



Review Children's Involvement in Research—A Review and Comparison with Service User Involvement in Health and Social Care

Clara Rübner Jørgensen

School of Education, University of Birmingham; Edgbaston, Birmingham B15 2TT, UK; c.joergensen@bham.ac.uk

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Abstract: Changing conceptions of children and childhood have in the last three decades led to the increasing participation of children in social research and their involvement in active research roles. However, the benefits and challenges of this process are rarely discussed in relation to the wider literature on adult involvement, thus missing an opportunity to learn from potential commonalities or differences. In this paper, I argue for an explicit comparison between children's involvement in research and (adult) service user involvement in health and social care research. The paper presents findings from a review of children's involvement in research, first separately, and second, in comparison with themes from the literature on service user involvement. As the paper will illustrate, many of the themes manifest themselves in similar ways in the two areas of practice, leaving scope for the development of cross-disciplinary practice, reflection and conceptual development. Particular suggestions deriving from the paper are (a) a strengthening of organisational frameworks within Higher Education institutions to facilitate the involvement of diverse groups of children in research, (b) the development of a more systematic mechanism for reporting the involvement of children and young people in research and (c) cross-disciplinary and theoretical exploration of key concepts such as power and empowerment within the involvement context.

Keywords: children's involvement; children's rights; power; methods; ethics; service user involvement

1. Introduction

In the last three decades, there has been a significant increase in the participation and involvement of children in research. Often drawing on the principles set down in the UN Convention of the Rights of Children (UNCRC) in 1989, researchers from a wide range of disciplines have argued for the importance of exploring the lived experiences of children and young people and their own perspectives on issues pertaining to their lives. Most frequently, this has involved recruiting children and young people as research subjects, but a growing number of studies have also involved children in more active research roles (Cuevas-Parra and Tisdall 2019).

Parallel to the increasing involvement of children and young people in research, another development has taken place within health and social care research; that of involving (mainly adult) service users in research projects or organisations. The practice of 'service user involvement' or 'Patient and Public Involvement (PPI)' has grown significantly internationally over the last 20–30 years (Supple et al. 2015) and in the UK, service user involvement is now often a mandatory requirement to obtain funding for major health and social care research projects. Researchers are increasingly involving service users and carers in different stages of their research, including the proposal stage, research design, data collection, analysis and dissemination (e.g., Barber et al. 2011; Howe et al. 2017; Mockford et al. 2016).

Several similarities can be found in the literature reporting on the involvement of children and service users, and many of the same challenges are also described in both. To some extent, the two areas of work are bridged by studies that discuss the involvement of young service users in research (Bird et al. 2013; Kirby et al. 2003; McLaughlin 2005), but these tend focus on the specific benefits and challenges of involving young people in health research, rather than any commonalities or differences with adult service user involvement. There is a lack of explicit comparisons between the two areas of work and this misses the opportunity to (1) practically explore whether reflections on involvement in one context could be used to develop or improve involvement practices in the other and (2) conceptually and empirically further our understanding of children's involvement by comparing the way dilemmas and challenges are approached in the literature on both areas of practice.

In this paper, the lack of comparison between children's involvement and service user involvement is addressed, first, by providing a review of the key themes, challenges and dilemmas of children's involvement in research, and second, by comparing them with insights from the literature on service user involvement. While it is acknowledged that service users may both be adults and children, the comparative material will be drawn from the literature on adult service user involvement and, in the remainder of the paper, the term 'service user involvement' will be used to refer to the involvement of adult service users. Drawing on findings from the review and the subsequent comparison, the discussion and conclusion critically consider what can be learned from comparing children's involvement with service user involvement and suggest a number of areas for practical and conceptual development.

2. Background

In the last three decades, new ways of understanding childhood and children have developed, often labelled by the term 'new social studies of childhood' (Skelton 2007). As part of this, children are now generally acknowledged as competent social actors, with experiences, understandings and ideas of their own (Christensen and James 2008; Kellett et al. 2004; O'Kane 2008; Prout 2005; Wyness 2015), as subjects rather than objects (Kellett 2005; Horgan 2017) and as 'experts' in their own lives (Clark and Statham 2005). Consequently, it has been argued that they should be consulted on matters of importance to them and, within research, this has been reflected in the growing participation and involvement of children in a wide range of disciplines, including education (Dalli and Te One 2012; Devine 2002), development (Crivello et al. 2009), migration studies (Sime and Fox 2015; Tyrell 2001), human geography (Barker and Weller 2003; Horton and Kraftl 2018) and health and social care (Bergström et al. 2010; Vis et al. 2011).

