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Children sustainable behaviour: A review and research agenda

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ABSTRACT

Adopting state-of-the-art practices, this article systematically reviews the extant body of knowledge on children sustainable behaviour. Our review uncovers and synthesises core themes of children sustainable behaviour into an organising framework and offers implications for theory, policy and practice. The paper acknowledges the relevance and interplay of the family and other socialisation agents such as the media and nature, with children to shape sustainable behaviours. The review identifies several gaps in the literature and advances a theoretical and methodological agenda for future research. Our article serves as a strong foundation for consumer researchers interested in contributing to knowledge on children sustainable behaviour.

“You have stolen my dreams and my childhood with your empty words, ... We are in the beginning of a mass extinction and all you can talk about is money and fairy tales of eternal economic growth - how dare you!” climate activist Greta Thunberg to world leaders (Thunberg, 2019; UN Climate Action Summit, New York).

1. Introduction

Children sustainable behaviour has received significant practical and scholarly interest. In their Education for Sustainable Development Plan, and the Sustainable Development Goals (SDGs), the United Nations (UN, 2015; UNESCO, 2018) recognise children as drivers of change for a sustainable future. The ongoing sustainability crisis has provoked young activists like Greta Thunberg, who urge governments and businesses to become environmentally conscious through strikes, conferences, parliament speeches and worldwide protests (Nevett, 2019). Frozen food leader McCain (McCain, 2020) identifies family mealtimes are dominated by the ‘Greta effect’, with recycling and climate change as hot topics; The Lego Group announced how children prompted the removal of single-use plastic packaging (BBC News, 2020). Research by Kids Insights (Richardson, 2019) reveals one in three children is environmentally conscious and has a different approach to packaging, fast fashion, and technology. Undeniably, children of the current generation attribute increasing importance to environmental sustainability. They

are sensitive to a multitude of media formats, including virtual reality (Smit et al., 2021), increasingly engage in sustainability debates, with a duty to learn, educate others and lead a better world (Wallis & Loy, 2021).

Children also influence their families’ purchases, and constantly socialise into becoming full-fledged consumers (John, 1999). In their Kidfluence Global study¹ across 16 countries, Viacom (2018), a leading media company, identify 8 in 10 parents who confirm that kids have a say in family purchases and activities, ranging from shopping for toys, entertainment choices, vacations, day trips, eating out to what car to buy. In another research in the US conducted by large conglomerate Procter and Gamble², 9 in 10 parents reveal that their children influence their sustainable behaviour at home. The endeavour to understand children consumers is challenging, as marketers and researchers attempt to investigate continuously developing minds and behaviours (John, 1999; Williams et al., 2016, 2021). Children form sustainable habits from a young age through exposure to socialisation agents (e.g. parents and teachers), store visits and brands. They acquire knowledge, skills, and attitudes to develop habits and behaviours which last through adulthood (Ward, 1974; Moschis & Churchill, 1978).

Drawing on White et al. (2019), we define children sustainable behaviour as a set of actions taken by children, within or outside their family contexts, that lead to a reduction in harmful environmental consequences and use of natural resources. Children sustainable

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¹ <https://insights.viacombs.com/post/kids-are-engaged-consumers-who-exert-a-powerful-influence-on-family-purchases/>.

² It’s Our Home” Study, conducted by P&G hosted on Toluna, surveying 1125 consumers in the US, Feb 8th, 2021.

behaviour includes environmentally friendly purchases, recycling, waste management, conservation of resources such as electricity (e.g. Grønhoj & Thøgersen, 2012), and a reduction in the use of fast fashion (e.g. Ritch, 2019). Children sustainable behaviour is practised by children, or parents on behalf of, for, or together with their children, across a variety of activities internal or external to the household, ranging from diet to transportation. In this paper, the term ‘children’ includes children from infancy through their toddler, to adolescent or teenage years (up to 19). We adopt a similar categorisation to Moore et al.’s (2017) study on obesity where children are defined as being 19 years and under.

As much as children can be active and effective in bringing sustainability to life, children behaviours occur as a result of several influences involving their parents, schools, teachers, peers, and the media. For instance, waste management or recycling, by children in their homes necessitates a level of collective action between family members to change established practices, thus rendering sustainable action more challenging compared to the individual consumer (Schill et al., 2020). If sustainable action is supported by parents who hold ultimate responsibility for household matters, the resulting joint actions are more likely to contribute to children sustainable behaviour.

Research on children sustainable behaviour spans across various disciplines including education (Trott, 2020), psychology (Grønhoj & Thøgersen 2012), transport (Mehdizadeh & Ermagun, 2020), fashion (Norum & Norton, 2017), marketing (Schill et al., 2020) and leisure (Waygood et al., 2019). Existing studies also focus on countries such as the UK (Ritch & Brownlie, 2016), France (Schill et al., 2020) and India (Singh et al., 2020), and cover various age groups [e.g. 0–3 years (Carey et al., 2008); 7–11 years (Schill et al., 2020); and 12–18 years (Gentina & Muratore, 2012)]. Despite the significance of children in propelling sustainable behaviours, knowledge to date remains fragmented. In particular, no study exists that integrates the substantial volume of dispersed and inter-disciplinary research into a comprehensive, state-of-the-art systematic review. The first conceptualisation on environmental sustainability and children (Easterling et al., 1995) to appear in the business literature is dated. To broaden the scope of our thinking, there is a need to synthesise collective evidence, identify inconsistencies in prior research, and build a coherent body of understanding to advance theories and practice (Palmatier et al., 2018; Snyder, 2019).

Accordingly, this paper systematically reviews the cross-disciplinary research on children sustainable behaviour. A domain-based (Palmatier et al., 2018) synthesis approach was chosen to summarise and integrate current understanding across multiple theoretical and methodological perspectives (MacInnis, 2011). Such synthesis is relevant when the topic of interest is scattered across different bodies of literatures, helping to identify gaps, highlight commonalities that build coherence (Cropanzano, 2009) and point the way forward for future research on children sustainable behaviour.

The contributions of this review are threefold. First, it synthesises multiple literature streams to provide comprehensive insights into key trends, themes, methods, theories commonly adopted to investigate children sustainable behaviour. Our study explores how socialisation agents such as the family, media, marketing and non-marketing stimuli, exposure to nature and peers inculcate environmental psychological predispositions to children and influence children sustainable behaviours. Furthermore, our paper discusses interplays involving family communication, socialisation, resocialisation and inter-generational transmission, between the family and children. From a practical and policy point of view, children sustainable behaviour is a prominent topic as recognised by the UN (2015) SDGs and business corporations (e.g. P&G, McCain, The Lego Group). Additionally, by focussing on children, an important component of societies, this paper contributes to the societal and planet perspectives of Responsible Research in Business and Management as advocated by Haenlein et al., (2022). Second, we draw upon and extend Easterling et al.’s (1995) conceptualisation of children ‘environmental consumerism’. Easterling et al.’s (1995) framework is dated and portrays the school of thought prevalent in the 1990s. Back

then, amalgamating prior research was not based on state-of-the-art guidelines and therefore fail to provide a collective and up to date assessment of evidence from interdisciplinary fields. We build on Easterling et al., (1995) model, by explaining how socialisation agents such as the family, media exposure and peers contribute to children psychological predispositions and influence children sustainable behaviour, via interplays such as inter-generational transmission and family communication. Other than children concern for the environment (Easterling et al., 1995), our framework incorporates additional children and parent psychological predispositions, such as environmental attitudes. Finally, we propose several areas for future research addressing both theoretical and methodological issues to further advance the field.

2. Method

To ensure a rigorous, replicable and transparent process, we employ a systematic literature review method (Tranfield et al., 2003; Denyer & Tranfield, 2009). State of the art guidelines (e.g. Booth et al., 2012; Snyder, 2019) were followed to define the review scope, establish article selection criteria, extract data, synthesise results, develop an organising framework and formulate a set of areas for future research on children sustainable behaviour. The methods used to perform these activities are described below.

2.1. Search strategy

Article identification is core to systematic literature reviews (Littell et al., 2008; Snyder, 2019). To identify relevant papers for this review, we follow the PRISMA protocol (Moher et al., 2009; Moher et al., 2015). Originally developed for use in healthcare, and increasingly popular among researchers in the fields of business and marketing (e.g. Paschou et al., 2020; Lim et al., 2021; Tueanrat et al., 2021), PRISMA facilitates the preparation and reporting of data for systematic reviews. The protocol consists of four stages: identification, screening, eligibility, and inclusion.

Identification. This stage was executed based on four considerations: database, keywords, source type and period. First, and similar to Tueanrat et al., (2021), to ensure a comprehensive coverage of relevant literature, the search was initially conducted in three major electronic databases: Scopus, Web of Science, and EBSCO. Second, Boolean combinations of relevant search strings including ‘green consumer’, ‘sustainability’, ‘sustainable consumption’, ‘sustainable behaviour’, ‘consumer socialisation’, ‘pro-environmental behaviour’ and ‘child’, appearing in Titles, Abstracts or Keywords, were applied to each database. Third and consistent with previous systematic reviews (e.g. Srivastava et al., 2020; Kahkonen et al., 2021; Vlacic et al., 2021), we consider only peer-reviewed journals to ensure conceptual and methodological rigor. We did not include book chapters, book reviews, conference proceedings, editorial notes, non-academic and non-published studies. Articles should be in English and located with the disciplines of business and management, psychology, and environmental science. Fourth, we did not impose any time constraints, enabling us to depict evolution of the research topic. Searches were carried out between July 2020 and August 2020 with an update in September 2021. The searches yielded 2598 papers, covering a period of 28 years from 1993 to 2021.

Screening & Eligibility. The screening stage was executed by eliminating duplicates from the three databases. Using excel, 81 papers were eliminated, leaving a total of 2517. The eligibility phase was performed through abstract scanning. Articles were evaluated based on two major considerations. First, a paper was retained if the focus was on children sustainable behaviour. Second, articles addressing the specificities of children education such as curriculum, school design, teacher training on children sustainable behaviour, were omitted. Environmental education is a substantive topic warranting separate review(s) due to the volume of publications, and hence fall beyond the remit of this paper

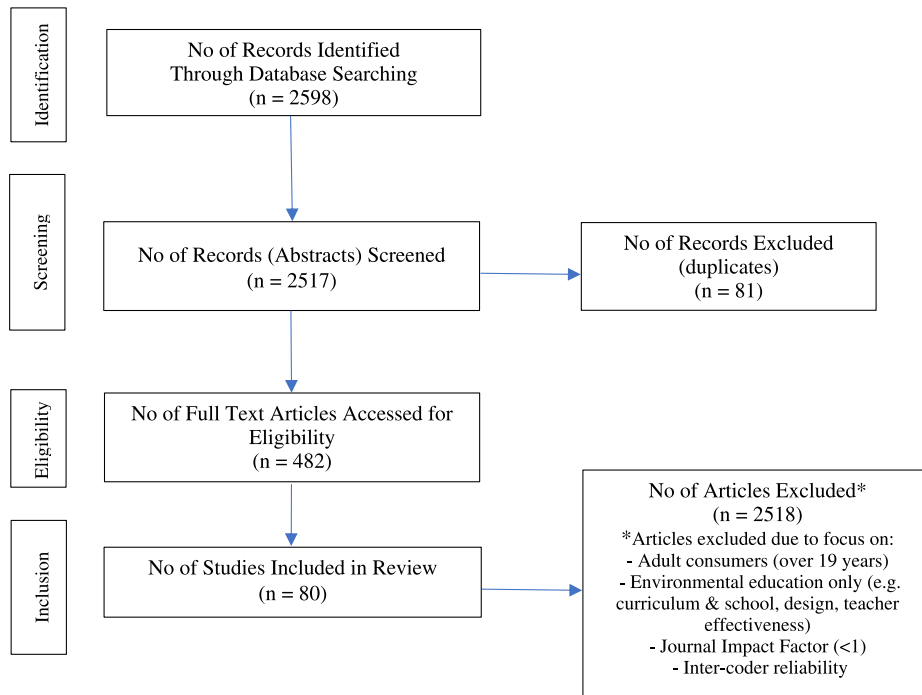


Fig. 1. Flow Diagram for the Selection of Literature Reviewed based on PRISMA.

(see section 6.7). As a result, the initial list was narrowed down to 482 papers.

Inclusion. At this stage, the full text of each paper was consulted where necessary, to ensure consistency with our definition of children as including teenagers. Thus, publications focussing on children sustainable behaviour, with children up to and including 19 years old were retained. We also include papers with parents as respondents, where studies are carried out with very young children [e.g. 0–3 years; Carey et al., 2008], or where children behaviours were assessed from parents’ point of view (Ritch & Brownlie, 2016). In fact, parents as the main socialisation agents (Carlson & Grossbart, 1988) convey norms, attitudes, and motivations of acceptable behaviours to children (Moschis & Churchill, 1978). The results were cross-checked with bibliography search, that is back-tracking, via Google Scholar (Booth et al., 2012), resulting in a paper sample of 114.

