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(Re)thinking (re)connection: Young people, “natures” and the water–energy–food nexus in São Paulo State, Brazil

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This paper critically analyses pervasive contemporary discourses that call for children and young people to be “reconnected” with nature and natural resources. Simultaneously, it reflects on emerging forms of nexus thinking and policy that seek to identify and govern connections between diverse sectors, and especially water, energy and food. Both of these fields of scholarship are concerned with connections, of different kinds, and at different spatial scales. Based on a large-scale, mixed-method research project in São Paulo State, Brazil, this paper explores how these rather different literatures could be combined in order to (re)think notions of (re)connection that operate across different spatial, political and material registers. Through research with Brazilian professionals and young people about their experiences of, and learning about, the water–energy–food nexus, the paper makes several substantive contributions to scholarship on childhood, youth, environmental education and nexus thinking. Centrally, it is argued that, rather than dispense with them, there are manifold possibilities for expanding and complicating notions of (re)connection, which rely on a more nuanced analysis of the logistical, technical, social and political contexts in which nexuses are constituted. Thus, our work flips dominant forms of nexus thinking by privileging a “bottom-up” analysis of (especially) young people's everyday, embodied engagements with water, food and energy. Our resultant findings indicated that young people are “connected” with natures and with the water–energy–food nexus, in both fairly conventional ways and in ways that significantly extend beyond contemporary discourses about childhoods–natures (and particularly in articulating the importance of care and community). Consequently, the nexus approach that is advocated in this paper could enable more nuanced, politically aware conceptualisations of (re)connection, both within and beyond scholarship on childhoods–natures and nexus thinking.

KEYWORDS

care, children's geographies, environmental education, nature, politics, youth geographies

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1 | INTRODUCTION

From the early–mid-20th century, scholars from several disciplines, as well as a range of popular commentators, have argued that children and young people's engagements with “nature” – notably in terms of play in “natural” environments, or awareness of sources of water, energy or food – have steadily diminished. Fitting more broadly into discourses about society/nature dualities in general, and discourses about disconnection within food/agriculture more specifically, concerns with children's (dis)connectedness with such “natures,” and attendant issues like children's independent mobilities in outdoor spaces, have been longstanding and major foci for interdisciplinary (and especially geographical) studies of childhood and youth (Barker et al., 2009; Freeman & Tranter, 2011; Taylor, 2013; Witten et al., 2013). Moreover, there exist widespread, formidable and apparently incontrovertible claims that children and young people's disconnections from nature are at the root of many societal and environmental ills – from obesity to manifold psychological conditions, and from social exclusion to ill-preparedness for Anthropocenic environmental change (Louv, 2008; for an overview, see Chawla, 2016). Consequently, children and young people are (usually through educational interventions) overwhelmingly targeted and responsabilised as key agents for positive change – if only they could somehow be “better connected” with nature (Horton et al., 2015).

Alongside debates about childhoods–natures, geographers and others have held a longstanding interest in theorising and investigating “connectedness” of various different kinds. Indeed, there has been a proliferation of work that has developed Actor-Network, complexity, assemblage, new-materialist and other forms of relational thinking (e.g., Ash & Simpson, 2016; Müller & Schurr, 2016). An important, recent strand of this scholarship has concerned the potential value of “nexus” thinking for understanding complex, mutual and interdependent systems, and inter-connections between resource sectors, such as water, energy and food (WEF) that had previously been investigated separately (Leck et al., 2015; Schwanen, 2018). Nexus thinking has gained considerable traction in academic, policy and practitioner circles, including of late within Geography – especially in “development” contexts, wherein approaches predicated on integrated resource management, metabolic flows and governmental regimes have repeatedly been posited as critical to the accomplishment of multiple Sustainable Development Goals (SDGs) (Cairns & Krzywoszynska, 2016; Keairns et al., 2016; Weitz et al., 2014). Therefore, much in the same vein as scholarship on childhoods–natures, nexus approaches have underlined the importance of identifying, making, supporting and (at times) critically interrogating “connections” – albeit often of different registers, scales and politics from those with which childhood and youth scholars have been concerned.

However, it is our conviction that there could be much to be gained – conceptually, politically, pragmatically – from bringing together these usually divergent fields of inquiry. This paper demonstrates how cross-pollination of approaches from interdisciplinary childhood and nexus studies could challenge and extend the ways in which “connections” are understood, particularly in the face of pressing social and environmental challenges. In this light, and based on a large-scale, interdisciplinary research project that sought to investigate young Brazilians' experiences of, and learning about, the WEF nexus, this paper makes a number of inter-related contributions to geographical and interdisciplinary research.

First, in bringing together contemporary debates about childhoods–natures with nexus thinking, the paper offers a number of potential avenues for (re)theorising connection. In particular, it shifts the terms of the debate in childhood studies away from normative readings of (often micro-geographical) play, learning and encounters with/in “natural” spaces to an apprehension of relationality informed by young people's own, everyday, material accounts of connection, as they are entangled with questions of care and social equality across spatial scales. Second, the paper seeks to acknowledge both the rhetorics that support the argument that children and young people should (re)connect with nature, and those scholars who have sought to question the terms of predominant discourses about childhoods–natures, largely through feminist and new-materialist philosophies (e.g., Änggård, 2016; Taylor, 2013). Thus, although sympathetic to these more recent critiques, we do not dispense altogether with the term “connection”; rather, we open out a range of perhaps alternative, perhaps complementary forms of connection that emerge when the lens is turned to young people's engagements with the WEF nexus instead of the normative construct of “nature.”

Third, the paper makes substantive, original, empirical contributions, which, importantly, emerge from the specific geographical context in which the project took place: in north-eastern São Paulo State, Brazil. In terms of nexus research, it is one of the first systematic studies to directly respond to calls for both a more detailed conceptual development of the term “nexus” (and its attendant focus on “connection”) and for “bottom-up” research with key stakeholders, and especially of people's engagements with water, energy and food in non-professional, everyday and/or domestic settings (Allouche et al., 2014; Leck et al., 2015; Schwanen, 2018). Our focus on young people is significant because of the almost complete absence of youth (and, indeed, other markers of social difference) in most nexus research to date. Yet, given the predominance of rhetoric about (re)connecting children with nature, and the generational role of children in addressing the very

same environmental issues as do nexus advocates, it appears to us to be vital to connect these two fields of scholarship and practice. For instance, despite their common goals, scholarship on environmental education and nexus regulation/governance remains ostensibly separate, with little effort to consider how these two areas of research and practice might be connected. Specifically, when cast alongside views of relevant professionals, we suggest that young people's careful, critical and politicised narratives of WEF provide an opening to consider childhoods–natures beyond the limited normative understandings of “connection” which are so commonly reproduced in existing accounts of childhood and “nature.”