Children's participation is 'fairly broadly conceptualised' (Holland et al. 2010, p. 361), and is commonly used to describe a wide range of activities and roles, ranging from children acting as research subjects to them taking on more active research roles, for example as co- or peer-researchers. The focus of this paper will be on the latter type of activities, which will be referred to as 'involvement' as opposed to 'participation.' However, as noted by Bird et al. (2013) and supported by the present review, there is a lack of consistency in the terminology of involvement within childhood research. 'Involvement' is frequently conflated with 'participation', and researchers use a range of terms to describe the children they work with, including co-researchers (Bergström et al. 2010; Bradbury-Jones and Taylor 2015; Lundy et al. 2011), active researchers (e.g., Kellett 2005; Kellett 2010) and peer researchers (Thomson et al. 2015). Research involving children is described as 'participatory research' (Crivello et al. 2009; Flewitt et al. 2018), 'pupil-led research' (Burton et al. 2010), and 'child-led research' (Lomax 2012) amongst other terms. Furthermore, children's roles in a research project may overlap, as for example in Gray and Winter's (2011) study where children were both research subjects and advisors. In this paper, involvement activities are defined as those that include people (children and service users) taking part in research advisory or steering groups, advising on research topics or design, carrying out data collection and analysis, and/or taking part in dissemination. The review only discusses the parts of the selected papers that describe the involvement of children in these types of activities.

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A few parallels have been drawn between children's involvement and the involvement of other (adult) groups in research, particularly with reference to feminist and minority ethnic researchers (Alderson 2001; Coppock 2011; Kellett 2005). However, these have predominantly focused on the general or moral rationale for actively involving the people being studied, rather than any practical comparisons. In addition, a debate about the nature of childhood in relation to adulthood in the context of research has been conducted, with researchers discussing whether or not specific child-friendly research methods should be adopted (Christensen and James 2008; Morrow 2008; Punch 2002). This debate has mostly focused on children's participation in general, rather than specifically on involvement.

Within health literature, Kirby's (2004) guidelines on involving children and young people in health and social care research briefly acknowledges that many of the issues raised in this type of work are similar to those found within the involvement of adult service users. A few health and social care researchers who have worked with young service users, similarly make reference to the user involvement agenda (e.g., Mawn et al. 2016; McLaughlin 2005; Oliver et al. 2015), but seldom position their work in relation to the experiences of adult service users and the researchers involving them. In general, children are relatively absent from the literature on service user involvement (Bird et al. 2013) and vice versa. The most explicit comparison is Tisdall's (2012) discussion of childhood and disability studies, in which she calls for a 'move away from the dichotomies of adulthood versus childhood' and for welcoming 'insights from other academic areas, such as disability studies' (p. 188).

The dichotomous division of children and adults is increasingly challenged within childhood studies, where, for example, Wyness (2013) has noted the importance of 'bringing back' adults into the conversation about children's participation. In a critical discussion of the central tenets of childhood studies, Hammersley (2017) has argued that the idea of studying children in their own right is problematic not only because they, as a group, are very diverse, but also because much of the variation between them 'reflect characteristics that they share with adults' (p. 116). Rosen (in Spyrou 2018) has suggested that inter-generational conversations, for example between childhood studies and feminism, may help further 'new approaches for activism and academia.' (p. 435). Similarly, Spyrou (2018) and Spyrou et al. (2018a) have called for a shift away from viewing children as independent units of analysis and argued that childhood studies need to overcome its 'child-centredness and inward-looking gaze (Spyrou et al. 2018a, p. 8).

Following this line of argument and addressing the above-mentioned gaps, the present paper seeks to bridge some of the dichotomies between children and adults and different areas of work by explicitly comparing key themes found in the literature on children's involvement with insights from the involvement of service users.