Adopting Paul and Criado’s (2020) guidelines, only papers from journals with a cut off impact factor of 1.0 were retained, reducing our sample to 94. To avoid possible subjective bias in the selection of articles and to ensure good interrater reliability, two of the three authors

independently read the full text of 94 papers. Disagreements were resolved through discussion and consensus among the co-authors. The intercoder reliability was high with 96.2% agreement between the coders, exceeding the conventional benchmark of 80% (Belur et al., 2021). As per Fig. 1, a corpus of 80 relevant papers (Web Appendix 1) from journal outlets (Web Appendix 2) was retained for this review.

2.2. Coding and synthesis

The 80 papers were content analysed in two stages, consistent with prior systematic review articles (e.g. Cinar et al., 2019; Vicente-Saez & Martinez-Fuentes, 2018; Ojansivu et al., 2020). First, we manually develop a data extraction process to record details from each paper into a codebook (Littell et al., 2008). The codebook includes information such as standard bibliometric details, method used (conceptual, quantitative, qualitative or mixed methods), unit of analysis (child, parent, or parent–child dyad), behaviour category studied (e.g. energy use, food waste), and theories in use among others. Second, to increase coding objectivity, the research team independently and inductively coded

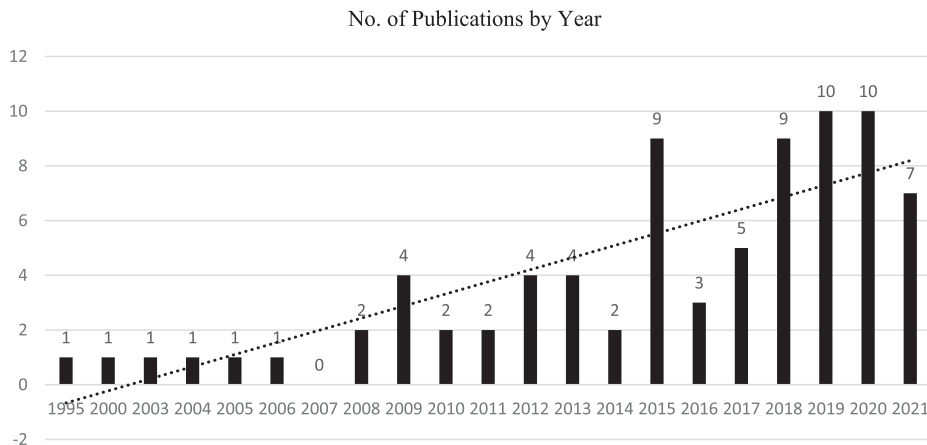


Fig. 2. Number of Publications by Year.

Table 1
Publications by Geographic Focus, Stage of Cognitive Development and Unit of Analysis.

	No. of Publications
Continent*	
America	8
Asia	12
Australia	9
Europe	46
Mixed	2
Multiple	1
Stage of Cognitive Development** (years)	
Sensorimotor (0–2)	1
Pre-Operational (2–7)	8
Concrete Op (7–11)	9
Formal Op (11–19)	25
Mixed Ages	30
Unit of Analysis	
Child Only	40
Parent Only	12
Parent- Child Dyad	16
Children, Parent, Teachers	3
Others (databases, best friends)	5
Conceptual	4

* Sample includes 4 conceptual papers: one set in Australian and one in European context; these 2 papers are factored in the continent numbers, remaining two papers are not bound geographically.

** 7 papers did not specify child age (4 conceptual papers; 3 papers use parents only as unit of analysis and refer to school children or young kids).

sample papers to identify core themes using the Gioia methodology (Gioia et al., 2012). We followed an inductive approach to categorisation, allowing themes to directly emerge as opposed to a priori coding system. The iterative process of reading the articles, identifying core themes and classifying articles stopped when theoretical saturation was reached. First order, second order categories and broader level aggregate themes are summarised in Table A1, Appendix 1. At the outset, and throughout coding, random samples of articles were cross-checked by researchers to ensure consistency. The research team also sought for conceptual integration of the distinct categories and themes, to conclude on consumer socialisation as overarching theory. We draw on core themes for meta-level synthesising and formulate future research directions (Snyder, 2019).

3. Findings

3.1. Progression of research

Publication by Year: The papers in our review were published between 1993 and 2021. Fig. 2 depicts the yearly progression, noting a sharp increase from 2015, with almost 70% of papers published between 2015 and 2021. Interestingly, this increase coincides with the adoption of the 17 SDGs by all member states of the United Nations in 2015, with SDG 12 in particular relating to sustainable behaviours such as better use of resources, waste reduction, recycling, reuse and responsible consumption. The importance attributed to sustainability by the United Nations, together with the notable increase in academic articles since 2015, is testament of the need to synthesise current knowledge, facilitate understanding and enhance future development (Tranfield et al., 2003; Patriotta, 2020).

Publication Outlets & Geographic Focus: Research on children sustainable behaviour appears in a wide range of academic outlets, portraying its ubiquity and interest across many disciplines (e.g. environmental psychology, tourism and management; see Web Appendix 2). Additionally, an overview (see Table 1) of publications by continent reveal that there has been an overwhelming geographical research focus on Europe. There is limited research in Asia and America – a concerning observation, given the contribution of countries like the

US, India and China, towards CO₂ emissions (Ritchie & Roser, 2020).

Publication by Children Stage of Cognitive Development: Our review (see Table 1) identifies that most studies focus on children from mixed-age groups. Researchers (Piaget, 1964; John, 1999) ascertain cognitive age or status, as a key developmental criterion. As they grow, children undergo a complex phase of cognitive and social developments. They progress through a series of stages and become more sophisticated in their decision-making. Children at the sensorimotor stage (0–2 years) recognize logos. Between 2 and 7 (pre-operational stage) they can convince parents to buy specific products. From 7 (concrete operational stage), kids embrace a more realistic view of the world, and adopt peer influence. Beyond 11 years (formal operational stage), they can use interactive media for purchases (Valkenburg & Cantor, 2001).

Similarly, a marked shift in sustainable behaviour could be expected as children progress from sensorimotor to the formal operational stage. However, research demonstrates that older adolescents engage less in sustainable behaviours due to natural developmental trends (Collado et al., 2015b) and decline in social responsibility values (e.g. Krettenauer, 2017). Our review further notes limited research specifically comparing sustainable behaviours within, and between age groups or stages of development. Studies focusing on younger children are particularly scarce, given the inherent ethical challenges and cognitive processing complexities required (see Nairn & Clarke, 2012). Child age is predominantly reported as a demographic classification in most studies.

3.2. Methods in use

In this section, we synthesise the methods applied by the 80 articles in our review, in terms of research approach and unit of analysis. Most studies adopt either a quantitative (N = 44) or qualitative (N = 29) method to collect data. Quantitative studies, with the exception of few experiments (e.g. Kolandai-Matchett, 2009; Charry & Parguel, 2018), mainly utilise cross sectional survey methods (e.g. Grønhoj & Thøgersen, 2009; Singh et al., 2020). Qualitative papers adopt methods like participatory action research (e.g. Schill et al., 2020), interviews (e.g. Ritch, 2019) and focus groups (e.g. Soryte & Pakalniskiene, 2019). Three papers, (e.g. Melis et al., 2020; Giusti et al., 2018) employ mixed methods, a combination of surveys and interviews. Four papers were conceptual, with Easterling et al., (1995) being the sole work appearing in the business literature. (See Appendix 3 for an overview of main methods in use).

Consistent with the dominant approach in family research, the unit of analysis was either children only, parents only, or parent–child dyad. Wind (1976) was among the first studies to acknowledge that the unit of analysis in family research should be the household, or any combination of members within it. Despite the methodological and ethical considerations, involved in collecting data with children, our review (see Table 1) reveals a large number of studies (N = 40), still use children (even if mostly in the formal operational stage, > 11 years) as respondents (e.g. Donovan, 2016; Lee, 2011).

Studies that collect data from children only draw their sample from respondents aged 3 years and above. For example, Spiteri (2021) utilises participatory action research methods including observations, interviews and drawings, to investigate 3- and 7-year olds' understanding of the need to protect the environment. Borg et al., (2019) interview pre-schoolers (5–6 years) to assess their environmental knowledge regarding alternative transport modes. Melis et al., (2020) apply mixed methods (interviews with children aged 5 to 6; questionnaire with parents and school teachers) to demonstrate that children leaving kindergarten had some understanding of sustainability given their exposure to nature. For studies using children over 11 years, there is a preference (over 65% of papers) for quantitative, survey techniques given this age group's higher level of cognitive development (Piaget, 1964). Overall, the use of younger children in research remains challenging and in itself represents an area warranting future research attention.

Table 2
Underlying Theories of Children Sustainable Behaviour.

Underlying Theories	Description	Examples	No. of Publications
Environmental Consumer Socialisation Resocialisation	Learning and applying environmentally friendly behaviour by children. Persuading parents to behave as environmentally conscious consumers.	Easterling et al., (1995); Singh et al., (2020) Gentina & Singh, (2015)	10
Norm Activation Theory	Consequences, responsibility and norms predict altruism.	Mehdizadeh & Ermagun, (2020)	4
Value Identity Personal Norms (VIP) Model	Extent to which biospheric values relate to self-identity and predict eco-friendly behaviours.	Zeiske et al., (2020)	4
Theory of Planned Behaviour / Reasoned Action	Intention to carry out a task is determined by intention, dependent on attitudes, subjective norms and perceived control.	Lee, (2011); De Leeuw et al., (2015)	3

3.3. Children sustainable behaviour: underlying theories

Our review (see Table 2) identifies the most common theories or frameworks applied to investigate children sustainable behaviour.

The first and most applied theory is consumer socialisation/resocialisation. Ward (1974) defines consumer socialisation as the process where children acquire the skills, knowledge and attitudes relevant to become consumers. As per Ward (1974), and Moschis & Churchill (1978), socialisation is a combination of learning and modelling processes. As young children grow up, they observe the behaviours of socialisation agents in their immediate environment. Parents, peers and school teachers, act as role models (Ward, 1974; Moschis & Churchill, 1978). Extending on consumer socialisation, environmental socialisation (e.g. Gentina & Muratore, 2012) is framed as the way children adopt environment-friendly behaviours, based on their interaction with socialisation agents. The field of children sustainable behaviour also evokes the concept of environmental resocialisation, or reverse socialisation, a process where children influence their parents to behave in pro-environmental ways, through reducing energy use, recycling, energy-friendly consumption and transportation (e.g. Gentina & Muratore, 2012).

Other relatively less applied frameworks in the domain of children sustainable behaviour include the Norm Activation Theory (Schwartz, 1977), Theory of Planned Behaviour (Ajzen, 1985), and Value-Identity-Personal (VIP model) Theory (van der Werff & Steg, 2016). Norm Activation Theory (Schwartz, 1977) focuses on how an awareness of consequences, or, potential threats to others, lead to mitigating actions or ascription of responsibility by individuals on behalf of others. Personal norms predict altruistic behaviours, or concern towards others, rather than the self, expressed via pro-environmental behaviours. Mehdizadeh & Ermagun (2020) apply Norm Activation Theory to understand children travel behaviour to school. In their study, Mehdizadeh & Ermagun (2020) collect data from parents, given children lower decision-making authority and dependence on parents for school runs. Findings indicate children from families with stronger environmental norms, have a preference to reduce car use and utilise alternative transportation modes, such as walking, biking, public transport, to achieve environmental benefits. It is reasonable to expect that transmitting environmental norms from parents to children in the early years will influence future habits.

The Theory of Planned Behaviour (Ajzen, 1985), assumes that attitudes, subjective norms, and perceived control, determine intention and behaviour. Attitudes are shaped by individual beliefs; subjective norms are based on what is expected from others, such as parents, friends or society in general, and perceived control refers to the perception of ease or difficulty with which an action can be executed. De Leeuw et al., (2015) identify an excellent fit between high school students' (12–16 years) attitudes, subjective norms, perceived behavioural control and intentions towards sustainable behaviour. The Value-Identity-Personal Norms (VIP) Model (van der Werff & Steg, 2016) proposes that individuals' [children] endorsement of biospheric values (importance of preserving the nature and environment), influences their environmental self-identity. Self-identity, the degree to which children see themselves as eco-friendly predicts environmental behaviours. In their application of the VIP model to a sample of primary and secondary school students in the Netherlands, Zeiske et al., (2020) confirm that children biospheric values relate to their environmental self-identity and energy conservation. Alternative relevant theorisations exist to investigate children sustainable behaviour and are elaborated under the areas for future research (section 6.4).