The next section provides a critical review of scholarship on children, young people and nature, and on nexus thinking. Subsequently, the methodology and context for the Brazilian study are outlined. Thereafter, the paper analyses professionals' and young people's narratives of the WEF nexus. Remaining mindful to neither reify nor stabilise “the nexus,” our analyses demonstrate multiple forms of connection that are differentially timed and scaled. In particular, we highlight a tension between the narratives of (dis)connection inherent in professionals' strategic interventions in the water–energy–food nexus and young people's own accounts of connection.

2 | (RE)THINKING (RE)CONNECTION: CHILDHOODS–NATURES AND NEXUS THINKING

2.1 | Childhoods–natures

The association between childhood, youth and nature (henceforth “childhoods–natures”) is centuries old. It extends back at least as far as Rousseau and the entanglement of biological and social processes in both Western imaginaries about, and pedagogical interventions for, children (Ryan, 2014; Valentine, 1996). This association has provided one of the most fruitful avenues for research about children and young people – in Geography, the wider social sciences and beyond, in the psychological, medical and biological sciences. In order to afford some context for our later arguments, we provide here an overview of some of the key premises of this work, which focus on the significance of *connectedness* between childhoods and natures. We are acutely aware both of the very different ways in which social scientists and others theorise “childhoods” and “natures” (Taylor, 2013), and of the divergent ways in which those terms are deployed in that work (not least given that the present paper deals with older young people).

The guiding assumption for the majority of research about childhoods–natures is that connection with nature is a perceived “good” for humans, but especially for children. Nature is usually figured dualistically with society, although the relative worth of purportedly “wild” spaces vis-à-vis patchwork urban natures (for instance) is contested. This supposition has supported a range of popular and academic claims about the importance of children's connections with nature – whether in terms of physical, embodied learning, play or presence in forests or other natural spaces, or children's understanding of natural processes (especially the production, management and divestment of resources like water, energy and food). Thus, a range of studies and systematic reviews have demonstrated the positive outcomes for children and young people of better connectedness with nature in terms of: improved self-esteem, behaviour, creativity and empathy (Faber Taylor & Kuo, 2006); diverse developmental characteristics and performance in standardised educational tests (Armour & Sandford, 2013; Austin et al., 2016); the adoption of pre-environmental knowledges and behaviours (sometimes termed “biophilia”; Fägerstam, 2012; Payne, 2014); participation and social inclusion in “local” communities (Wake & Birdsall, 2016); varied health outcomes, ranging from reduced prevalence of obesity (Durand et al., 2011) to improved cell ageing profiles (Olafsdottir et al., 2016) and from improved mental health (Biddle & Asare, 2011) to lower allergy rates (Chawla, 2015).

A second assumption for much work on childhoods–natures is that children's and young people's connections with nature have diminished since around the early–mid-20th century, at least in several countries of the Minority Global North. The reasons for this are manifold and well-rehearsed – from a decline in children's outdoor mobilities (Witten et al., 2013) to parental fears about children in urban spaces (Pain, 2006) to concerns about contemporary consumption trends and technologies (Austin et al., 2016). Almost universally, such forms of disconnection are considered to be negative – both because they compromise the positive effects of nature cited above, and because they introduce a range of negative effects (and affects), including biophobia, negative mental and physical health outcomes, and various forms of social exclusion (Louv's (2008) “nature-deficit disorder” being perhaps the best-known exposition of this argument).

This assumption of increasing degrees of *disconnection* has led to the development of whole industries – academic, practitioner and media – around the steps that might be taken to (re)connect children and young people with nature. As Louv (2011, p. 3; emphasis added) has it, these rest on the promise of “a *reunion* of humans with the rest of nature”; on “[a] range of interventions that have been designed to address ‘*connectedness*’ to the outdoors” (Austin et al., 2016, p. 121; emphasis added); and, therefore, on the centrality of discourses and practices of (re)connection in remedying a vast array of

perceived ills (Malone, 2016). For many decades, various forms of environmental education have been charged with addressing these perceived forms of disconnection, as well as with resolving still-wider concerns about global environmental change (Corner et al., 2015; Percy-Smith & Burns, 2013; Walker, 2017). Notably, environmental educators valorise connections of various kinds: embodied engagements with/in natural spaces (Stratford et al., 2016), which are ideally local and thus foster social connections and inclusion (Morgan, 2009); the connectedness of local and immediate experiences with global and more longstanding issues (Nygren, 1999); and the increasing logic of a “deficit” model that bestows educational spaces with therapeutic-restorative properties (Kraftl, 2013a, 2016).

Despite their pervasiveness, critical scholars have increasingly questioned the above assumptions. One of the most longstanding concerns has been with the evidential bases for claims made about the efficacy of “connecting” children with nature (Faber Taylor & Kuo, 2006). Relatedly, geographers have critiqued the overly emotional nature of debates about childhoods–natures, the privileging of “local” forms of connection, which efface more outward-looking ethics of place (Joassart-Marcelli & Bosco, 2015), and underlying (normative) assumptions about bodily size, food technology and play (e.g., Punch et al., 2010). Simultaneously, geographers have been at the forefront of attempts to unpick normative discourses of childhoods–natures – whether through critiques of rural or wilderness imaginaries associated with children (Jones, 2000), of the biopoliticisation of children's “natures” through the psy-disciplines (Kraftl, 2015), or through new-materialist scholarship that has, increasingly, sought to witness the multiple, dynamic ways in which childhoods and non-human natures are co-constituted, co-mingling, intra-active (Kraftl, 2013b; Taylor et al., 2013). Resonating with wider work on natures in Geography (e.g., Hincliffe, 2007), these accounts critique the particular, circumscribed, value-laden – and predominantly Eurocentric – constructs of nature which are often uncritically reified in normative discourses of childhoods–natures (Horton & Kraftl, 2017, 2018).

