficult […]. Right now, I can focus much more on this slalom that this ravine is creating, with the contrast of the blue sky, and I can address the beauty of this place, it's not something specific. I won't talk to you, not about this bush, parts of which I can see are blooming and the question is how, from what water? Because there is no water here. I mean there was, you can see by its color. But it's everything, the sum of it.

This is an example of the complex mixture of social, aesthetic (including shapes, colours and composition), cognitive (contemplation of natural processes and heightened awareness to details), physical (temperature) and recreation (enjoying physical activity) services experiences by one person, at one moment, all at once. It is also indicative of the complexity of this type of experience, and in that sense, resembles other accounts voiced by participants that included multiple levels or categories of CES simultaneously.

4 | DISCUSSION

> […] It seems to me that the strangeness and marvel of existence are emphasized here, in the desert, by the comparative sparsity of the flora and fauna. Life not crowded upon life as in other places, but scattered abroad in sparseness and simplicity, with a generous gift of space for every herb and bush and tree, each stem of grass, so that the living organism stands out bold and brave and vivid against the lifeless sun and barren rock.
>
> Edward Abbey, Desert Solitaire, pp. 30–31

We begin the last section, our conclusions, with a quote from the same book as that which appears in the beginning of this article (Abbey, 1968). This time, the author relates how the 'sparseness' and 'simplicity' of the desert lends more prominence to the objects it does host, living and non-living. In the current case study, findings indicate that the focusing interviews allowed participants to take advantage of this feature and better notice the cultural services provided by drylands—aesthetic, spiritual, social, cognitive, recreational, physical and mental—and how they interact and influence each other until it is difficult to tell where one ends and the other begins.

4.1 | Dryland CES: Diverse, integrated holistic interaction with the ecosystem

The six CES categories, as derived from multiple sources, provide a useful tool for thematic analysis and for organizing and listing the various CES that drylands can provide for people, as we did in the previous section. However, the analysis also indicated that many experiences, or at least their accounts, did not fit neatly into one category or another. While we previously acknowledged the potential relevance of other cultural services to the category of tourism and recreation, it is not the only case where the lines between CES categories can be blurry or where potential overlap may exist. Despite the initial effort to delineate them, we therefore suggest that these be perceived less as exclusive categories, and more as different emphases of the various aspects of CES.

Likewise, we found that the benefits provided by dryland ecosystems are derived from the holistic experience in nature, and only rarely from a particular biotic feature of the ecosystem. Furthermore, abiotic features of the environment (geology, climate) prove to be a significant source of CES, individually and through interaction with other landscape features. Interviews contained many references to geophysical aspects, but also to other properties such as temperature, the wind and the sun, the colour of the sky and the shape and even colour of the clouds. Other aspects may include the cleanliness of the air and the quiet of the desert—two of the strongest themes, alongside geodiversity, mentioned by interviewees as positive dryland CES (as shown in Figure 3).

Additionally, some biotic elements mentioned by interviewees, namely snakes, scorpions, onagers (wild asses) and camels, were not observed during the interview but were nonetheless mentioned as something they associate with the desert, recollect seeing in the past, or may be seen as a possible threat. However, these still have 'existence value', in that the mere knowledge or perception of the existence of such species in a certain environment (especially 'charismatic species') is part of the CES of specific environments. This is the case even if they fall under the category of 'nonuse values' that is even if stakeholders do not enjoy or experience them first hand (Fish et al., 2016; Hirons et al., 2016).

Including the abiotic components of environments in ES valuation is supported by several scholars and large-scale ES assessment initiatives such as CICES (2018) and UKNEA (2014). More specifically, the approach of landscape services (Termorshuizen & Opdam, 2009; Westerink et al., 2017), is closest to the one supported by the findings of the current study. It advocates seeing the landscape patterns and processes as the objects of service assessment, rather than the ecosystem or its biodiversity, which can provide additional layers of relevant information to the assessment of services provided by environments. This term can also, as the rationale behind landscape services terminology maintains, unify scientists of different disciplines, as well as stakeholders, planners and decision-makers, in creating an interdisciplinary knowledge base suitable for collaborative landscape planning and policy.