4. Emerging themes

Further to the inductive coding of our sample of 80 papers (see section 2.2), the identification of first order categories, second order and aggregate themes based on the Gioia et al., (2012) method (Table A1, Appendix 1), the following sections summarise and synthesise extant research on children sustainable behaviour.

4.1. Socialisation agent: the family

The family is a dynamic social group and plays an important role in children consumer socialisation (Moschis & Churchill, 1978; Moore et al., 2017). Our review recognises that family demographics and parents' psychological predispositions play an important role in children sustainable behaviour.

4.1.1. Family demographics

Family characteristics include variables relating to demographics, such as the presence of children, (Juvan et al., 2018), income or more general socio-economic status (Mehdizadeh & Ermagun, 2020) and country (Diamantopoulos et al., 2003). Studies measuring these variables span across children age groups [e.g. 0–14 years (Ritch, 2019); 6–16 years (Grønhøj, 2006)] and have produced fragmented and inconclusive findings. Norum and Norton (2017) discern a negative relationship between the number of toddlers; and a positive relationship between children aged 6–17, and parents' eco-friendly behaviours. Research evidence on the influence of family socio-economic status (SES) on children psychological predispositions is mixed. For example, Duarte et al., (2017) note a significant and positive relationship between family SES and adolescent attitudes towards sustainability. On the other hand, Casalo & Escario (2016) establish a negative link between family SES and children environmental concern. Other studies confirm the positive relationship between parent education level, children pro-environmental behaviours (e.g. Evans et al., 2018) and environmental concern (Meeusen, 2014). Children sustainable behaviour also varies across countries. For example, Lee (2008) identifies that adolescents in Hong Kong have a notable influence on sustainable purchase behaviour. Grønhøj (2006) establishes that Danish adolescents do not positively influence organic food purchase, or household waste disposal. Gentina & Singh (2015), in their comparative study further identify that French teens have a higher influence on parent resocialisation in relation to Indians.

4.1.2. Parents psychological predispositions

Parents' psychological aptitudes such as environmental norms

(Matthies et al., 2012), values (Gong et al., 2021), awareness (Mehdizadeh et al., 2019), attitudes (Grønhoj & Thøgersen, 2012), concern (Meeusen, 2014) and knowledge (Ritch & Schroder, 2012) influence children psychological predispositions and sustainable behaviour. Parents remain the primary socialisation agents (Carlson & Grossbart, 1988), and households, rather than individual consumers, have the ultimate power to drive sustainable action (Scott et al., 2015). Significant decisions occur within the family context, where individuals act as a result of influence (Blood & Wolfe, 1960) and interactions (Cowan et al., 1984).

Environmental Norms: Parents socialise their children to conform to family and societal norms. One of the main theories used to explain sustainable behaviour is the Norm Activation Theory (Schwartz, 1977), where individuals' moral obligations lead them to behave in a particular way. Our review identifies that parent environmental norms remain crucial in instilling similar norms in their offsprings (e.g. Matthies et al., 2012). Norms, either personal or subjective/social (based on the expectations of significant others) dictate several behaviours. Mehdizadeh & Ermagun (2020) and Mehdizadeh et al., (2019) discern that parent personal norms towards car use leads to more sustainable transport choices for children school trips. Matthies et al., (2012), Ando et al., (2015), and Collado et al., (2019) investigate the influence of parents' personal and subjective norms on children behaviour. Indeed, children are more likely to be influenced by the expectations set by their parents.

Environmental Values: Values refer to enduring beliefs regarding modes of conduct or states of existence, that are personally and socially preferable. Values guide attitudes, actions, judgments, define personal goals and provide standards to evaluate, justify and compare attitudes and behaviours relative to others (Rokeach, 1968). In their study with parents and Danish adolescents, Grønhoj & Thøgersen (2009) establish a positive relationship between parents and children environmental values. In a more recent study using parent–child dyads (10–15 years), Gong et al., (2021) identify that parents' green values were positively related with their children.

Environmental Awareness: Parent environmental awareness is evidenced through being mindful of the environment and acting on its behalf. In our review, environmental awareness is demonstrated via parents' attention to, and appreciation of sustainable behaviours, given the potential for harmful consequences. In turn, parents anticipate corresponding awareness from their off-springs (Halicka et al., 2021). Thus, realisation of environmental impacts due to: the use of one or more transportation modes for school trips (Mehdizadeh & Ermagun, 2020); the purchase of sustainably sourced food (Edwards et al., 2013); or engaging in sustainability related conversations (Halicka et al., 2021) demonstrate how parents display environmental awareness with respect to their children.

Environmental Attitudes: Parents' environmental attitudes refer to their positive or negative psychological evaluation of the environment (Milfont & Duckitt, 2010). Grønhoj & Thøgersen (2009) specify how parents and their adolescent children aged between 16 and 18, hold similar attitudes towards buying organic and environment-friendly products. In their longitudinal study with children at 6 and 18 years old (12 years apart), Evans et al., (2018) reveal that children with mothers of higher environmental attitudes, engage more in sustainable behaviours. However, parents' environmental attitudes not always influence children sustainable behaviour (e.g. Collado et al., 2017). In fact, Grønhoj & Thøgersen (2012) attribute children sustainable behaviour to prevalent family norms and sustainable behaviours, rather than parent attitudes. We discern a discrepancy in actual behaviours, leading to the need for additional research on the attitude behaviour gap (Carrigan & Attalla, 2001; Carrington et al., 2010), a state, where consumers do not materialise their attitudes into actual purchases.

Environmental Concern: Beyond norms, awareness and attitudes, several studies in our review investigate the relationship between parents' environmental concern, or support and willingness to solve environmental issues with sustainable behaviour. Parental concern towards

the environment starts developing from child birth. Ritch (2019) shows how mothers of children as young as two years old, become part of supporting communities, by sharing, exchanging, donating or recycling children clothes. In a multi-national study spanning across 16 countries, Casalo & Escario (2016) provide evidence as to how parents' environmental concern has a crucial influence on children environmental concern. Similarly, Meeusen (2014) confirm the transmission of mothers and fathers' environmental concern to their off-springs.

Environmental Knowledge: Parent environmental knowledge refers to their understanding of environmental problems and identification of possible solutions (Singh et al., 2020). Ritch and Schroder (2012) assess parent environmental knowledge in the UK fashion market. In their study, parents demonstrate knowledge by conveying interest to adopt sustainable fashion for their children, based on convenience and affordability, given how fast children grow. Parents were doubtful on the ethical practices of retailers and could not ascertain the extent to which clothes were produced sustainably. Even if parents were knowledgeable about sustainable children clothing, they perceived ethical fashion to be more expensive. Halicka et al., (2021) note how Polish parents demonstrate environmental knowledge by incorporating sustainable practices in food purchases, limiting waste, buying locally produced options, minimising the purchase of plastic bottles and reinforcing sustainable education from school to influence children knowledge and attitudes towards the environment.

4.2. Other socialisation agents

Research on children consumer socialisation dates back to the 1970s, with Ward (1974) and Moschis & Churchill (1978), establishing the relevance of media, advertising, peers and education as socialisation agents on children learning. In our review, we identify studies investigating the effects of media exposure (Edwards et al., 2013), other stimuli such as packaging (Halicka et al., 2021), peers (Collado et al., 2017) and education (O'Neill & Buckley, 2018; Colding et al., 2020) on children sustainable behaviour. These socialisation agents influence children thinking and reasoning across their cognitive developmental phases, which explain their sustainable behaviours. Thus, in addition to the family as the most important socialisation agent (John, 1999), children sustainable behaviours occur through exposure to media, nature and other stimuli, peer influence and education.

4.2.1. Media exposure

The role of media exposure on children behaviour is widely acknowledged (Buijzen & Valkenburg, 2003; Waiguny et al., 2014). Advertising and other forms of communication constitute important sources of information and knowledge, leading to children purchase requests, materialism and family conflict (Buijzen & Valkenburg, 2003). Excessive media use is often related to exposure to branded merchandise that encourages over-consumption, or materialism (John, 1999), thus taking children away from outdoor activities, exposure to nature and eco-friendly behaviours. Our review identifies some research assessing the effects of media exposure on children sustainable behaviour. Conceptually, Larsson et al., (2010) discuss the effects of traditional media exposure; Colding et al., (2020) and Smit et al., (2021) the role of new digital technologies, such as virtual reality on children sustainability. Empirically research investigates the impact of media such as TV programmes (Edwards et al., 2013; Hawley, 2018) on children sustainable behaviour. Studies in our review span across age groups: 4–6 years (Edwards et al., 2013), 6–13 years (Smit et al., 2021) and 12–18 years (Lee, 2011).

4.2.2. Exposure to nature

Easterling et al., (1995) propose that exposure to nature is essential to build children's environmental concern – a pre-requisite for children sustainable behaviour. Exposure to nature at a young age can happen in the form of outdoor play, green infrastructure in urban areas or

environmental education in schools, and contributes to emotional well-being (Kahn & Kellert, 2002). In fact, multiple studies identify a connection between exposure to nature and children environmental attitudes (e.g. Collado et al., 2015a), knowledge (e.g. Melis et al., 2020) and sustainable behaviours (Barrera-Hernández et al., 2020) including consumption (e.g. Collado et al., 2015a; Evans et al., 2018; Colding et al., 2020). In particular, Nasrabadi et al., (2021) recognise that experiencing nature in childhood, though exposure to natural resources, or interaction with non-human life (trees, plants and animals), creates human-nature bonds, crucial for transforming children into agents of sustainability.

4.2.3. Other stimuli

In addition to media and nature exposure, there are other elements in children surroundings can impact on their sustainable behaviours. Edwards et al., (2013) investigate, from teachers, parents and children perspectives, how marketing stimuli such as brand awareness, promotion offers, licensed characters and packaging have a strong influence on children eco-friendly behaviours. Indeed, children are inundated daily by marketing stimuli in the physical and/or online retail settings, captivating their attention and leading to purchase requests or actual purchases. In their study of mothers as main socialisation agents, Ritch & Schroder (2012) reveal how trust in retailers contributes to environmental sustainability.

Beyond marketing related stimuli, Schill et al., (2020) assess the impact of settings such as the family, school and neighbourhood, and the availability of sustainable infrastructure (e.g. recycling bins) on children sustainable behaviours. Schill et al., (2020) identify that children are more likely to engage in recycling behaviours in places like schools, and playgrounds, where they have access to recycling bins. Hadfield-Hill (2013) examines children living in eco-friendly homes, and attending eco-schools. These children demonstrate a better appreciation and understanding of sustainability, often leading them to act upon their knowledge in public settings such as schools, or private domains such as their homes.

4.2.4. Peer influence

Widespread research demonstrates how children consumers are receptive to peer, or group influence (Moschis & Moore, 1979; Islam et al., 2018). Accordingly, we contend that due to group cohesion - a sense of belonging/bonding, within friendship groups - children are highly likely to be influenced by the eco-friendly behaviours of their peers. Our review identifies research investigating the effects of peer influence across age groups and geographical locations, with a strong focus on adolescents. Lee (2008) establishes social or peer influence as a strong predictor of adolescents' green purchasing behaviour in Hong Kong. Collado et al., (2017) report a strong relationship between Spanish children (9–13 years), and their best friend environmental behaviours, with a higher relationship associated with higher age. Collado et al., (2019) also report a strong relationship between peer influence in the form of environmental norms and teenagers (12–19 years, Spain) on environmental actions.

4.2.5. Education

The role of education within the wider context of sustainable development is pivotal. In fact, the UNESCO (2020) Education for Sustainable Development for 2030 Toolbox recognises education as a key to empower children with long-term knowledge and skills to promote development in areas including climate change, biodiversity, sustainable production and consumption. A rich body of literature (e.g. Bautista et al., 2018; Passmore & Jones, 2019) specifically examines the presence, relevance, implementation and effectiveness of sustainability initiatives in the school curriculum, evaluation of school infrastructure, teacher and other learning facilities. Education remains primary in socialising the younger generation in ways that older ones were not. Our review includes articles on sustainable education, only when studied in

conjunction with other variables (Table A2, Appendix 2).

4.3. Children characteristics

Our review identifies children demographics, children influence and multiple core environmental psychological predispositions conferring expertise, reinforcing beliefs and values, to cast children into environmentally friendly adults.