3. Methods

For the review of children's involvement in research, an initial search was conducted in Google scholar, using *children's involvement in research* as a search term. However, this search was complicated by the inconsistent use of terminology in the literature, which meant that the search returned a very large amount of papers, of which most were not relevant as they discussed children as research subjects (rather than active co-researchers or advisors). Consequently, four more specific search terms were developed: *children as co-researchers, children as researchers, participatory research with children*, and *peer-led research by children*. Using these terms, a search was conducted in the Web of Science, ERIC and Scopus. Papers were included if they described projects which involved children up to the age of 18 (as specified in the papers or deduced from the context) as co-researchers or advisors (as per the definition of involvement described above) or position papers about the practice of involving children. Only peer-reviewed literature in English was included, and, in the case of research papers, only those discussing work conducted in the UK were selected. This was because it was believed that the involvement of children may vary from country to country and because the objective was to compare findings with insights from the literature on service user involvement mainly from the UK,

where a lot of the literature originates (Boote et al. 2015) and where the author had worked within the field for a number of years. Articles published between 1989 and 2018 were included, with 1989 set as the starting point, as this was the year of the ratification of the UNCRC and thus seen as a key year for children's involvement.

The database search resulted in the identification of 22 papers. Following this, a secondary search was carried out by reviewing the reference lists of the selected papers and by browsing the online library of publications provided by the British national organisation for public involvement in health and social care research (INVOLVE). This resulted in the identification of an additional 18 papers. For details of the search strategy and selected papers, see Figure 1.

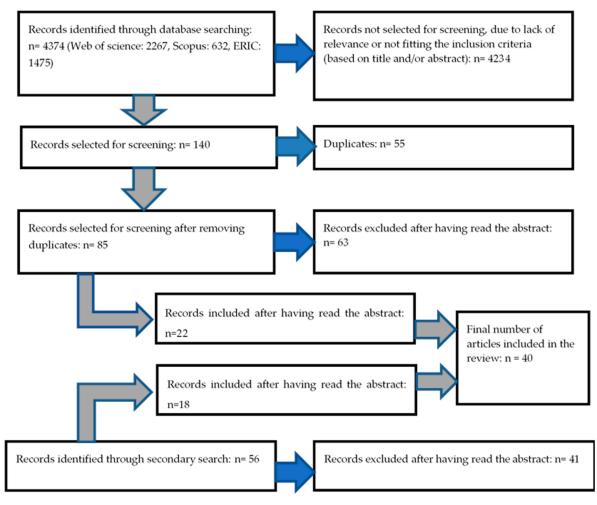


Figure 1. Prisma Flow Diagram.

The 40 papers were read in full and analysed using a thematic framework. Emerging themes were grouped and labelled, first using very broad categories and later more refined and nuanced themes. This process resulted in the identification of 6 key themes. In what follows, these are discussed first separately, and second, in comparison to findings from selected literature on service user involvement. For an outline of the papers, see Table 1.

Author and Year	Type of Paper	Topic/Project	Participants, Selection and Process of Consent	Methods of Involving Children	Stage of Involvement
Alderson (2001)	Review article	Children working as researchers.	n/a	n/a	n/a
Bailey et al. (2015)	Review article	The involvement of disabled children in research.	n/a	n/a	n/a
Bird et al. (2013)	Discussion article	Collaboration with children in health research.	n/a	n/a	n/a
Bradbury-Jones and Taylor (2015)	Discussion article	Involving children as co-researchers.	n/a	n/a	n/a
Burton et al. (2010)	Research article	Children's participation in pupil-led research.	Two whole Year 5 classes selected by head teachers. Process of consent not specified.	Interactive training/discussion workshops.	Selection of topics and methods, data collection via questionnaires, analysis and dissemination.
Clark (2004)	Research article	Action learning with young carers.	Young carers recruited through the researcher's employing organisation. Process of consent not specified.	Methods for involvement not specified.	Steering group members. Co-researchers.
Clavering and McLaughlin (2010)	Review article	Children's inclusion in health-related research.	n/a	n/a	n/a
Coad and Evans (2007)	Discussion and research article	Framework for involving children and young people in data analysis.	Case 1: Advisory group: A group of children (aged 10–16). Peer interviewers: 12 children (eight girls and four boys of diverse ethnic origin). Selection process not specified. Consent provided by the children. Case 2: Six young people (aged 12–21) from Barnardo's Yorkshire Young People's Research Group. Selection and consent not specified.	Case 1: Training events. Reading of transcripts and analysis using post-its and boards. Case 2: Questionnaires, drama and photography workshops, observation and interviews.	Case 1: Design, verification and piloting of interview guide, data analysis. Case 2: Development of research questions, methods and instruments. Data collection.
Coppock (2011)	Research article	Evaluation of an emotional literacy project.	Year 6 children from two schools (school A: peer researchers, school B: interviewees). Access through head teachers and parents. Consent from parents and children.	Focus group meetings using participatory techniques. Peer interviews, using demonstrations and open questions.	Development of research themes and methods, peer interviews, data analysis.
Cox and Robinson-Pant (2008)	Research paper	Children' role in classroom and school decision making.	Children from six primary schools (Year 1–6). The whole class working in mixed ability groups. Selection of classes and consent procedures not specified.	Action research workshops for teachers, research activities using interactive and visual techniques for small group and whole class work. Regular progress meetings.	Data collection. Data analysis. Dissemination at a children's conference.