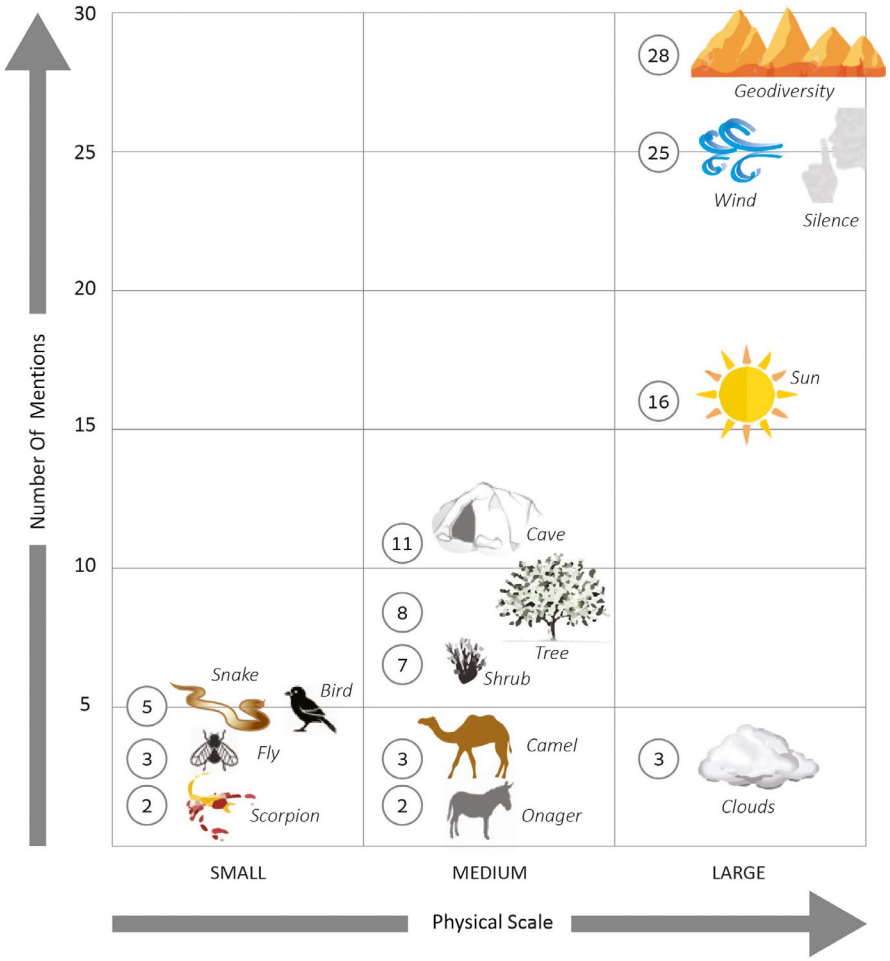

FIGURE 3 Number of mentions of particular CES themes for drylands relative to their spatial scale (number in the circle represents the total number of participants among the 30 respondents who mentioned this them)

4.2 | Disservices of drylands

While most participants reported having an overall pleasant experience, some mentioned less positive aspects of their interaction with the landscape. Most often, this came from those who characterized themselves as people who 'do not like the desert'. Although this was not a criterion for participant selection, self-defined desert-averse participants constituted a third of the interviewees, which provided additional insights as to dryland CES for different types of stakeholders or visitors. The group was characterized by themes such as seeing the desert as 'lifeless' and 'depressing'. A few even exclaimed that they do not like the desert because they like 'nature', essentially defining the desert as 'non-nature', as they only considered non-arid landscapes to be 'nature'.