We do not wish to institute a false opposition between scholarship on childhoods–natures that privileges “connection” and the above critiques – it is not necessarily the case that new materialists refute the possible benefits of children learning outdoors. Meanwhile, we want in this paper to steer a careful path through these lively debates – neither dismissing any “side,” nor necessarily attempting to synthesise some fairly stark differences. Rather, our intention is to shift the terms of the debate: through bringing together childhoods–natures thinking and nexus thinking; through a focus on “WEF” (rather than play, learning or straightforward “being-with” nature); and, through a focus on older children and young people, in Brazil. As such, this paper resonates with established work on young people's access to and learning about natural resources in Majority Global South contexts (e.g., Katz, 2004; Sugden & Punch, 2016). However, we note that there are no systematic studies on either children or young people's “connections” with nature or their entanglements with resource nexuses such as WEF. Moreover, surprisingly, given the country's size, few children's geographers have published research on Brazil, and the work that does exist predominantly focuses on urban street children (e.g., Gough & Franch, 2005; Ursin, 2011) or their environmental knowledge (e.g., Pedrini et al., 2010; Reigada & Reis, 2004).

2.2 | Nexus thinking: (re)connecting the nexus?

Compared with research on childhoods–natures, scholarly interest in nexus approaches – and especially resource nexuses – is more nascent and, as Schwanen (2018) argues, rather ambiguous in terms of its theorisation. Recently, however, through a flurry of international conferences, national and global policy documents, funding prerogatives and academic publications, there has been burgeoning interest in resource nexuses – and especially the WEF nexus. Current interest in the WEF nexus is predicated on concerns about resource scarcities and interdependence, particularly in the Majority Global South. “[A] nexus is defined as one or more connections linking two or more things” (Leck et al., 2015; emphasis added); (re)connection – whether processual, conceptual or discursive therefore sits at the heart of approaches to resource nexuses. Indeed, as Leck et al. (2015) identify, (re)connection does not only imply greater attention to the mutual dependencies, flows and resource sectors that had hitherto been scrutinised separately. Rather, it recognises the need to (re)connect academic disciplines and institutional actors through inter- or trans-disciplinary working (see also Harris & Lyon, 2014; Stirling, 2014). It is argued that only through these kinds of (re)connection can more integrated forms of resource management and governance be fostered.

While one could argue that other approaches – perhaps predicated on assemblages, Actor-Networks, affects or materialisms – allow deeper, more nuanced ways of connection-thinking, recent turns to nexus thinking are important in two senses. First, the nexus is already a widely used term among diverse, multidisciplinary scholars, scientists, engineers and practitioners, and therefore provides a ready-made point of articulation for transdisciplinary conversations on inter-sectoral connectivities. Second, the concept currently has far greater international traction – especially in policy arenas – than many concepts that animate much geographical scholarship.

Although still fairly nascent, the majority of research on resource nexuses focuses on WEF. In turn, that research is dominated by top-down, large-scale perspectives focusing either on engineering/systems approaches that monitor or model flows of resources through discrete systems, or on governmental/policy regimes that might better enable integrated resource management in any given context (Bazilian et al., 2011; Schwanen, 2018). In terms of the former, several recent studies have used value-chain analyses (White et al., 2017) or indicators of resource use across sectors (Vilanova & Balestieri, 2015). These analyses account for resource bottlenecks, hidden flows and environmental impacts that might help resolve “trade-offs” between different parts of any given nexus and which, in turn, might inform regional economic development policies (White et al., 2017). In terms of the latter, several recent studies have focused on nexus regulation (Larcom & van Gevelt, 2017) and governance (Weitz et al., 2017), with efforts to evaluate critically whether and how the nexus as a contemporary “buzzword” privileges integrated, technocratic forms of environmental policy making (Cairns & Krzywoszynska, 2016).

As this latter observation implies, nexus thinking has been received with varying degrees of enthusiasm. Several commentators have questioned the novelty of nexus thinking in relation to more longstanding approaches to integrated resource management (Keairns et al., 2016), while questioning why WEF are privileged, to the detriment of other sectors such as land, environment or health (Ringler et al., 2013). Elsewhere, it has been observed that, despite efforts to analyse WEF in an integrated way, particular sectors – especially water – somehow become placed “centrally” within nexus systems (Leck et al., 2015). Moreover, most studies take a “top-down” approach, mapping resource flows at regional or city levels – for instance in the service of an “urban metabolisms” approach to understanding the flows of WEF into, through and out of (large) cities (e.g., Heynen, 2014). Indeed, in a review of methodologies for analysing WEF nexuses, Endo et al. (2015) schematise “qualitative” and “quantitative” approaches – but in terms of the former, cite just a few studies, which in turn actually rely almost exclusively on fairly large-scale questionnaire surveys with often high-level policy makers. In response, and while (like us) acknowledging the fairly nascent and in some cases ambiguous nature of nexus scholarship, Schwanen (2018) argues that geographers could and should have a key role to play, in several senses: in questioning the global scale of much nexus policy making and abstraction; in articulating the place-specific and multi-scalar manifestations of nexuses; in challenging the presumed dominance of the water–energy–food triad (and thus admitting other constituents, such as land or chemicals); and in slowing down abstract forms of nexus thinking that are largely based on mathematical models. As Leck et al. (2015) argue, nexus scholarship currently lacks a solid research base, with a particular need to explore local, everyday, practical manifestations of the nexus (also Allouche et al., 2014; Biggs et al., 2015). Finally, Walker and Coles (forthcoming) argue for a more politicised conceptualisation of the nexus that recognises “flows that *matter*” – how certain nexuses or processes therein generate and are generative of interdependencies that entail particular kinds of responsibility, power relations or governance.