Table 1. List of papers included in the review.

Table 1. Cont.

Author and Year	Type of Paper	Topic/Project	Participants, Selection and Process of Consent	Methods of Involving Children	Stage of Involvement
Dunn (2015)	Research paper	Children's views on using popular culture to teach writing in the primary classroom.	Eight children from two Year 3 classes from two primary schools. Selected by teachers. Consent obtained from schools, parents and children.	Three sessions, using circle time, a puppet as an indirect way of communicating, photography and sorting exercises.	Advisory group. Deciding on methods. Data analysis and interpretations.
Fleming et al. (2009)	Research article	The involvement of peer evaluators of the Leicester teenage pregnancy strategy.	Seven young people (six women/one man, 17–19 years old) recruited via flyers distributed by youth workers and agencies. Applied using a form. Consent obtained from the peer evaluators.	Four training sessions. Interviews and focus group sessions, using interactive discussion techniques. Presentation of findings at University.	Development of methods. Data collection with young people. Development of questions for adult participants. Analysis. Dissemination.
Flewitt et al. (2018)	Research article	Participatory research project with hard-to-reach young people.	Youth Expert Panel: Eight young people (15–18 years) who had previously conducted research with the partner organization. Self-selected. Consent not specified. Participatory research: 30 volunteers (7–18 years old) recruited through partner organisations. Consent obtained from children and parents/guardians.	Five meetings with the Youth Expert Panel. Format not specified. Participatory research: 45–90 min workshop with participants, using a range of interactive and visual activities.	Youth Expert panel: Considering the overall project aims and ideas, approach to content, methods and ethical framework. Participants: Training (incl. concept development and data collection methods), data collection and dissemination.
Franks (2011)	Discussion article	Participatory research with child researchers.	Drawing on two participative studies, one involving young refugees. No particular information given about participants, selection or consent.	Not specified.	Training in questionnaires, question design and interviews and getting their input on the questionnaires and interview questions. Data analysis.
Gaillard et al. (2018)	Review article	The involvement of children and young people in clinical research.	n/a	n/a	n/a
Gray and Winter (2011)	Research article	Children's views on their daily experiences in their preschool setting.	36 children (18 boys and 18 girls), 3–4 years of age, from four preschool settings, and 18 of them had a disability. Consent obtained from parents and from children via child-friendly approaches.	Short sessions with pairs of children (one with and one without a disability). Methods not specified.	Chose the topic and research question, selected the research methods, gathered the data and disseminated their findings.

Table 1. Cont.