4.3.1. Children demographics

Stage of Cognitive Development: Of the studies that specifically study the effect of age on sustainable behaviours, we note the work of Collado et al. (2015b). Collado et al., (2015b) establish a significant, negative relationship between age and sustainable behaviours, which the researchers attribute to multiple reasons including changing consumption priorities and the need to fit within peer groups. Additional research by Svetina et al., (2013) with 6–19-year olds, Duarte et al., (2017) with 15-year olds and Stokas et al., (2017) with 9 and 12-year olds, generally remark a positive link between age, understanding and representation of sustainability. However, Svetina et al., (2013) note a dip in sustainability understanding at ages 10 and 14, linked to developmental and school curriculum changes and Duarte et al., (2017) only identify a slight trend given the low variability in age (months) between younger and older students in the same cohort.

Gender: Generally, research recognises how females attach more importance to pro-social values - values benefitting others, rather than oneself (e.g. Beutel & Johnson, 2004). Our review identifies how girls exhibit higher appreciation towards sustainability issues (Svetina et al., 2013), have stronger environmental concerns (Zelezny et al., 2000) and attitudes compared to boys (De Leeuw et al., 2015; Collado et al., 2017; Duarte et al., 2017). Studies ascribe differences in gender due to girls' ability to be more altruistic, have more compassion, and a higher sense of social responsibility. However, in a study on car use in Iran, Mehdi-zadeh & Ermagun (2020) found that parents are more likely to allow boys the use multiple modes of transportation such as walking and buses. Thus, boys are more apt at displaying higher levels of sustainable behaviour, in settings where cultural differences allow girls less freedom to spend time in locations other than schools. Altun (2018) on the other hand does not discern any gender difference in terms of pre-schoolers pro-environmental orientation, a finding attributed to the fact very young children are not yet exposed to gender roles.

4.3.2. Children influence

Children influence relates to the persistent, emotional or persuasive requests made by children to impact, or request purchases from their parents (Galst & White, 1976). Influence occurs when a child behaves or acts in a way to consciously alter the actions of their parents (Cartwright, 1959). In our review, we identify studies examining the effect of children influence (Gentina & Muratore, 2012; Gentina & Singh, 2015; O'Neill & Buckley, 2018) and influence strategies (Singh et al., 2020) in the form of conflict (disagreement), collaboration (cooperation) (Collins, 2015), and family tensions (e.g. bargaining, negotiating) (Walther & Sandlin, 2013), with adolescents and sustainable behaviours.

Contrary to negative connotations associated with children influence, in requesting non-essential products due to advertising (Buijzen & Valkenburg, 2003; Waiguny et al., 2014), marketing exposure such as packaging and peer influence, children requests in the context of environmental sustainability is portrayed as positive pester power. O'Neill & Buckley (2018) define positive pester power as the process children influence their parents to behave sustainably. Ritch and Brownlie (2016) study elements of positive pester power, with children requesting fair trade, that is sustainable, rather than regular, products. Over the years, the concept of "positive pester power" (O'Neill & Buckley, 2018) contributes to our understanding of sustainable behaviours. However, findings are not always conclusive. Grønhoj (2006) found no evidence

regarding teenagers' positive influence on their parents' purchase of ecological products, and limited influence on reduction in water and electricity use. On the other hand, [Ritch & Brownlie \(2016\)](#), identify aspects of positive peer power, with children actively requesting fair trade products over traditional alternatives.

4.3.3. Children psychological predispositions

Environmental Norms: From a children perspective, personal and subjective norms have been studied through multiple theoretical lenses. [Wu \(2018\)](#) identify that children personal norms, or their own moral obligations towards the environment, lead to adoption of sustainable behaviours using the Value Beliefs Norms Theory ([Stern et al., 1999](#)). [De Leeuw et al., \(2015\)](#) study personal and subjective norms using the Theory of Planned Behaviour ([Ajzen, 1985](#)). Descriptive norms, or the belief that people close to them (e.g. parents, peers) will perform sustainable actions contribute more towards children intention to adopt sustainable behaviours, compared to injunctive norms, which refer to the expectations of others on children behaviour. [Balunde et al., \(2020\)](#) investigate personal and subjective norms via the lenses of the VIP model ([van der Werff & Steg, 2016](#)) and the Comprehensive Action Determination Model ([Klockner & Blobaum, 2010](#)), a combination of the Theory of Planned Action ([Ajzen, 1985](#)) and the Norm Activation Model ([Schwartz, 1977](#)). Personal norms were identified as leading to sustainable behaviours as per the VIP model.

Environmental Values: Generally, green values, as guiding principles, are important determinants of attitudes and behaviours ([Rokeach, 1968](#)). In our review, we note that studies generally establish positive relationships with children environmental values and sustainable behaviours (e.g. [Wan Hussain et al., 2021](#)). According to [Stern & Dietz \(1994\)](#), there are also three value orientations: biospheric – concern for nature and the environment, altruistic - concern for other people and egoistic - concern for self, with biospheric values being the better predictors of environmental behaviours. [Zeiske et al., \(2020\)](#) establish that children biospheric values are positively related to energy saving; [Balunde et al., \(2020\)](#) confirm a similar relationship on waste prevention.

Environmental Awareness: Environmental awareness, exhibited through a general consciousness of how decisions impact the natural environment, is a key variable affecting children sustainability. [Borg et al., \(2019\)](#), assess the meaning of the word 'environment' for preschoolers. Children aged 5–6 years old utilise the word in conjunction with location, internal or external to their homes, and sustainable behaviours. [Donovan \(2016\)](#), investigates the concept of environmental awareness with an older group of children (11–13 years). As expected, teenagers' narratives of environmental awareness displayed deeper acquaintance of sustainability, including CO₂ emissions, animal habitat and recycling.

Environmental Attitudes: Consistent with [Klockner \(2013\)](#), we define attitudes as the combination of beliefs individuals [children], hold with respect to a given situation. Attitudes transcend awareness - if children believe in (un)favourable outcomes as a result of their environmental attitudes, opinions, or outlook, they will be motivated to behave accordingly. Most studies in our review investigate environmental attitudes of adolescents, with the exception of [Korukcu and Gulay Ogelman \(2015\)](#) and [Collado and colleagues \(Collado et al., 2015a, 2017\)](#) focusing on younger children. [Korukcu and Gulay Ogelman \(2015\)](#) establish a positive relationship between children environmental attitudes and liking by peers of 5–6-year olds in Turkey. Similarly, [Collado et al. \(2015a, 2017\)](#) identify a positive relationship between 6 and 12, and 9 to 13-year olds environmental attitudes and environmental behaviours. All other research in our review involving adolescents also note a positive relationship between environmental attitude and sustainable behaviours (e.g. [Lee, 2008](#); [Grønhøj & Thøgersen, 2012](#); [De Leeuw et al., 2015](#); [Robinson et al., 2019](#)).

Environmental Concern: Our review further uncovers ample evidence relating children environmental concern to sustainability (e.g.

[Easterling et al., 1995](#); [Lee, 2008](#); [Singh et al., 2020](#)). Environmental concern goes beyond awareness and attitudes towards the environment, to incorporate individual efforts towards problem solving ([Dunlap & Jones, 2002](#)). [Lee \(2008\)](#) establishes the degree of emotional involvement on environmental issues amongst adolescents, in Hong Kong, as a strong predictor of green purchase behaviour. [De Leeuw et al., \(2015\)](#) also study adolescents and note an indirect relationship between empathetic concern and sustainable behaviours, with research recognising individuals with empathetic concern to have a stronger connection with nature, and hence higher environmental attitudes ([Bragg, 1996](#); [Mayer & Frantz, 2004](#)). [Singh et al., \(2020\)](#) further establish that the environmental concern of Indian adolescents enable them to positively reverse-socialise their parents on sustainability.

Environmental Knowledge: Our study also recognises the relevance of environmental knowledge, or the level of information individuals [children] possess on environmental or ecological aspects ([Diamantopoulos et al., 2003](#)), for sustainable behaviours. Several studies establish the relationship between younger children (e.g. 3 – 7 years: [Spiteri, 2021](#); 6 – 11 years: [Soryte & Pakalniskiene, 2019](#)) and adolescents ([Donovan, 2016](#); [Singh et al., 2020](#); [Francis & Davis, 2015](#)) on environmental knowledge, and sustainability, across matters, ranging from climate change ([Trott, 2019](#)) to modes of transportation ([Borg et al., 2019](#)).

4.4. Interplay: socialisation agents and children characteristics

Our research identifies that the relationship between socialisation agents and children involves an interplay comprising family communication patterns ([Grønhøj & Thøgersen, 2012](#)), inter-generational transmission ([Jia & Yu, 2021](#)), socialisation and reverse socialisation ([Gentina & Muratore, 2012](#)). In particular, and consistent with consumer socialisation literature ([Ward, 1974](#); [Moschis & Churchill, 1978](#)), parents transmit environmental norms, values, awareness, attitudes, concern and knowledge to their children, through family communication patterns, inter-generational transmission, socialisation and resocialisation.

4.4.1. Family communication patterns

According to [Carlson & Grossbart \(1988\)](#), parents have different family communication patterns, also known as parenting styles, broadly be categorized as authoritative, neglecting, authoritarians and permissive. Authoritative (*responsive and demanding*) parents have the most defined expectations for children's development. Neglecting (*unresponsive and undemanding*) parents, are generally detached and adopt a laissez-faire attitude. Authoritarians (*unresponsive but demanding*) discourage communication, and do little to teach children how to adapt to outside influences. Permissive (*responsive but undemanding*) parents regard themselves as resources and want children exposed to the world with minimal interference. Through family communication patterns, parents dictate their level of authority in decisions [Carlson & Grossbart \(1988\)](#).

[Gentina and Muratore's \(2012\)](#) and [Grønhøj and Thøgersen's \(2012\)](#) research on family communication patterns identify that teenagers with warmer, more responsive, or autonomy supporting mothers, exhibit positive attitudes towards sustainable behaviours. [Bagan et al., \(2019\)](#) study younger children (4–7 years old), and establish that maternal support and control are strong predictors of children pro-social behavior. These findings confirm how family communication patterns impact children and sustainable behaviours. However, it is important to note how communication styles were assessed from the point of view of mothers only. Even if mothers are the ultimate recipient of influence attempts ([Flurry & Burns, 2005](#)), and are the primary socialization agents on pro-environmental matters ([Grønhøj & Thøgersen, 2009](#)), children behave differently with each parent. Both parents are heterogeneous and provide unique interaction with each child ([Kerrane & Hogg, 2013](#)).

4.4.2. Family/inter-generational transmission

Family or inter-generational transmission, as the transfer of information, beliefs, attitudes and behaviour between generations (Moore et al., 2002), represents an important way to establish environmentally conscious behaviours within children. Family transmission is relevant as children develop habits to behave sustainably from a young age. It is well established that several behaviours learnt in childhood are executed in adulthood (e.g. Ward, 1974, Moschis & Churchill, 1978; John, 1999). Similar to Moore et al.,'s (2017) study on the effect of inter-generational transmission of obesity, it is crucial to recognise the role of family transmission on children sustainable behaviour.

Our review traces the work of Carey et al., (2008) as the first paper, which identifies the presence of an 'inheritance factor' in the field of ethical family decision-making. According to Carey et al., (2008), sustainable or ethical family consumption is motivated by the birth of a child. As new mothers reconstruct their identities, they engage in new approaches to handle changes in the family. Carey et al., (2008) acknowledge ethical consumption as an important factor, which parents may have inherited from their own families, and hand over to future generations. Studies disclose the inter-generational transmission of parent environmental norms (e.g. Matthies et al., 2012; Ando et al., 2015; Collado et al., 2019), attitudes (Grønhoj & Thøgersen, 2012), concern (Meeusen, 2014; Casalo & Escario, 2016), values (Gong et al., 2021) and sustainable behaviour (Collado et al., 2017, 2019; Jia & Yu, 2021) to children. As children witness their parents' environmental actions (e.g. re-use, recycling, green purchases, energy conservation), they are inclined to act likewise (e.g. Grønhoj & Thøgersen, 2012; Matthies et al., 2012; Collado et al., 2019).

4.4.3. Socialisation

Our review further highlights the relevance of environmental socialisation. Environmental socialisation is a psychological learning process, children engage in direct response to *all* socialisation agents, to influence their environmental behaviours. Children raised in families with different communication patterns, acquire different values, learn alternative norms, roles, behaviours and consumer skills through different socialisation processes, and exert relevant influences on household decisions (Gentina & Muratore, 2012). Based on their level of environmental socialisation, children reflect their environmental citizenship through their psychological predispositions, influence their families' decision-making and engage in sustainable behaviours.