Further insights can be gained by what this group did consider as services the desert provided for them: opportunities to spend quality time with friends and family, a place that enables them to enjoy the physical activity and challenge of walking, and a place where they can get away from the urban environment and the stress of everyday life. They did, however, often see geodiversity as aesthetically pleasing and interesting aspect of the landscape. Finally, while some desert-averse participants said they enjoyed the quiet and secluded nature of the desert, reported by 'desert enthusiasts' as a strong positive theme, others said it made them feel 'lonely' and 'bored', and that they would therefore not want to spend more than a day in this environment. Interestingly, desert enthusiasts mentioned almost no disservices, although some expressed concern for plants and animals due to the visible effects of the long drought (e.g. scarcity of green plants).

These insights can contribute to the understanding of desert CES, as they demonstrate the existence of (at least) two seemingly distinct groups that have different perceptions of these services. The same phenomena (quiet, remoteness, low plant life visibility) can be seen as positive by one person and negative by another. Protecting the natural authentic characteristics of dryland landscapes would thus be considered highly desirable by desert enthusiasts, while desert-averse visitors might prefer the trend of 'greening the desert', commonly implemented in the area (cf. Orenstein, Porat, & Tsalyuk, 2018).

4.3 | Walking-while-focusing: Methodological advantages

The novel methodology proposed here, of walking interviews combined with focusing, has proven to be uniquely suited for accessing information that pertains to holistic experiences of participants regarding the CES of drylands. This is noteworthy because while other qualitative and quantitative methodologies can and do often provide data regarding attitudes or opinions pertaining to separate aspects of the landscape,

the immediate, authentic and holistic experience, with its intricate and illusive nature, is more difficult to capture. The proposed method fills a noted conceptual and methodological gap in CES evaluation efforts declared in the theoretical literature on CES. Specifically, it can 'widen the extent of people, values and CES considered in ES evaluations' (Hirons et al., 2016:23) and connect 'environmental places and cultural practices that link together biophysical entities and processes with wider human well-being' (Fish et al., 2016:8).

Findings also indicate that focusing supported the existing benefits of walking interviews, such as making respondents more inclined to speak freely and openly about their experiences, encouraging place-based information and receiving rich data pertaining to sensory experiences. It also helped them stay focused on the 'here and now', which is particularly compatible with the place-specific data that can be obtained by walking interviews. The aspect of sensory experiences, impossible to replicate in other settings, is a particular strength of walking interviews, which are amplified by the emphasis that focusing puts on physical sensations. Additionally, the very act of walking and focusing seemed to increase the participants' affinity to desert ecosystems and augment the positive aspects of their nature experience. Future endeavours, academic or others, could therefore attempt to use this method not only as a tool to extract information from stakeholders but also as a way to connect people to nature.

While potentially useful for the assessment of all landscapes, natural and urban, the study also demonstrates particular effectiveness and suitability of focusing as an interview technique for dryland CES assessment. Several participants noted that they had noticed aspects of the landscape that they would not have noticed were they not prompted to focus. Interestingly, one interviewee said the following, without being familiar with the technique of 'focusing', and without any (explicit) reference to the interview methodology:

> I feel like when we walk in the desert it demands something extra from us. Let's say, if you look around, a lot of people might say to you "oh, it's boring, the same color, everything". But if you really look, you see so many shades and even in the vegetation [...] and I really love that connecting to the scenery demands my active participation [...] it requires some work on my part in order to connect to it. That it isn't handed to me like 'fast food' but that it requires some work on my part to create this connectedness.

Focusing in drylands invites participants to notice the details of what is, for some, a monotonous landscape, devoid of life, with biotic features that are difficult to distinguish from one another. It can therefore provide a meaningful and needed contribution to desert CES evaluation. For these and other landscapes and ecosystems, focusing can thus aid both scientists and the participants themselves to better understand the broader, holistic experience of their surroundings, including biotic and abiotic aspects of which they were not fully aware before. The variety and the highly individual nature of the data obtained by this methodology can therefore be used to understand entire experiences, as well as specific attitudes and preferences.