This paper makes a significant contribution to nexus literatures by responding to these critiques and taking up Schwanen’s (2018) challenge to geographers. Again, like Schwanen, we do not simply seek to “apply” nexus thinking to geographical research, or claim that nexus thinking will usher in some of kind paradigmatic shift in the discipline. Rather, while challenging definitions and theorisations of the nexus – and, as we will show, the assumed primacy of water–energy–food – we articulate place-specific and multi-scalar manifestations of the WEF (and more) nexus in Brazil. Furthermore, we do so by reading nexus thinking alongside social-constructivist and new materialist literatures on children’s voice and childhoods–natures, demonstrating the particular value of focusing on *young people’s* embodied, material experiences and (often overtly politicised) views in doing so. Our guiding contention for this paper – and the project on which it is based – is that there is also a need to understand how the WEF nexus(es) is/are embodied and expressed “bottom-up,” through the everyday lives of people who are not only “producers” or “decision makers” but also “consumers.” Critically, we do not assume that young people are simply “consumers,” but, in different ways, in different social-geographical contexts and at different ages, that they adopt diverse roles, which are entangled with those of more formally designated “producers” or “regulators” (McFarlane, 2013). As will become evident, the paper deliberately juxtaposes research with young people with in-depth interviews with a range of policy makers, educators and business actors in Brazil, in order to tease out a greater range of possible (re)connections with, in and beyond the “WEF nexus.”

3 | METHODOLOGY AND CASE-STUDY CONTEXT

This paper is based on a large-scale, interdisciplinary research project, involving geographers, educational researchers and engineers from various backgrounds (water, energy, production and civil engineering). It aimed to examine young people’s (aged 10–24) experiences of and learning about the WEF nexus in Brazil. The project focused on young people in Brazil for a number of inter-related reasons. First, like many countries in the Majority Global South, Brazil has a youthful

population, with approximately 37.1% aged 0–24 (Instituto Brasileiro de Geografia e Estatística, 2011). Second, despite significant economic and social progress in Brazil between 2003 and 2014, there remain stark disparities where, for over a decade, young people have been twice as likely as adults to be living in poverty. Third, Brazil has been undergoing a well-documented political and economic crisis, following a series of governmental scandals, which have sharpened debates about social and environmental justice, especially among the young (as is evident from our analyses below). Fourth, notwithstanding this recent political-economic context, nexus discourses have increasingly entered the policy arena in efforts to address multiple SDGs. Significantly, Brazil occupies a primary position as a food and energy producer for global markets (Hoekstra & Hung, 2005), and is an early adopter and world leader in biofuel innovations, placing lands and resources dedicated to domestic production under multiple, competing pressures (Ferreira et al., 2013).

For this study, the project team chose to focus outside the metropolises of São Paulo and Rio de Janeiro, given the predominance of research in those two cities, and given the focus in much nexus literature on large city-regions. Hence, our research focused on the Metropolitan Region of Paraíba do Sul River Basin and São Paulo State North Shore, in north-eastern São Paulo State. The region holds the following, important characteristics: (1) a population of 2.5 million (5.2% of São Paulo State's population); (2) a strategic location between Brazil's most important metropolitan areas (São Paulo and Rio de Janeiro); and (3) social, geographical and economic diversity (from urbanised cities with richer and poorer populations, to traditional rural communities in the coastal area, plus important environmental protection areas).

The project employed a mixed-methods approach. This paper reports on data from two of the four methods deployed (the others being a large-scale survey and a global video competition). First, we undertook a programme of in-depth, qualitative research with 48 diverse young people from the case-study region, developing an innovative “nexus approach” to working with young people. Interviewees were recruited from across Brazil's social spectrum, and from diverse geographical areas, including urban, rural, agricultural coastal, mountain and mixed communities. Each young person participated in up to four activities (numbers in brackets show how many participated in each): an initial, contextual, semi-structured interview about “my life with WEF” (48); a smartphone “app-based” activity, using a bespoke project app, which allowed participants to take photos and answer short surveys on usage of, and experiences with, WEF (38); a first follow-up interview (“WEF mobility mapping”), based on app outputs, and using Google Maps, where participants created maps tracking their everyday routines and mobilities around WEF (32); and a follow-up interview (“visual web exercise”), in which participants created visual representations of “their” nexus on a paper board by drawing (dis)connections with WEF (36). In total, the team completed 126 interviews, lasting between one and three hours each.

Second, we undertook semi-structured interviews with 64 key professionals who worked within the case-study region, or whose work incorporated some operational/strategic responsibility therein, even if their remit extended beyond the region. Interviews were conducted face-to-face, or via telephone, Skype or email, lasting between 30 and 165 minutes. Participants included representatives from diverse organisations whose work dealt with some aspect of WEF. For ethical reasons, we cannot name individuals or organisations, but the following sectors were represented: municipal, state and federal-level government actors; government, academic and independent research agencies; environmental and consumer rights NGOs; energy and water distribution companies (both private and state–private partnerships); family and small-scale commercial WEF producers; multi-stakeholder community organisations; and environmental education practitioners. Interviews covered various themes: their definitions of WEF and connections between them; production, use of and trade-offs between WEF; the organisation of their sector and key cross-sectoral/cross-scalar alliances; sustainability and efforts to minimise wastage; responsibility for social and environmental justice; and the role and significance of young people and education in achieving more sustainable societal practices.

Data from these methods are discussed in the two following thematic sections. First, we explore discourses of (dis)connection in interviews with key professionals in the WEF. We note that their narratives often prioritised logistical connections within/between urban spaces and between city and countryside, but that these narratives framed their views on young people's (dis)connections with nature. Second, we highlight young people's narratives of WEF and show how – contrary to prevailing discourses of disconnection, including those of key professionals – their discussions were always-already based on a strong, vividly narrated sense of connectedness. Moreover, we note that young people provided accounts of connectedness to WEF that were markedly politicised in their emphasis on care, social justice and community co/interdependence.

4 | UNDERSTANDING CONNECTION THROUGH THE WEF NEXUS

The notion of a WEF nexus was articulated in some specific, recurring ways in interviews with key professionals working in WEF sectors. In all research interactions, we did not assume knowledge of the nexus, its terminologies or dispositions. Most interviewees were familiar with the concept, but simultaneously expressed frustration with nexus terminology, given

its assumed status as a “European” or “western” construct. Participants were thus concerned to both articulate WEF connections within their operations but also to critique the awkwardness of “the nexus” as a concept for Brazilian practitioners:

We live in a connected world not only for depending from one another as society, but effectively in terms of planet resources. In time, I have already had the opportunity to get to know these questions of the nexus ... [as] it is known, essentially in the north of Europe. Here in Brazil, ‘the nexus’ is neither much spoken about, and nor is the connection among these three elements. (Energy Company Sustainability Manager)

Scott et al. (2015) remind us that the terminology was first used in 1983 at the Food–Energy Nexus Programme of the United Nations University and in the same era applied to work in India on electricity/power/water resource negotiations (Scott et al., 2015). The nexus concept has thus filtered into national planning and policy in diverse globalised contexts, and thus into the working vocabularies of many interviewees. However, as in the preceding quotation, discussions of “the nexus” were ironically framed in terms of the *lack* of connection between this (northern European) construct and the lived realities of Brazilian practitioners or communities – a point to which we return when discussing young people’s experiences later in the paper.