Consistent with Ward (1974), Moschis & Churchill (1978), and John (1999), children consumer learning occurs through observation, role-modelling and reinforcement processes, family members' social interaction, product and shopping experiences. Indeed, a significant part of children learning happens through exposure to, and observation of parents, teachers, friends' behaviours and the media. Such observation translates into children knowledge and behaviour modelling, which in turn is either positively, or negatively reinforced within the child's social environment. Environmental awareness acquired through education will direct children to reduce energy use or waste, engage in more recycling, or prefer walking to the use of cars (Grønhoj & Thøgersen, 2009). Grønhoj & Thøgersen (2012) identify adolescents' environmental behaviour as the direct outcome of shared environmental values, norms and attitudes within the family. Hawley (2018) and Colding et al., (2020) establish how children exposure to media such as augmented reality can be used for visualisation and promotion of positive relationships with nature.

4.4.4. Reverse socialisation

In addition, children harness the values, attitudes and knowledge they have acquired from multiple sources to reshape their families' psychological predispositions and behaviours, through the process of ecological resocialisation (Easterling et al., 1995). If a child learns about the detrimental effects of CO₂ emission from their teachers or educational programmes, they can pass this knowledge to their parents,

requesting them to limit the use of cars, or engage in more recycling. Alternately, children may factor in such considerations in their purchase requests to parents by favouring the use of second-hand clothing, furniture or toys. We highlight the concept of reverse socialisation, or resocialisation, as the process that occurs when children stimulate their parents' learning and involvement in green behaviours due to their environmental knowledge (e.g. Easterling et al., 1995). Socialisation is a bi-directional process, as parents and children attempt to influence each other by sharing standards of acceptable behaviours. Studies in our review (e.g. Gentina & Muratore, 2012; Gentina & Singh, 2015) establish the effects of environmental re-socialisation. Environmental values, norms, awareness, concerns, attitudes and knowledge motivate children to educate parents through ecological re-socialisation, impacting sustainable behaviours (Easterling et al., 1995).

As parents and children jointly learn about eco-friendly behaviours, we recognise that resistance may be encountered. As much as it is difficult for one individual to change his or her lifestyle, it is even harder to change an entire family's behaviour. As a social group, families involve complex negotiations and interactions (Cowan et al., 1984) as they navigate their ways through daily matters. Family communication patterns thus become central as parents and children play an active role in the socialisation and reverse socialisation processes (Easterling et al., 1995; Singh et al., 2020). The family as a unit, plays a crucial role in promoting children sustainable behaviour, as members influence each other.

4.5. Children sustainable behaviour

Our review identifies children sustainable behaviour as outcome. Outcomes refer to behaviours which occur as a result of exposure to multiple socialisation agents and resultant learning processes. We refer to children sustainable behaviour as green, environmentally safe, eco-friendly actions such as purchases, recycling, waste management and energy use, undertaken by children, or parents on behalf of, for, or together with their children, within the family, or surroundings, such as the local community. Children sustainable behaviour revolves around the adoption of fast fashion (Ritch, 2019), transportation modes (Waygood et al., 2019), energy (Zeiske et al., 2020), recycling and waste management (Schill et al., 2020; Uehara, 2020). As per this review, several socialisation agents, (family, media, exposure to nature, other stimuli, peers and education), interplay and contribute to children sustainable behaviour.

For instance, the use of a single mode of transportation, such as cars, for school trips, due to convenience, is likely to influence driving rather than walking, as a longer-term habit as children grow up. Being around peers who recycle or purchase sustainable fashion (e.g. made from recyclable materials and/or ethically sourced) is likely to engender similar behaviour from teenagers. Exposure to nature, through gardening, outdoor play, visits to green parks, the presence of businesses who provide ethically sourced, fair trade or organic products will presumably foster environmentally friendly purchases in children. An awareness of the factors leading up to climate change or creating marine pollution from the media or school, is equally likely to build children environmental knowledge and, prompt eco-friendly action. Sustainable behaviours also happen inside the home (e.g. energy, electricity, water conservation, recycling), and in more public places such as schools or the neighbourhood outside the home (e.g. littering, use of sustainable modes of transportation or fashion).

5. An organising framework of children sustainable behaviour

For a scientific and logical review, an organising framework is essential (Hulland & Houston, 2020). An organising framework is a structure used to guide the integration of features or themes from multiple literature streams (Lim et al., 2021). Accordingly, the core themes from the preceding discussions are synthesised into an

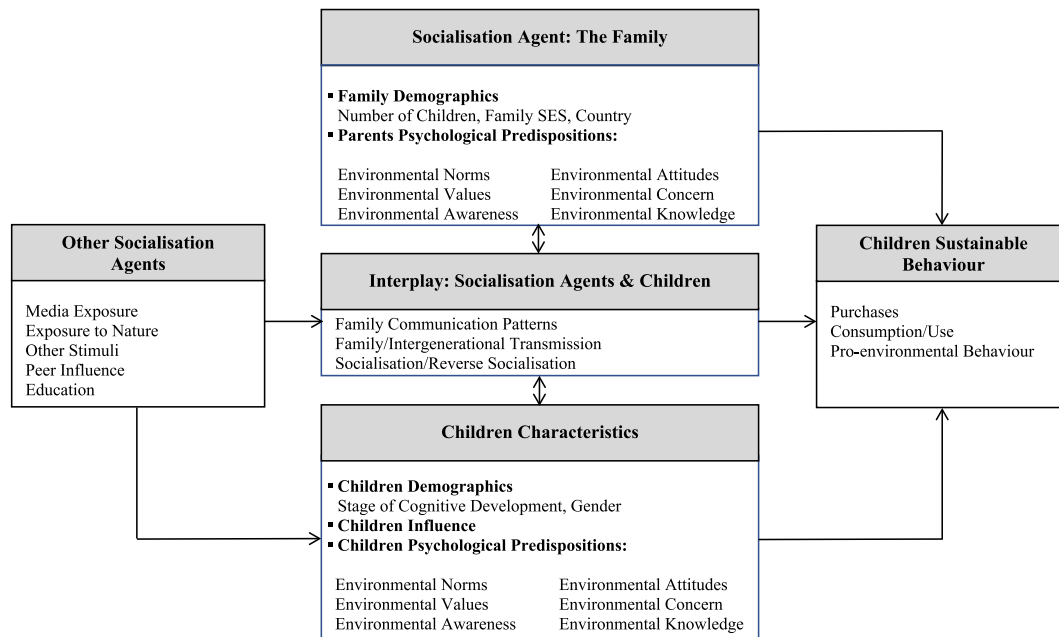


Fig. 3. Organising Framework on Children Sustainable Behaviour.

Table 3
Key Elements and Differences between the Current Paper and Easterling et al., (1995) Theorisations.

Study	Relevance	Underlying Theorisation	Key Elements	Key Differences
Easterling et al., (1995)	Children environmental consumerism	Consumer socialisation/ Resocialisation	<ul style="list-style-type: none"> Focuses on the role of children in families in promoting environmental consumerism, i.e. adoption and consumption of green products/ behaviours. Identifies cognitive status, exposure to nature, environmental concern, family communication, family resources (time, income, residential location), socialisation (peers, media & school) and ecological resocialisation as key determinants. 	<ul style="list-style-type: none"> Dated as one of the first attempts to theorise children sustainable behaviour. Adopts a narrative rather than systematic approach to identify and structure key literature. Omits important contextual factors, (e.g. family characteristics – SES, family size, country). Key parent and children psychological predispositions over looked. The relevance of intergenerational transmission ignored.
Current Paper	Children Sustainable Behaviour	Consumer socialisation/ Resocialisation	<ul style="list-style-type: none"> Considers a wide range of family characteristics including demographics and parents’ psychological predispositions. Discusses the relevance of multiple socialisation agents in line with traditional consumer socialisation theory (Ward, 1974; Moschis & Churchill, 1978). Integrates various children characteristics other than children concern; including demographics, children influence and psychological predispositions. Incorporates the interplay between the family and children towards sustainable behaviours. 	<ul style="list-style-type: none"> Adopts a systematic review methodology, using several keywords to identify relevant papers from multiple databases. Applies eligibility and inclusion criteria (see section 2.1) to identify most relevant papers. Themes derived from qualitative coding / analysis, and an organising framework of children sustainable behaviour suggested. Identifies research gaps and proposes multiple areas for future research.

organising framework of children sustainable behaviour (see Fig. 3). Since 1995, academic interest on children sustainable behaviour continues to rise (see Fig. 2). Children adopt sustainable behaviours like recycling, waste reduction and eco-friendly purchases due to multiple reasons. Our work identifies a range of themes, derived through a systematic review of the fragmented, and multi-disciplinary literature on children sustainable behaviour, using state of the art practices (Tranfield et al., 2003; Denyer & Tranfield, 2009; Snyder, 2019). Building on consumer socialisation as overarching theory (Ward, 1974), our framework encompasses the family, media exposure, exposure to nature, other (marketing and non-marketing) stimuli, peer influence and education as key drivers. Interactions or interplays through family communication patterns, inter-generational transmissions, socialisation

and re-socialisation processes, transmit environmental psychological predispositions leading to children sustainable behaviour. Notably, our proposed framework builds on the only, but dated theorisation of children sustainable behaviour. Easterling et al., (1995) make a fair attempt to conceptualise children sustainable behaviour, or rather ‘environmental consumerism’. However, their work portrays the school of thought prevalent in the 1990s, with the tendency to amalgamate prior research in a predominantly narrative review style. Such approach has inherent limitations including subjectivity, lack of transparency, cumbersome techniques and the exclusion of a wide range of relevant publications (Borenstein et al., 2009). Table 3 below summarises key elements and differences between Easterling et al. (1995) theorisations and the current paper.

Table 4
Future Research Areas.

Thematic Areas	Research Gaps	Research Questions
Role of Adolescent Environmental Activists	<ul style="list-style-type: none"> ■ No research investigates the effects of environmental activists on children environmental awareness, attitudes or behaviours. 	<ul style="list-style-type: none"> ■ Does environmental activism contribute to changing children psychological predispositions? ■ Can children relate more to, trust or attach more credibility to adolescent activists? ■ How can activists alter children environmental intention and behaviours, compared to their parents or school?
Impact of Social Media Influencers	<ul style="list-style-type: none"> ■ Our review does not identify studies which investigate the effects of social media and its related marketing elements such as influencers on children environmental behaviours. 	<ul style="list-style-type: none"> ■ What are the effects of celebrity endorsement and / or influencers on green behaviours? ■ What role does social media play in developing sustainable consumer skills?
Children Sustainable Habits	<ul style="list-style-type: none"> ■ Despite the relevance of habits to establish continuous sustainable behaviours, we did not identify research which study children habits. 	<ul style="list-style-type: none"> ■ How can children habits be modified to be more environmentally friendly? ■ What needs to be done to inculcate good habits into them from a young age?
Use of Alternative Theories	<ul style="list-style-type: none"> ■ Consumer socialisation/reverse socialisation remains the dominant theorisation in the field. 	<ul style="list-style-type: none"> ■ Can other theories such as practice, assemblage, and theory of planned behaviour explain what drives / upholds children sustainable behaviour?
Influence of Household Characteristics	<ul style="list-style-type: none"> ■ Existing studies assess the relationship between household characteristics and children sustainable behaviours in a fragmented manner. 	<ul style="list-style-type: none"> ■ Model future research on past studies to identify how household characteristics impact on sustainable children behaviour, e.g. Do parent characteristics, family categorisations (single vs blended vs two parent families, nuclear vs extended family, ethnicity); family size (e.g. no. of siblings) and family SES (parent occupation, parent education, income, family SES) predict children sustainable behaviours?
Socialisation Agents and Socialisation Processes	<ul style="list-style-type: none"> ■ Research on the effects of traditional socialisation agents, such as media, and peers on children sustainable behaviour is scarce. ■ There is limited evidence on the effects of packaging, branding and other marketing stimuli on children sustainable behaviour. 	<ul style="list-style-type: none"> ■ Further research should study the impact of socialisation agents and other marketing stimuli, e.g. do marketing stimuli such as labelling, pricing, promotional offers, and stage of purchase decision making process impact on children influence, influencing strategies, family decision-making and purchases of environmentally sustainable products? ■ How do socialisation agents in the context of green behaviours lead to advertising literacy, product and brand knowledge, purchase influence, decision-making abilities, orientations towards conspicuous consumption, materialism, and impulse purchases?
Alternative Methods: Experiments and Meta- Analysis	<ul style="list-style-type: none"> ■ A full assessment of the effects of environmental education on children sustainability was beyond the scope of this study. ■ Limited use of experiments, alternative forms of qualitative research and younger respondents as subjects 	<ul style="list-style-type: none"> ■ Given the number of studies investigating environmental education, we recommend a <i>meta</i>-analysis to integrate findings to date. ■ We further suggest the use of experiments to confirm causal effects between constructs on children sustainable behaviour. ■ We reinforce the need to use alternative research methods e.g. participatory research to involve younger respondents.
Overcoming Methodological Challenges in Researching Children	<ul style="list-style-type: none"> ■ Conducting research with children remains notoriously difficult due to their lower and constantly evolving mental or cognitive capabilities. ■ Going through the ethics review process is tedious. 	<ul style="list-style-type: none"> ■ We recommend the use of interactive stimulating materials, such as virtual reality, vignettes, participatory research techniques to delve further into children thinking on environmentally friendly matters relevant to marketers and researchers. ■ Researchers always need to consider children physical and emotional well-being, and gain voluntary consent from children and their parents.
Covid-19 Pandemic and Beyond	<ul style="list-style-type: none"> ■ Covid-19 has brought along a reduction in pollution due to restraints on activities. 	<ul style="list-style-type: none"> ■ How long can families and children sustain restricted travel and other activities? ■ Are children likely to sustain their current lifestyles to their adult years?