As the principles of focusing purposefully limit the content originating from the listener/interviewer, it arguably also has the potential to produce purer (i.e. more authentic) information in this context. We suggest that due to the richness and depth of the data obtained through this method, it would also be useful as a highly qualitative, preliminary step to determining what types of cultural ecosystem services are most relevant for assessment—services that may otherwise go unnoticed by traditional methods of evaluation. This leads us to another scientific opportunity provided by this method, using a mixed-methods approach: walking-focusing interviews could be the basis of hypothesis building, with these hypotheses later tested by quantitative tools (e.g. surveys).

Walking-focusing interviews can provide insights that can also be used for other applications, such as planning, policy or management. If we take the example of sound, noting that quiet or lack of urban noise are a strong theme in terms of their importance to visitors' experience, then tourism and spatial planners could include this consideration when they think of building or paving a road next to a nature reserve—even if these do not enter the nature reserve itself. Eco-tourism in the area can be marketed in a way that addresses the quiet of the desert as a significant advantage, with tourism and marketing focusing on getting away from the noise, as well as other stressful elements, of urban life. In terms of policy, park management could limit car entrance and parking to an area that has minimal influence on the natural soundscape and limit certain activities (e.g. playing music) inside the park.

4.4 | Limitations and future research

It should be acknowledged that the walking-while-focusing interview methodology is inherently demanding in terms of resources of time, money and complexity, in comparison to other methodologies. This is true not only for the interviews themselves but also for the recruitment and analysis phases as well. This limits the number of interviews performed and factored into the analysis, although the sample size is well within range of most (in depth) interview-based studies. Participant recruiting opportunities are also limited due to the need for participants to dedicate several hours of their day to the research. Although the interviews themselves are 15–25 min, the entire walk took upwards of 2 hours, with non-locals having to devote the entire day to it due to travel time and distance.

Additionally, interviewers purposefully limited the number of background questions so as not to influence the participants' experience too much, including only questions of age, place of birth and place of residence. However, it might be possible, in future studies, to include more background questions after the interview is completed, especially if the sample size is larger and correlation between background data and nature experiences or preferences can be tested. It could also be advantageous to test this methodology in other types of ecosystems or landscapes, as well as interviewing people from different cultures and backgrounds, and who speak

different languages. Another aspect to examine would be the differences and similarities in themes if the method were implemented in more urban and less urban (more 'natural') areas, or whether there might be similar or other benefits when the method is applied in other natural landscapes.

CONFLICT OF INTEREST

Nothing to declare.

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AUTHORS' CONTRIBUTIONS

The authors collaborated on, and contributed equally to, research design and protocol development. Y.T-S. conducted the field research and analysed the data. She was also the primary writer of the manuscript. D.O. developed the conceptual framework for cultural ecosystem service assessment, procured funding and assisted in data analysis and writing. Both authors assume accountability for the accuracy and integrity of the research.

DATA AVAILABILITY

Redacted and anonymized transcripts of the 30 walking interviews used in this research are publicly available on Zenodo https://doi.org/10.5281/zenodo.2558218 (Teff-Seker & Orenstein, 2019).

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ENDNOTES

[1] While the terms 'deserts', 'arid environments' and 'drylands' may at times have different connotations and nuances, for the purposes of this paper they will be treated as synonymous; we adhere to the technical definition provided in the U.N. Convention to Combat Desertification, that is, lands where annual precipitation is less than two-thirds of potential evapotranspiration (MA, 2005:29).

[2] They rely on Gibson's theory of affordances (1979), which assumes that the value of an object and its possibilities for action depend on how different subjects perceive it and the potential interactions it holds for them (e.g. a rock would be perceived as a potential hiding place by a gecko but a potential weapon by a human).

[3] In a comprehensive meta-analysis of qualitative sample sizes in social studies by Sim and colleagues (2018), the authors note that recommended, as well as actual, sample size varies widely between qualitative studies. They note recommendations of anywhere between 4 and 30 cases per case-study and 5 to 35 for grounded theory studies. Many researchers object to a pre-determined sample-size, with 'informational redundancy' being the rule of thumb for determining sample size posteriori, so that researchers can cease adding participants when they feel that they have reached informational saturation.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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