Despite the language of “the nexus” not being favoured by participants, many spoke of interconnections at various spatial scales, in terms of plural flows of materials and ideas. All participants described spaces where objects, people, natures and things would interconnect in their work. These sites of connection were typically deployed as part of a particular spatial imaginary of interconnections between urbanity and rurality and/or between discrete urban spheres. For example, interviewees often talked at length about inextricable links between São Paulo and surrounding farmlands:

[São Paulo city’s] capacity to support itself reached its limit at least 30, 40 years ago. The city in itself doesn’t have sufficient resources ... energy comes from thousands of kilometres away, water comes from 100, 150 km away, the great majority of food – real food, not that packaged rubbish they sell in the supermarket – comes from the green belt around the city [...]. So we have food, but we need water and energy, which aren’t available here. So we’re not self-sufficient. (Environmental NGO professional)

This understanding of the connectedness of urban and rural spaces in the production and consumption of WEF was widely reproduced (see also Domingos et al., 2014). The apprehension of urban WEF sectors as always-connected to, and co-dependent with, regional rural geographies was neatly represented in Figure 1: a poster displayed in the headquarters of a São Paulo-based NGO where we interviewed two members of staff depicting how “if the field does not plant, the city does not dine.”

Most key professional interviewees particularly emphasised the technical and logistical challenges of establishing and maintaining connectedness within their operations in relation to WEF. These connections required the maintenance of complex combinations of vehicles, highways, infrastructure, utilities and workforces. For example, the following quotation describes the technical and collaborative accomplishment of growing produce in urban spaces:

There are some very tall transmission lines on roads of cities we work at and below these lines nothing may be built because the lines are dangerous, but you may have some low plantations up to a certain height, so it is allowed to plant ... we have created a partnership with a social organisation called *A Cidade sem Fome* (The city with no hunger), and then they ... utilis[e] this space ... the community takes care of these gardens. (Public Relations Lead for Energy Company)

Interviewees also described the complex interconnectedness of processes, elements, commodities and values which constitute their work, as in the following quotation on interconnections between food commodity pricing, weather patterns, seasons and regional geographies of production:

It goes up a lot. Groceries prices go up, what you use for salad, which are produced more locally, but the large beef production, grains, they are not done in the same region ... if it stops raining there, beef and soya bean prices will go up. (Technical Advisor for National Business Support Network)

Overall, our interviewees afforded a broad sense of the multiple forms and scales of (inter)connection that characterised their work. Yet, critically, in doing so, they also framed how notions of (re)connection that have



FIGURE 1 If the field does not plant, the city does not dine.

characterised (predominantly Minority World) concerns with childhoods–natures have emerged in the Brazilian context. For instance:

We have a project where we are helping to set up nurseries [of trees] in schools and so the young people can see the plants growing, but [...] you know, the trees don't grow overnight, so by taking these objects into the school space we can draw out *connections* and that this generates a sense of *empathy* amongst the young people – what ways, by consuming natural resources, do I contribute to there being less green spaces, [...], how would I survive? (Environmental educator, São Paulo, emphases added)

However, a key concern raised by a number of participants was the sense that a culture of individualisation was eroding young people's capacities to see the kinds of wider interdependencies that they had signalled and, thus, to understand the nexus and its interconnectedness. The quote below explains that a culture of corruption has perpetuated an individualised society where the nexus becomes difficult for young people to understand:

Individualisation is sustained by a culture of corruption. This idea that you get what you can for yourself and don't worry about the rest of society ... there's no connection made between people's problems. So it becomes very difficult for young people to understand this nexus between food, water and energy, and how these three things can be connected in a sustainable way. (Water basin committee secretary, Paraíba Valley)

In sum, nexus thinking enabled us to witness multiple forms of interdependencies in key professionals' work. Nexuses were materialised through governments, NGOs and civil society partnerships, and were witnessed in threats to ecological systems on which human life depends. But – in line with our aim to bring together nexus thinking with scholarship on childhoods–natures – we have seen how key professionals saw young people as growing up in an individualised culture, lacking both “connections” and “empathy,” which in turn eroded their capacities to see the kinds of wider interdependencies with which they work. Our argument thus far is that straightforward calls to “reconnect” children with nature need, in turn, to be articulated with/in the pressing political, economic and ecological circumstances in which natures are constructed, rather than in isolation from them. In other words, children and young people's (dis)connections with “nature” are framed, articulated and

cross-cut by, and co-constitute, these circumstances. In what follows, however, we demonstrate that young people are indeed well aware of some of these interdependencies, and in turn critique the idea that cultures of individualisation are compromising these kinds of awareness. Thus, through the lens of the nexus, we complexify overly simplistic arguments for “reconnection” that are so often made about childhoods–natures.

5 | YOUNG PEOPLE, CONNECTEDNESS AND WEF

Drawing on our “nexus approach,” on new materialist approaches to the materialities of childhood and youth, and on more conventional understandings of children and young people’s political agency (e.g., Jeffrey, 2012), in this section we highlight the need to understand connections between different elements of the nexus as they are embodied in young people’s lives. Strikingly, interviews with young people were characterised by narratives of connectedness, but, echoing key professionals’ views, were framed by the particularities of the (in turn diverse) Brazilian context. Contrary to prevailing discourses of young people’s disconnection from nature and water–energy–food, interviewees vividly evoked connections between young people and diverse natures, in several senses.