Our organising framework incorporates the family (demographics/ characteristics and parent psychological predispositions), media exposure, exposure to nature, other stimuli, peer influence and education as key socialisation agents (see sections 4.1 and 4.2). These socialisation agents convey messages and shape children environmental psychological predispositions in line with classic learning theories (e.g. Bandura, 1977). Our framework departs from Easterling et al., (1995) as we incorporate a range of environmental psychological predispositions such as awareness, attitudes, norms, values, concern and knowledge, which parents impart to their off-springs. Instead of family resources, portrayed as family time, money and residential location in Easterling et al., (1995), we consider a wider spectrum of family characteristic variables. We argue that family income, SES, size and geographical location (country) have a stronger influence on the family's ability to convey environmental psychological predispositions to their children. We consider exposure to nature as a socialisation agent, at par with others such as media exposure. Consistent with prior studies, children exposure to nature, through spending time at outdoor parks or green spaces, builds children to nature connectedness (Giusti et al., 2018) and shapes environmental knowledge (Melis et al., 2020). In the same way, advertising and media exposure builds advertising knowledge and shapes children minds (De Jans et al., 2019).

Through parent–child interplays, our review and organising framework construes socialisation and resocialisation as learning and interactive processes, designed to build children and their parents' environmental psychological predispositions rather than direct inputs as Easterling et al., (1995) advocate. We also consider family communication patterns as part of the interplays or interactions between parents and children. As per studies in our review, we complement family and children interplays through inter-generational transmission as an extra interaction to previous conceptualisation (Easterling et al., 1995). Through inter-generational transmission, parents act as role models, transmitting, directing and providing opportunities for their children to adopt environmental psychological predispositions (e.g. Matthies et al., 2012) and sustainable behaviours (e.g. Jia & Yu, 2021).

From a children characteristics point of view, our organising framework further reinforces that children sustainable behaviour goes beyond children's cognitive status and environmental concern as Easterling et al., (1995) advocate. Children influence, environmental awareness, values, attitudes, concerns, knowledge and norms play a consequential role. In fact, research even recognises how gender (see section 4.3) has an effect on children sustainable behaviour (e.g. De Leeuw et al., 2015). Our review also draws on White et al.,'s (2019) synthesis and analysis of generic research on sustainability. We complement White et al., (2019) work by focussing on children, an equally important segment from a theoretical (John, 1999; Williams et al., 2016; 2021), practical (Procter and Gamble, 2021) and policy perspective (UN 2015, SDGs). In particular, this paper contributes to the contemporary topic of Responsible Research in Business and Management (Haenlein et al., 2022) by focussing on children, an important component of society, and the planet.

6. A research agenda on children sustainable behaviour

This article systematically reviews and synthesises extant research on children sustainable behaviour. Analysis of the 80 papers in our sample, summarised in an organising framework (Fig. 3), explains children sustainable behaviour, through an interplay of family communication patterns, inter-generational transmission, socialisation and resocialisation, between the family, media, nature, marketing and non-marketing stimuli, peers, education and children. Research on children sustainability is on the rise, but the field remains fragmented and several gaps exist. We discern that consumer socialisation theory remains the key framework utilised to explain how children as consumers acquire environmental psychological dispositions, such as values, attitudes, knowledge and understanding from socialisation

agents. Nevertheless, the application of a single or dominant theory limits insights and hinders progress. Given the field of management's devotion to theory (Hambrick, 2007), alternative theoretical lenses are desirable to understand children sustainable behaviour. Similarly, the lack of experimental and longitudinal research - in the context of growing children and their on-going socialisation, restricts theoretical advancement.

A direct comparison of research on children sustainable behaviour, with the literature on children consumer behaviour reveals how research on sustainable behaviours remains ad hoc. Key differences in children regular consumption of food, toys and clothes versus sustainable options imply the need for research efforts to be targeted towards children and sustainability as a specific field of inquiry. Rather than the usual negotiations and bargaining tactics employed by children relative to purchase requests for more materialistic objects, children sustainable behaviour have an alternative effect on young developing minds (O'Neill & Buckley, 2018). Future studies need to streamline and reinvigorate efforts to investigate children sustainable behaviour as a core research theme, through for example, launching special issues on the topic, rather than as an overlay on general children consumer research, or even as a replication of research carried out with adult consumers. Accordingly, we present a set of future research areas (summarised in Table 4) to further advance knowledge.

6.1. Role of adolescent environmental activists

Stern (2000) classifies environmental behaviours into private and public spheres. Private activities, such as the purchase of environmentally friendly products, recycling, household waste management or energy conservation, happen covertly within households. Through the process of socialisation, private sphere activities impact directly on children environmental psychological predispositions and behaviours. Alternatively, public activities like activism, involve active involvement and display of environmental predispositions and behaviours in the public domain. Thus, while the effects of activism can take longer to manifest in the form of public policies (e.g. change in law for electric cars only from 2030; Gov.uk, 2020), they are more influential and impact a wider population.

One way the current generation is raising environmental awareness around the world, is through environmental activism. Activist and Nobel Peace Prize Nominee Greta Thunberg has led several demonstrations to sensitise the public and government towards environmental sustainability (La Jeunesse, 2019). Nevertheless, our review finds limited research addressing the impact of environmental activism on children and families' adoption of sustainable behaviours. Recently, Wildemeersch et al., (2021) conceptually explore the role of youth activism on sustainability, and acknowledge the lack of research on this topic. However, Wildemeersch et al., (2021) do not allude on how youth activism movements specifically impact children consumers and their families. In another study, Wallis & Loy (2021) examine the drivers of pro-environmental activism of young people aged between 13 and 25. Yet, further research is required to assess how, why and to what extent environmental activists can influence sustainable behaviours and contribute towards children environmental socialisation, across age groups, product categories and countries.

6.2. Impact of social media influencers

Closely related to activism is the concept of social media influencers. Social media influencers are online personalities with the ability to influence their followers through actions such as unboxing, using and/or reviewing products across one or more social media platforms (Lou & Yuan, 2019). With the widespread use of tablets, phones, computers and internet-enabled televisions, younger children and adolescents spend a tremendous amount of time watching their favourite influencers on YouTube. Ofcom (2020) reports YouTube as the preferred medium for

children between 5 and 15 years old. Additionally, platforms like Instagram are inundated with influencers, such as Greta, Thunberg, Immy Lucas and Blue Ollis, raising environmental awareness on sustainable fashion, zero-waste, veganism or plastic-free lifestyles (Heathman, 2020).

Our review does not identify any studies assessing children consumers exposure to environmental influencers, and/or any changes in their environmental intent, behaviours or their families' resocialisation towards sustainable behaviours. Thus, we propose that, in line with existing research on children consumer behaviour (e.g. Lou & Yuan, 2019; de Veirman et al., 2019), future studies should investigate the relevance of social media influencers in instigating children sustainable behaviour, socialisation and reverse socialisation, in both private and public spheres, across age groups, product categories and countries.

6.3. Children sustainable habits

Overall, our review establishes how several factors including children and parent psychological predispositions, children influence, family communication patterns, family transmission and other socialisation agents drive children sustainable behaviour. These factors allude to Stern's (2000) variables contributing to environmental behaviours. Indeed, we can equate Stern (2000), attitudinal (norms, beliefs, values, attitudes), contextual (interpersonal influences for communication and learning) and personal factors (social status and other sociodemographic variables) to parent and children psychological predispositions; children influence, family communication patterns, transmission; and household characteristics.

Stern (2000) fourth causal factor, habits, have not been explicitly studied in the context of children consumers. Habits are routines, or behaviours, so persistent that they become automatic over time, given the presence of cues. Recent research demonstrates the inclusion of some aspects of children habits in developing environmental sustainability. Halicka et al., (2021), for instance, show how children food preferences and habits, dictate parents' sustainable food purchases. Therefore, in line with the mainstream literature on environmental sustainability (White et al., 2019; Klockner, 2013), there is, a need to understand drivers behind children sustainable behaviours, penalties, prompts, intentions and incentives to facilitate environmental behaviours. There is scope to re-apply the consumer socialisation framework (Ward, 1974, Moschis & Churchill, 1978) to understand how children acquire and reinforce sustainable habits from their family, peers, media, school and the interaction between them, across age groups, product categories and countries.

6.4. Use of alternative theorisations

Our investigation reveals how consumer socialisation theory (Ward, 1974, Moschis & Churchill, 1978) remains the most popular applied framework to understand children sustainable behaviour. Other theories such as practice theory (Bourdieu, 1977; Schatzki, 1996) and assemblage theory (DeLanda, 2006; Deleuze & Guattari, 1987) offer alternative approaches to understand how families and children can adopt more innovative and environmentally friendly behaviours. Thomas & Epp (2019), use practice theory to understand how parents form new practices or habits due to childbirth. Epp & Velagaleti (2014) apply assemblage theory to study how daily contingencies lead to family tensions, and cause parents to trade-off between limited resources. Extending existing works (e.g. Martens, 2016), there is scope to further apply practice theory to understand children sustainable behaviour. Growing children are at a crucial stage of development, and as per practice theory (Bourdieu, 1977; Schatzki, 1996), their socialisation and (re)production of individual habits, norms, dispositions, values, lifestyles, may result in permanent preferences.

Social Cognitive Theory (Bandura, 1986) also provides a promising perspective to study children sustainable behaviour. Social Cognitive

Theory assumes that individuals have control over themselves and their surroundings. Phipps et al., (2013) exemplify how toy sharing libraries enable parents to rethink their personal, environmental and behavioural motivations to share rather than buy toys through important values such as environmentalism, and anti-consumption. This theory can also be applied to investigate children personal, environmental and behavioural factors towards sustainability.

There is also potential to further apply and extend existing theory such as Norm Activation Theory (Schwartz, 1977), Theory of Planned Behaviour (Ajzen, 1985), or the Value Belief Norm Theory (Stern, 2000) to model relationships between the first order categories (see Appendix 1) of our organising framework. For example, green values have a strong influence on consumer environmental attitudes (van Tonder et al., 2020) and concerns (Segev, 2015). Future research could combine Value Belief Norm Theory and the Theory of Planned Behaviour to establish the link between green values, norms, environmental attitudes, intentions and behaviours. Alternatively, research could test competing models to establish which theory is best at predicting sustainable behaviours.

Drawing on our framework, future studies may investigate the relationship between one or more parent, and/or children psychological predispositions, or their interplay between the child and his/her family. Additional research can also examine the relationship between positive children influence, or pester power of the child, and his/her family's materialistic orientations. Borrowing from White et al., (2019) conceptualisation of the adult consumer segment, the use of additional psychological constructs such as self-concept or self-efficacy on children respondents, and/or their parents can be assessed.

Similarly, there is a need to assess within families and children, the prevalence of the attitude/behaviour gap (Carrigan & Attalla, 2001; Carrington et al., 2010), a condition, where consumers consider themselves ethical, but do not materialise their attitudes into actual purchase behaviours. Stern (2000) value belief norm theory as an alternative, widely applied theoretical perspective in the mainstream environmental behaviour literature, can also be used to understand children sustainable behaviours. According to Stern (2000), if consumers [children] hold strong altruistic and biospheric values, they are more likely to accept the limits of the natural environment. Thus, consumers [children] are likely to recognise the importance of preserving the balance and integrity of nature and behave in a sustainable manner.

Equally, there is potential to apply Kohlberg (1976) stages of moral development as an alternative theoretical lens to gain insights into children thoughts of what is right or wrong - a key condition for ethical behaviour. According to Kohlberg (1976), children progress through three levels of moral reasoning: pre-conventional (under 9 years), conventional (9 to early teens) and post-conventional (early teens to adulthood). In the first stage, children consider the importance of rules, with failure to abide leading to punishment. The second stage relies on the idea of exchange. Children begin to realise that they can exchange behaviours for privileges, such as helping with housework, for pocket money. In the last stage, teenagers recognise their desires to be integrated in social groups and the impact of their actions on others such as the community. Thus, applying Kohlberg (1976) model will enable researchers to interpret children behaviours beyond the natural, developmental, age-related stages of cognitive development (Piaget, 1964), towards a moral perspective, highlighting the ethical relevance of children sustainable behaviour in the domain of ethical/moral decision making.

6.5. Influence of household characteristics

Altogether our review identifies approximately 20% of articles assessing the impact of some aspects of family demographics on children sustainable behaviour. Most of these studies are carried out with children from a range of age groups [e.g. 7 – 9 years (Mehdizadeh & Ermagun, 2020); 0 – 18 years (Waygood et al., 2019)]. However, in

contrast to generic research investigating the specific effects of household income, size, family type (single, versus dual versus blended), and parent employment status (Flurry, 2007; Kwai-Choi Lee et al., 2002), our review identifies fewer articles addressing the effects of family characteristics on children sustainable behaviour. Given changing family demographics, it is imperative for future studies to formally establish the relationship between family characteristics (e.g. number of parents, employment status, number of children, ethnicity) and children sustainable behaviours across age groups, product categories and countries.

6.6. Socialisation agents and socialisation processes

Back in the 1970s and 1980s, Moschis and Moore (e.g. Moore & Moschis, 1978, 1981, 1983; Moschis et al., 1984, 1986) studied the processes how children acquire general consumer skills, knowledge and attitudes. Using multiple cross-sectional and quantitative studies, Moschis and Moore demonstrate how advertising, media exposure, family characteristics and peer influence contribute towards children and adolescent advertising, product and brand, shopping, knowledge, consumer competence, decision-making skills and materialism (see Moschis & Moore, 1978; 1979; 1982; 1983; 1985). Moschis and Moore's works lay the foundations for research on children consumer behaviour and remain influential.

Our review, however, does not identify evidence for researchers and practitioners to ascertain whether exposure to green advertising and branding, related promotional offers and in-store/online marketing stimuli, or peer influence, lead to environmentally friendly behaviours among children. Similarly, little is known on whether children have a stronger influence on a particular type of green product (e.g. food versus toys versus environmentally friendly family car), or if such influence on their parents' decision making is stronger at a certain stage of the purchase process. As such, given the need for in-depth knowledge of the marketing and societal implications of sustainable marketing to children (Grønhoj & Bech-Larsen, 2010), investigating the influence of socialisation agents on children environmental behaviours represent critical avenues for future research. Additionally, there is a requirement to assess, in line with de Jans et al., (2019), the nature of children *para*-social interaction with influencers online compared to offline friends.

6.7. Alternative methods: experiments and meta-analysis

In this review, we did not consider the specific issues of environmental education for two main reasons. First, the extensive body of literature addressing aspects such as teacher effectiveness, school design, curriculum amongst others renders it relevant to pursue review paper(s) solely on these topics. Second, there are existing review papers integrating and synthesizing knowledge on environmental education (e.g. Rickinson, 2001; Jorgenson et al., 2019). However, given the substantial volume of research in the field, it remains relevant for future research to conduct *meta*-analysis on environmental education. Meta-analyses are inherently powerful as they allow researchers to statistically aggregate fragmented research findings from multiple, studies to establish conclusions (Lipsey & Wilson, 2001) and advance knowledge. Meta-analyses draw from many samples and parameters to resolve important conceptual, methodological and other substantive issues. They overcome one of the main limitations of research in marketing - the reliance on one or few studies. By drawing on a database of existing research, *meta*-analyses provide the best form of review (Grewal et al., 2018).

On a different level, this review shows a fair balance between

Table 5
Alternative Methods of Data Collection for Research with Children.

Method	Advantages	Limitations	Settings
Collect data from children in pairs or groups	Children may feel more at ease, natural, spontaneous and less compelled to find 'correct answers' (Graue & Walsh, 1998).	May lead to bias or desire for conformity within group members.	Conducting survey or collecting qualitative data in schools.
Use of interactive stimulus materials	Using materials such as films or virtual reality to ease parent & children understanding of what they are in for (France, 2004).	Costs of interactive materials.	Home & class environments.
Use of participatory research (Thomas & O'kane, 1998)	Use alternate forms of communication (stories, drawings or crafts) to engage children on complex matters breaks down power imbalances with grown-ups, by enabling children to take control.	Complexity of data interpretation.	Home & class environments.
Use of vignettes in qualitative and experimental research (Grønhoj & Bech-Larsen, 2010).	Expose respondents to identical scenarios, without eliciting the need to recall or reconstruct participant memories.	Risk of distorting respondent perspectives.	Suitable in online & offline settings.

Source: Summarised from Nairn & Clarke, (2012); Thomas and O'kane (1998); Grønhoj & Bech-Larsen, (2010).

quantitative and qualitative methodologies. Nevertheless, among the quantitative articles reviewed, we count few experiments. The quantitative studies in our review ascertain associations between constructs, or second-order knowledge (Rossiter, 2002), but fail to establish causal relationships, or third-order knowledge. Experiments (field and lab) offer researchers the possibility to assess the causal effect of interventions. Furthermore, well-designed and, executed experiments overcome most of the limitations linked to cross-sectional studies, and are increasingly popular in social science research (e.g. Viglia & Dolnicar, 2020). We recommend the use of experiments as a method to gain further insights into children sustainable attitudes, knowledge, habits and behaviours in the marketplace. Future lab studies can manipulate exposure to eco-friendly advertising, branding or promotions and assess their effects on children environmentally friendly behaviour, such as energy-saving, recycling and waste management. Virtual reality techniques can be utilised to prime young respondents in a fun and stimulating manners as per Smit et al.,'s (2021) recent study. Field experiments can investigate the provision of recycling equipment, energy saving devices, or school provision of outdoor activities on children uptake of sustainable behaviours.

6.8. Overcoming methodological challenges in researching children

Children are increasingly seen as active participants in research instead of objects of research (Barratt-Hacking et al., 2013). Yet, conducting research with children is notoriously challenging (Nairn & Clarke, 2012). As a result of their increasing influence in family

Table 6
Progress on Key Aspects of Children Sustainable Behaviour: Theory, Policy and Practice.

	Where were We? (1990s)	Where are We Now? (2022)	Where are We Going? (>2022)
Theory	<ul style="list-style-type: none"> ■ Limited studies in 1990s ■ Easterling et al., (1995) first propose a conceptual framework on children environmental ■ Consumerism 	<ul style="list-style-type: none"> ■ Wide body of fragmented, multi-disciplinary literature in an inherently complex field (see Web Appendix 2) ■ Lacks a relevant theorisation of children sustainable behaviour; Easterling et al. (1995) is dated 	<ul style="list-style-type: none"> ■ Our paper summarises and integrates extant research using state of the art guidelines (e.g. Snyder, 2019, Palmatier et al., 2018), identifies several knowledge gaps and puts forward areas for future research ■ Need for special issues (journals) and special sessions (conferences) to advance the field ■ Research on children as important segments of society, and the planet considered highly impactful (Haenlein et al., 2022) ■ Policy makers from all UN member nations race to achieve their 2030 targets ■ Action plans in place to help minimise waste, pollution, promote recycling, and support general sustainable development ■ Multiple national, international climate change initiatives, e.g. COP26 Glasgow 2021
Policy	<ul style="list-style-type: none"> ■ Nascent stage ■ The 1990s mark the decade of international commitments to sustainable development 	<ul style="list-style-type: none"> ■ 2008: Climate Change Act passed ■ 2015: Agreement by all UN member states to the 17 SDGs, of which, several impact children. SDGs acknowledge that i) waste and scarce resources will harm children future health and development, ii) widespread and positive societal changes begin with children ■ 2018: The Intergovernmental Panel on Climate Change (IPCC) warned that the Paris Agreement target of limiting temperature rises to 1.5C will be exceeded without reductions in carbon emission 	<ul style="list-style-type: none"> ■ Major environmental challenges remain ■ Technology is seen as a critical factor in reducing environmental impacts ■ Proliferation of game-style apps to involve children with sustainability (e.g. Gro Garden, Gro Recycling, Eco-Warriors and Namoo-Wonders of Plant Life) ■ Green Schools Project (2020) provide resources and support to schools to build children skills and aspirations towards sustainable living ■ Major behavioural changes are necessary to create lasting change towards a more sustainable society
Practice	<ul style="list-style-type: none"> ■ Practice of children sustainable behaviour in child friendly manners such as recycling and waste reduction 	<ul style="list-style-type: none"> ■ Thousands of kids join children activists and Fridays for Future sustainability movements, at the expense of full-time education, to demand action against climate change, urging governments to protect the environment and promote sustainable behaviours ■ Fast food chains (McDonalds & Burger King) are reducing single use plastic due to collectible toys ■ Procter and Gamble (2021) reports 90% of parents are influenced by their kids to be sustainable; they portray Luisa as the child who helps her family make choices to protect the planet ■ Unilever (Stewart, 2020) aims to work with 10 million young children and turn them into advocates for the environment ■ Supermarket Morrisons (2021), voted best in the UK for its work on the environment, uses children spokesperson, to communicate the importance of sustainability 	

purchases, marketers and researchers are still eager to hear children opinions ([Mayo & Nairn, 2009; Morrow 1999](#)). However, given their lower and ever-changing mental or cognitive capabilities, children are vulnerable and need protection. Research with young children requires specific ethical considerations ([Murray, 2016](#)). Ethical guidelines must be followed when using traditional and/or newer ways of collecting data (e.g. over the Internet). Researchers should consider children physical and emotional well-being, seek their' and their parents informed voluntary consent without any coercion ([Nairn & Clarke, 2012](#)).

Further to such methodological and ethical challenges, we note the increasing trend in the use of participatory techniques in our paper sample (e.g. [Donovan, 2016; Schill et al., 2020; Nasrabadi et al., 2021; Spiteri, 2021](#)) to ensure children are viewed as valued contributors are heard and protected ([Nairn & Clarke, 2012](#)). [Table 5](#) presents some methods to provide additional guidelines and reinforce current data collection practices with younger children (under 11). These approaches uphold the perspectives of [Graue & Walsh \(1998\)](#), positing that researchers need to acknowledge children usually are willing and capable of actively participating in research, provided, their physical and emotional well-beings are protected.

6.9. Covid-19 pandemic and beyond

Undoubtedly, Covid-19 has disrupted the socio-economic landscape. Family life and children are particularly impacted as work, schooling and socialising centralise within the home environment, and outdoor activities restrained. At the same time, but on a positive note, Covid-19 brought along a temporary reduction in pollution levels due to less travel (e.g. [The Guardian, 2020](#)). Alternatively, children suffer from education loss, reduced socialisation, increased anxiety and stress from staying at home ([UNICEF, 2020](#)). Childhood remains a critical stage of development, where attitudes, values and habits are developed.

Consistent with [He & Harris \(2020\)](#), we argue that there is a need to understand how children balance the need for ethical decision-making versus overconsumption and materialism. In fact, drawing from the mainstream literature, we acknowledge that consumers often act as a result of the situational factors impacting on the purchase process, product-specific issues or uncertainty about the best option ([Luchs et al., 2010; White et al., 2012](#)). Additionally, longitudinal research needs to address whether the so called 'Covid-19 generation' will develop their newly gained habits into more long-term, frugal and sustainable behaviours. Indeed, will green behaviours be transient, or will they fully take over the pleasure-seeking, hedonistic culture commonly associated with the younger generation?

7. Conclusions

Sustainability is topical (e.g. COP26 United Nations Climate Change Conference, 2021; Haenlein et al., 2022). Extending this concept to children is equally important, given their role in influencing their families' current behaviours and as future adults. Our study contributes to theoretical advancement by summarising, integrating, and structuring extant knowledge on children sustainable behaviour across multiple literature streams. In this review we bring together the fragmented literature, propose an enhanced conceptualisation of children sustainable behaviour and identify gaps in current theoretical understanding of the topic. This review offers a solid starting point for readers by providing a state-of-the-art treatise of the various theoretical and methodological considerations in the field. It serves as a prime, unique, and multi-disciplinary guide to the academic community by showcasing trends, theories, and practices of children sustainable behaviour. Additionally, the review proposes several avenues for future research, and acts as a guide to aid marketers, parents, educational institutions, and governments towards better decision-making.