First, young people invariably began from a strong sense of connectedness with, and rootedness within, their communities and regions – notably, cutting across spatial scales beyond the local (compare Ansell, 2009). For example, Figure 2 shows a Google Map image created by one of our participants (David).¹ Using this map, David visualised his everyday use and experiences of WEF, showing the spatialities of production and consumption, from the outskirts of Sao Paulo (over 150 km away) to rural locations of food production. He was asked to track the “journey” of water (color-coded in blue), energy (yellow) and food (green) onto the map, from the sources and locations of production, to the spaces of his everyday interactions with these resources, to the very end of their journey, whether into waste or recycling. The map shows that the spatialities of David’s experiences of WEF encompass different scales and environments, connecting the spaces of his local community in Taubaté with the metropolitan area of São Paulo, through urban and rural environments. When read alongside key professionals’ conceptualisation of the technical and logistical workings of the nexus (see previous section), David’s map affords a sense of his awareness of how the overlapping nexus flows operate.

Second, and despite the more-than-local sensibility displayed by some young people, many of their narratives of WEF were characterised by intimate connections within community, domestic and familial spaces. For example, Figure 3 shows

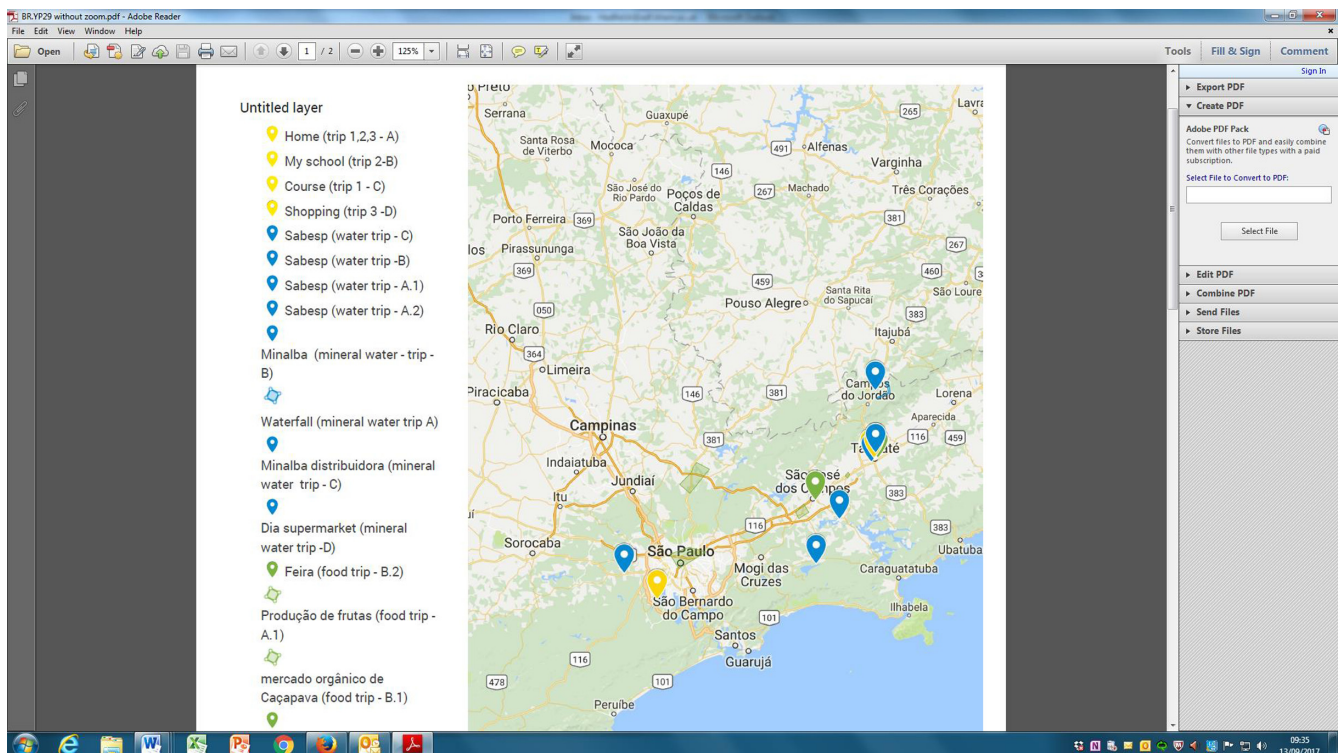


FIGURE 2 Mapping the nexus (David, Male, 16).

Isabelle's visual representation of the nexus, revealing the diverse spaces in which interaction with WEF happens. During this exercise, young participants were prompted to elaborate “their” personal, everyday nexuses – which encompassed WEF but also, crucially, much else besides. As Figure 3 shows, nexus relations happened in school, on the street, at University and in the home. Indeed, we can further focus on local spaces of the home, from the balcony, to the kitchen, from the table, to the plate. We can see the spatialities of connection, where food cooked in one place is connected to eating on the move, for example.

Yet we also witness how the assumed primacy of the “water–energy–food” triad is undone by other, more complex, everyday, material and embodied forms of connection. In Isabelle's drawing, the bicycle connects the supermarket where she does her shopping (the photo in the middle of the poster shows “the weekly shopping done in a supermarket located one-km from home”), to the home where the food is prepared and consumed (next photo on the bike's route in the poster), to the University (i.e., the “FEG” house in the poster), where some of that food is also brought and consumed (see the photos linked to the “FEG” house), often on the go. She uses a bicycle because it is cheaper than a car but also safer than walking. Through a combined nexus-new-materialist lens, the supermarket, the bicycle, the backpack and the bike's basket (to carry books and the shopping), the home, the street, the university, the food she buys and the (embodied) energy she saves by not walking (and more besides) were all constitutive of the multiple, complex, social-material connections that made up Isabelle's nexus (Horton & Kraftl, 2018).

Third, Isabelle's visual web was indicative of the many other ways in which – through our “nexus” approach – young people articulated manifold, complex, material everyday connections in which “natures” and “natural resources” were entangled. Food was a particularly telling example of such complexity. A recurring practice mentioned by University students was the bringing of home-made food cooked by their parents (typically mum or grandmother) from their hometown; often, this included meat from their family farms. The reasons for doing so included time pressures, taste and the sociabilities of food, highlighting an acute awareness not only of the “origin” of food-as-resource, but its provenance as socially constituted matter. The practice of young people bringing meat and other produce from home signalled again the importance of understanding the spatialities of nexus connections. Young people in our research argued that food (and especially meat) brought from home not only tasted better but was a material signifier of “good food” (Sage, 2003), given the predominantly rural location of many students’ family homes, and given their ideals about wholesome, “traditional,” family cuisine. The practice of bringing food from home therefore evokes a material-semiotic that folds images of rural landscapes and familial connection into sites of everyday food consumption (Coles, 2014; Coles & Crang, 2011).

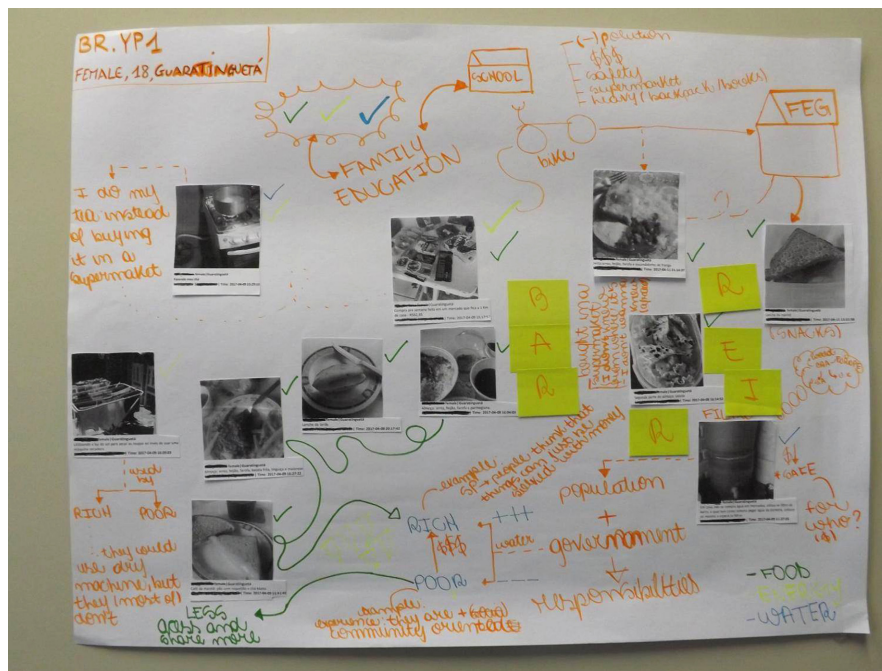


FIGURE 3 Visualising the nexus (Isabelle, Female, 18); the bicycle is shown towards the middle at the top of the visual web.

Finally, young people's narratives of WEF were typically underpinned by a strong sense of connectedness in terms of care for others, which was often articulated as a wider sense of social (in)justice. Interviewees sometimes explicitly described their community's WEF resources in terms of inequitable access to capital. For example, one participant (Paulo) spoke of the centrality of money in the nexus and the impact of ebbs and flows of money within his family on his experience of WEF. As a much younger person from a more impoverished background, Paulo's experiences were very different from those of the students analysed above. For Paulo, feeling hungry was core to his experiences of the nexus. During his visual web activity (not shown here), Paulo started from food (clearly his most pressing need), drawing a telling comparison between what he defined as "special food" and "necessary food." He elaborated:

Paulo: At home I don't have this; it's difficult to have *canjica* (hominy) at home; when we have money we buy what is necessary, and popcorn when we have corn.

I: So what is it that is necessary?

Paulo: Rice, beans, sometimes sugar, salt, uhm ... pasta, and ... seasoning ... I think that's it. (Paulo, Male, 11)

Yet Paulo recounted not only how he tried to earn small amounts of money to support his own family, but how other (equally impoverished) families in the neighbourhood would try to support his family as best they could – for instance through providing sugar when they had run out. Young people were acutely aware not only of the inequities of life in Brazil – and how these were centred on unequal access to the WEF nexus and associated vulnerabilities – but how these kinds of caring dispositions were central to dealing with what are often termed rather glibly in nexus literatures "nexus threats" or "trade-offs" (critiqued by Cairns & Krzywoszynska, 2016). Thus, in another community, Victor also made connections between money, the nexus and broader, material, family circumstances when talking about a friend's mother being unemployed and the father who had left the family; these interdependencies were vital in his experience of the WEF nexus.

I don't know what could be done really, because it's a complicated situation ... she [as a single mother] couldn't find a job, the job she had also did not pay well enough for her to buy food sometimes ... father has abandoned him [the son] and has left his mother alone to get the money in the family, I think his mother also has not finished school [...] I think it was also the difficulty of getting a job itself, because she lived very far from the city ... she didn't have a car or anything, she had to go to places on foot... (Victor, Male, 15)

In a telling spin on both nexus thinking and discourses of nature "deficit" (Louv, 2008), this young participant saw in a series of interconnected "lacks" the main causes leading to issues of resource inaccessibility and deprivation: lack of food; lack of a father who could help with the income; the subsequent lack of money; the lack of job opportunities; the lack of education which could give the mother better chances to find a job; the lack of affordable transportation which could ease getting around for job hunting and food shopping, and far more besides. These were all perceived by Victor as key parts of a complex, "complicated" web of "lacks" – of (dis)connections or deficits in the nexus.

In instances such as these, young people's narratives of WEF became explicitly politicised as their everyday experiences of living with WEF interdependencies (or shortages or crises) directly impacted on their bodies, their material conditions, and the families and communities about whom they expressed care. In direct contradiction to the views of many key professionals – who viewed contemporary youth as ostensibly individualised – often, our discussions with young people about WEF developed into participants questioning contemporary society, politics and corruption. Critically, they also discussed how WEF connections might, in future, be otherwise, and how young people could be agents of change.