From a practical point of view, major conglomerates such as The Lego Group, McCain, Burger King and McDonald's have been under pressure to engage in sustainability relative to children consumers. Sisters, Ella and Caitlin McEwan, aged nine and seven gathered a petition of >400 000 signatures against the use of plastic toys by fast food giants McDonald's and Burger King (BBC News, 2019). In response, Burger King (Today, 2019) and McDonald's (McDonald's 2020) altered their strategy on collectibles accompanying children meals. Burger King is contemplating a toyless future. McDonald's complement toys with books and online games, to promote reading from a young age, reduce single plastic-use and encourage younger audiences to cultivate healthy life-long habits. National television promote sustainability by convincing families with children to get onboard the eco mission through peak time broadcasts such as Shop Well for the Planet (BBC, 2021).

Our framework (Fig. 3) provides insights into how the family, peers, other stimuli or the media, amongst others, impart environmental attitudes, knowledge and skills to children. As such, practitioners and policy makers can use our study as a guide to consider relevant factors influencing children sustainable behaviour, thus directing responsible allocation of resources. An understanding of parents' psychological predispositions, or inter-generational transmission impacting on children behaviour can be portrayed in marketing communications strategies. The use of apps reducing food waste (e.g. OLIO) by giving it away for free, or at reduced prices from restaurants or supermarkets can be enhanced by profiling and targeting households with specific characteristics (BBC News, 2021). Exposing children to nature through sophisticated technological simulations, or virtual reality, in schools, other public places, movies, apps, or games, may foster their connection with nature and hence sustainability. Our recognition of education as a key contributor to children sustainable behaviour is crucial to warrant ongoing resource investment from policy makers, by way of eco-school buildings, outdoor classrooms, promotion of energy conservation or recycling.

We also offer a novel approach for review papers to summarise progress on a particular topic. Systematic literature reviews traditionally focus on theoretical advancement and often neglect the wider implications on policy and practice. In Table 6, we advocate that research should be summarised under Theory, Policy and Practice (TPP). We show progress on key aspects of TPP across three time periods: 1. Where were We? (1990s); 2. Where are We Now? (2022); 3. Where are We Going? (>2022).

Given the practical and policy implications of environmental sustainability, articles in our review focus on how children promote sustainable behaviours. However, we acknowledge that children may be opposed to the sustainability agenda. In reporting the narratives of secondary school students, Autio et al., (2009) remark that some children still prefer fast fashion, avoid recycling or organic purchases due to convenience. Wray-Lake et al., (2010) identify that children prefer to assign responsibility for the environment to the government and other consumers, rather than take personal ownership. Francis and Davis (2015), note how children raised concerns on cost, convenience, peer pressure and prioritised fun and pleasure, over sustainable behaviours. Horton et al. (2015) establish that children consider eco-friendly architectures to be weird, ugly and over the top, and want a greater participation in environmental planning.

In addition, although a rigorous methodology was employed to conduct this systematic literature review, our study has some limitations. First, a set of meaningful keywords was used in our protocol to extract relevant articles to address our research objectives. However, there is always the risk that potential articles could have been omitted as the selected keywords do not appear in paper titles, abstracts or keywords. Second, in this review we do not focus on publications addressing the specificities of children education like curriculum, school design and teacher training as they fall beyond the scope of this paper. Third, while its common practice to include research published in peer reviewed journals in systematic literature reviews, relevant works appearing in books or conference proceedings were not reviewed, potentially introducing publication bias (Kepes et al., 2012). Similarly, relevant papers from journals with impact factor less than 1.0 were excluded, given our stringent inclusion criteria (see section 2.1; Paul & Criado, 2020). Despite its limitations, our study suggests several future directions to establish children sustainable behaviour as a core research theme.

We hope our review inspires researchers, practitioners and policy makers to generate and sustain change on children sustainable behaviour, for the current and future generations. Indeed, as acknowledged by Greta Thunberg in her speech at the 2021 Youth4Climate Summit in Milan (McGrath, 2021), "*Of course, we can still turn this [climate change] around. It is entirely possible, it will take drastic annual emission cuts [action], unlike anything the world has ever seen ... Hope is not passive ... Hope is not blah, blah, blah*".

CRedit authorship contribution statement

Asheeb R. Shaheen Hosany: Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Sameer Hosany:** Writing – review & editing, Methodology, Conceptualization. **Hongwei He:** Writing – review & editing, Supervision, Project administration, Conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A

See Table A1.

Table A1
Coding Structure – Aggregate Themes.

Sample Papers	First Order Categories	Second Order Themes	Aggregate Theme
<ul style="list-style-type: none"> ■ Juvan et al., (2018) ■ Mehdizadeh & Ermagun (2020) ■ Duarte et al., (2017) ■ Casalo & Escario (2016) ■ Grønhoj (2006) ■ Gentina & Singh (2015) ■ Matthies et al., (2012) ■ Ando et al., (2015) ■ Collado et al., (2019) ■ Grønhoj & Thogersen (2009) ■ Gong et al., (2021) ■ Edwards et al., (2013) ■ Mehdizadeh & Ermagun (2020) ■ Halicka et al., (2021) ■ Grønhoj & Thogersen (2012) ■ Collado et al., (2017) ■ Evans et al., (2018) ■ Meeusen (2014) ■ Casalo & Escario (2016) 	<ul style="list-style-type: none"> ■ Presence of children ■ Family SES/Parent education ■ Country ■ Environmental norms ■ Household norms ■ Green consumption values ■ Environmental values ■ Environmental awareness ■ Parent or mum/dad environmental attitudes ■ Environmental concern ■ Organisation of daily life around sustainability ■ Altruistic concerns ■ Environmental knowledge 	<ul style="list-style-type: none"> Family Demographics Parent Psychological Pre-dispositions 	<ul style="list-style-type: none"> Socialisation Agent: The Family
<ul style="list-style-type: none"> ■ Ritch & Schroder (2012) ■ Halicka et al., (2021) ■ Edwards et al., 2013 ■ Colding et al., (2020) ■ Smit et al., (2021) ■ Barrera-Hernández et al. (2020) ■ Nasrabadi et al., (2021) ■ Edwards et al., (2013) ■ Schill et al., (2020) ■ Hadfield-Hill (2013) ■ Lee (2008) ■ Collado et al., (2017, 2019) ■ O’Neill & Buckley (2018) ■ Larsson et al. (2010) ■ Duarte et al., (2017) ■ Colding et al., (2020) ■ Svetina et al., (2013) ■ Collado et al., (2015b) ■ Duarte et al., (2017) ■ Collins (2015) ■ O’Neill & Buckley (2018) ■ Singh et al., (2020) 	<ul style="list-style-type: none"> ■ Exposure to digital technologies ■ Advertising ■ TV programmes ■ Time spent in nature ■ Presence of green spaces/outdoor facilities ■ Offers, labels ■ Brand awareness ■ Eco-friendly homes / schools ■ Peer pressure ■ Peer / best friend environmental behaviour ■ Educational school material ■ School building ■ Teaching 	<ul style="list-style-type: none"> Media Exposure Exposure to Nature Other Stimuli Peer Influence Education 	<ul style="list-style-type: none"> Other Socialisation Agents
<ul style="list-style-type: none"> ■ Wu (2018) ■ Balunde et al., (2020) 	<ul style="list-style-type: none"> Children: <ul style="list-style-type: none"> ■ Environmental norms ■ Personal norms ■ Subjective norms 	<ul style="list-style-type: none"> Children Demographics Children Psychological Pre-dispositions 	<ul style="list-style-type: none"> Children Characteristics
<ul style="list-style-type: none"> ■ Lee (2011) ■ Zeiske et al., (2020) ■ Wan Hussain et al., (2021) 	<ul style="list-style-type: none"> Children: <ul style="list-style-type: none"> ■ Environmental values ■ Altruistic values ■ Biospheric values ■ Egoistic values ■ Awareness of consequences ■ Environmental awareness ■ Children environmental attitudes 	<ul style="list-style-type: none"> Children Influence 	
<ul style="list-style-type: none"> ■ Donovan (2016) ■ Borg et al., (2019) ■ Grønhoj & Thogersen (2012) ■ Korukcu & Gulay Ogelman (2015) ■ Robinson et al., (2019) ■ De Leeuw et al., (2015) ■ Singh et al., (2020) 	<ul style="list-style-type: none"> Children: <ul style="list-style-type: none"> ■ Environmental concern ■ Empathetic concern 	<ul style="list-style-type: none"> Children Psychological Pre-dispositions 	
<ul style="list-style-type: none"> ■ Francis & Davis (2015) ■ Soryte & Pakalniskiene (2019) 	<ul style="list-style-type: none"> Children: <ul style="list-style-type: none"> ■ Environmental knowledge ■ Conceptualisation & understanding of sustainable behaviours ■ Family communication patterns ■ Parenting styles 	<ul style="list-style-type: none"> Family Communication Patterns 	<ul style="list-style-type: none"> Interplay: Socialisation Agents & Children Characteristics
<ul style="list-style-type: none"> ■ Gentina & Muratore (2012) ■ Grønhoj and Thogersen (2012) ■ Bagan et al., (2019) ■ Ando et al., (2015) ■ Collado et al., (2019) ■ Gong et al., (2021) ■ Jia & Yu (2021) ■ Easterling et al., (1995) 	<ul style="list-style-type: none"> ■ Family transmission ■ Inter-generational transmission ■ Socialisation 	<ul style="list-style-type: none"> Inter-generational Transmission 	

(continued on next page)

Table A1 (continued)

Sample Papers	First Order Categories	Second Order Themes	Aggregate Theme
<ul style="list-style-type: none"> ■ Gentina & Singh (2015) ■ Singh et al., (2020) ■ Ritch (2019) ■ Gentina & Muratore (2012) ■ Donovan (2016) ■ Easterling et al., (1995) ■ Carey et al., (2008) ■ Schill et al., (2020) 	<ul style="list-style-type: none"> ■ Resocialisation ■ Organic /eco-friendly Purchases 	<ul style="list-style-type: none"> Socialisation/Reverse Socialisation Purchases 	Children Sustainable Behaviour
<ul style="list-style-type: none"> ■ Waygood et al., (2019) ■ Zeiske et al., (2020) 	<ul style="list-style-type: none"> ■ Reduction in fast fashion ■ Green/Environmental consumerism ■ Ethical consumerism ■ Recycling/reusing ■ Waste reduction ■ Transportation modes ■ Energy conservation 	<ul style="list-style-type: none"> Consumption/Use Pro-environmental Behaviour 	

Appendix B

See Table A2.

Table A2
Selected Papers on Children Sustainable Behaviour, including aspects of Education (in Italics).

Selected Studies*	Main Focus
Larsson et al., (2010)	<ul style="list-style-type: none"> ■ Children are viewed as change agents and responsible parties towards sustainability. They are also considered as political actors, <i>given freedom, responsibility and educated to be more environmentally sustainable</i>; Children influence their own and their family consumption.
O’Neill & Buckley (2018)	<ul style="list-style-type: none"> ■ Assesses socio-structural factors that sustain green behaviours at home from students of <i>eco-friendly school</i>.
Ritch & Brownlie (2016)	<ul style="list-style-type: none"> ■ Identifies how sustainable behaviours are constructed via children and parents’ environmental concerns, <i>educational interventions</i> and peers.
Duarte et al., (2017)	<ul style="list-style-type: none"> ■ Investigates family socio-economic characteristics, peer influence, gender, culture in addition to school characteristics on environmental attitudes
Colding et al., (2020)	<ul style="list-style-type: none"> ■ Focuses on how the role of human nature connection in childhood is likely to lead to sustainable decision making in adults. <i>Education</i> is highlighted as one aspect, together with the role of identity environment fit and technology.
Hadfield-Hill (2013)	<ul style="list-style-type: none"> ■ Investigates children knowledge on sustainability in a sustainable community including <i>primary schools</i> and homes equipped with eco-technologies and how environmental behaviour is acted out in new spaces.
Halicka et al., (2021)	<ul style="list-style-type: none"> ■ Identifies school as one of the many contributors (e.g. parent knowledge, awareness, peers, packaging and media exposure) to sustainability.

* Papers in current review which cover Environmental education in addition to other factors; O’Neill & Buckley (2018), exceptionally and intentionally included due to its significant focus on positive pester power.

Appendix C

See Table A3.

Table A3
Methods in Use.

	No of Publications
Quantitative	
Survey	39
Experiment	3
Others (Scale Development & Actual food waste data)	2
Qualitative	
Interview	14
Focus Group	5
Others (e.g. Participatory Action Research, text narratives)	10
Conceptual	4
Mixed Methods	3

Appendix D. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jbusres.2022.04.008>.

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