The role [of young people in advocating for sustainability], I think, it's the politics, you know. We young people start to see this different world from older people, and then we have to elect someone who will do the good thing for the planet, you know. And that's where it gets controversial: what is the good thing, you know ... then a lot of fight, a lot of debate, but ... it's more political than ... than actually doing something. (Mauricio, Male, 18)

We were struck by how young people used these tropes to overcome a sense in which individuals or families should be responsabilised for sustainability. Indeed, many of them argued that the State and, in particular, the local municipal authorities should take greater responsibility for helping families who are struggling to balance their needs for WEF. For instance, in a conversation echoing Katz's (2011) provocative theorisation of the world's poor children as the "waste of the world," Jose referred to the marginalised within the nexus as "scavengers" in need of greater State support:

Here in Guara [Guaratinguetá] has lots of families that needs this help, you know? So I think State should, and must, help these people [scavengers], but it's very difficult to ... help all of them. So I think it's hard. But it's necessary. (Jose, Male, 18)

In this section, we have argued that a “nexus approach” enabled more nuanced, more complex and, simply, *more* connections to be forged between and beyond the assumed, stable triad of the “WEF” nexus. The everyday, embodied nexuses of children and young people in Brazil were constituted by bicycles, transporting food from home, familial and community relations, questions of social and economic justice, and far more besides. Critically, then, our approach has *also* enabled us to witness arrays of connections that complicate and extend well beyond those (prevalent) childhoods–natures discourses that would see children spend time outdoors in “wild” environments or being educated about the sources of their food. Contrary to the assessments made by some key professionals relating to the lack of public knowledge about the provenance of the resources they consume, many children and young people who took part in the research were acutely aware of the sources of their food (and other resources), and on that front we would make two observations before moving on. First, that, in complexifying nexus connections, young people also complicated notions of the (“natural”) provenance of food, by signalling its embeddedness in material, social and semiotic practices (such as familial traditions, imaginations and memories for those students bringing food from home). Second, that, far from being the passive dupes of cultures of (corrupt) individualisation, as some key professionals in our research would have it, young people were themselves critical of those self-same cultures. They expressed empathy and care with those in difficult situations and promoted a thorough-going critique of the State, whose role in dealing with nexus “threats” (figured as “lacks,” deficits or disconnections) they thought should be amplified.

6 | CONCLUSION

The complex, caring and politicised narratives espoused by young people in our research constitute a fundamental challenge for those seeking to developing affirmative educational or political interventions in relation to WEF in Sao Paulo State, Brazil, and beyond. Read alongside the overlapping (but also conflicting) views of key professionals, the first contribution of this paper is therefore to question the rather patronising, if not in *some* contexts misdirected assumption that young people should be “(re)connected” with natures, and especially the sources of their water, food or energy, in fairly straightforward, often essentialising ways. Nonetheless, as we argued at the beginning of this paper, we are not arguing that all efforts to (re)connect children and young people with natures are inappropriate. We do not seek entirely to work against or dispense with notions of (re)connection, since – albeit in an expanded way – such notions might be conceptually, analytically and politically useful. Rather, we have sought to introduce and evidence (even) more careful, critical and sensitive understandings of the idea of “(re)connection.” Critically, our “nexus approach” – which sought to remain open to manifold possible connections and disconnections – highlighted multiple, nuanced, complex ways in which young people and key professionals articulated and experienced the WEF nexus. It did so in a way that challenged the dominance of water, energy and food (Schwanen, 2018) – witnessing the entanglement of many materialities, concerns and processes, across scales: regional transport networks, national and regional corruption, money, land, bicycles, and dispositions to care. Additionally, it signalled inequities, deficiencies and disconnections that threatened the livelihoods of children, young people, their families and their communities. All of this is something that could be explored further in future research both on and beyond childhood studies, and especially in rapidly developing work on “the nexus” in Human Geography: the idea that a nexus approach could – alongside new materialist approaches to childhood and youth, and more longstanding understandings of their political agency and voice (Kraftl, 2013a) – serve as an educational, conceptual and especially political tool to highlight the interdependence of people, resources and the spaces through which they are constituted.

The paper's second major contribution, drawing on research with key professionals and “bottom-up” work with young people in Brazil, has been to shift the debate on the childhood–nature dichotomy away from the Minority Global North. Without wishing either to essentialise or romanticise the Brazilian context, we would nevertheless argue that by moving the research focus away from the Minority Global North, we have been able to (begin to) point to manifold ways in which discourses of (re)connection might be challenged, complicated and supplemented – not least through recognising the multiple constituents of everyday nexuses including but extending beyond water–energy–food. Clearly, future work in other contexts (including the Minority Global North) is required to explore how forms of connection, reconnection and disconnection play out in the lives of other young people, how these are framed or cross-cut by the work of professionals cognate to those in

our research, and how forms of South–South, South–North and North–South learning about childhoods, natures and environmental education might proceed.

Consequently, in the light of our work in Brazil, our third contribution has been – in bringing together work on the nexus with that on childhoods–natures – to begin a process of rescaling for both literatures. As Schwanen (2018) argues, geographers have a critical role to play not only in challenging the global scale of (much) nexus policy making and modelling, but also in understanding and theorising its place-specific manifestations. We have argued and, crucially, demonstrated that – contra most work on the nexus (Leck et al., 2015) – if we are to address nexus challenges and “threats,” we need to focus on the everyday ways in which the nexus is embodied. Zooming in to the local, specific scale – especially of young people’s everyday lives – can be tremendously helpful, and at least afford insights as to how environmental educators (and others) can engage young people and the wider populace on their own terms. At the same time, the narratives of key professionals and young people in Brazil extended beyond the local scale, beginning to afford insights into how the “bottom-up” experiences of individuals, families and communities intersect with the “top-down” view of predominant approaches to nexus governance and how nexus resources have complex geographies that extend beyond our case region.

Although addressing a very significant lacuna in contemporary nexus scholarship, this achievement should not be the endpoint. For – as this paper evidences – some of the comparisons and resonances between the experiences of (especially high-level) policy makers and young people are tentative or tangential, even if others are more concrete. Moreover, as much as this paper has been inspired in part by new materialist theorising, we have – despite our attempts to visualise the nexus through the various mapping tasks – not yet found ways to adequately witness aleatory, energetic or hydrological flows or capacities. We thus call for further, innovative, transdisciplinary scholarship that might find ways to work across the kinds of scales witnessed in this paper and – perhaps through the integration of digital, big data or volunteer-geographic information – to visualise the multiple scales of the nexus simultaneously. In this way, it might be possible to continue to place calls to (re)connect children and young people with “nature” within the political, social and technical contexts that key professionals in our research described during the course of our research. Crucially, however, we would promote a commitment to find ways to do so that do not lose the fine-grained granularity, empathy and political urgency evoked particularly by young people in our research.

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ENDNOTE

¹All names of interviewees are pseudonyms.

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