Author and Year	Type of Paper	Topic/Project	Participants, Selection and Process of Consent	Methods of Involving Children	Stage of Involvement
Hooper and Gunn (2014)	Research article	Developing a local authority pledge on young people in care.	A core of eight young people (14 involved at one time or another). Recruited from existing participation groups and through other looked after young people. Consent procedures not specified.	Young people's working groups meetings. Peer interviews.	Decisions on how to conduct project and spend budget. Development of activity-based consultation and dissemination material.
James (2007)	Discussion article	Children's voice, including the role as co-researchers.	n/a	n/a	n/a
Kellett (2010)	Discussion article	Children as active researchers.	Includes an original research study by an 11-year-old girl.	Training of children in research methods and support in carrying out their own projects.	Development of methods. Data collection. Dissemination.
Kellett et al. (2010)	Research article	Participation of young people with learning disabilities in decision-making forums.	Six young people (aged 14–19) with learning disabilities, who were members of a charity's volunteering programme.	Four weekends of training using interactive and participatory methods. Peer interviews and observations.	Scoping the project. Data collection and analysis. Dissemination.
Kim (2016)	Discussion article	Research by children.	n/a	n/a	n/a
Kim (2017)	Research article	Primary school children doing their own research.	Eight children (mixed ability and mixed age 8–11). Selected by head teacher and the classroom teacher. Consent procedure not specified.	22 weekly after-school sessions over six months. Training provided by teachers. Questionnaires.	Selection of research topic and methods. Data collection. Dissemination.
Leitch et al. (2007)	Research article	Consulting Pupils on the Assessment of their Learning (CPAL).	Students recruited from six schools. Advisory group invited randomly from a list of students. Consent obtained from teachers.	Classroom observations, video-recording, and drawings.	Research advisory groups. Data collection and analysis.
Lomax (2012)	Research article	Children's experiences of living in a disadvantaged neighbourhood.	13 children (seven boys and six girls) aged 8–12 years. Invited through an out-of school play scheme.	Child-led interviews. Creative visual methods, including video interviews and photo portraits.	Deciding on research questions and methods. Data collection.
Lomax (2015)	Research article	Ethical responsibilities in participatory visual research with children and young people.	Project A: 14 children and young people (age 8–14). Project B: Eight children (age 3–10) and their families. Selection and consent procedures not specified.	Project A: Production of film. Project B: Interviews with parents, drawings, photography included in a film.	Project A: Defined the research questions, data collection and dissemination. Project B: Data collection and dissemination.
Lundy and McEvoy (2012)	Research article	What does an explicit rights-informed approach mean for research with children?	Each project had an advisory group with eight children (aged 10–12). Recruitment and consent procedures not specified.	Advisory group meetings and capacity-building sessions, using participatory methods.	Advice on research process, tools and methods. Data analysis.

Author and Year	Type of Paper	Topic/Project	Participants, Selection and Process of Consent	Methods of Involving Children	Stage of Involvement
Lundy et al. (2011)	Research article	An explicit rights-informed approach to engaging children as co-researchers.	Each advisory group: Four Year 1 children (aged 4–5, mixed gender and ethnicity). Selection procedure not specified. Continuous verbal consent sought from children.	Capacity-building activities with the children, using images to stimulate discussion.	Development of research questions, methods, data interpretation and dissemination.
Mawn et al. (2016)	Research article	Young people's involvement in mental health research.	Young people (14–24 years old) recruited through mental health charities and organizations. Informed consent from all participants.	Semi-structured interviews with participants.	Consultation on data analysis.
McLaughlin (2005)	Discussion article	The involvement of young service users in research.	n/a	n/a	n/a
Messiou (2014)	Research paper	Working with students as co-researchers.	School 1: Five girls and four boys from Year 9. School 2: Five boys and two girls from Year 8. Selected by members of school staff. Consent procedure not specified.	Two workshops, discussing the topic, research methods and data analysis. Creative methods and questionnaires used for data collection.	Data collection. Dissemination.
Murray (2006)	Research article	Peer-led focus groups.	Young people aged 14–18, recruited through snowball sampling and a local school. Consent from young people and parents.	Training in conducting focus groups. Peer-led focus groups.	Data collection.
Oliver et al. (2015)	Research article	Involving young people in a systematic review.	A group of young people (aged 12–17) from a national children's centre.	Focus group, using post-it notes and sorting activities.	Verifying data analysis from systematic review.
O'Brien and Moules (2007)	Research article	Reflective participatory research with children and young people.	Children aged 7–13 recruited through local schools (school council or selected by head. teacher). Consent from young people and parents.	Training workshops and 'fun days', using role play, mapping and participatory exercises.	Recruitment of research officer, identification of training needs, data collection and dissemination.
Pearson and Howe (2017)	Research article	Pupils involved the redesign of their school playground.	2–3 volunteers from three year groups (Years 3–6) selected by school staff. Consent was obtained from all pupils.	Research team meeting.	Two children took part in the research team, which collected, analysed and disseminated data.
Sime (2008)	Research article	Issues of involving children and young people living in poverty in participatory research.	Pre-proposal meeting: 10 children (10–14 years). Advisory group: Five young people, identified through existing contacts with a charity.	Planning meeting and six-monthly advisory group meetings.	Informing researchers about young people's views, methods of data collection, recruitment strategies, etc.
Smith et al. (2002)	Research article	The involvement of young people as co-researchers.	Phase 1: 38 young people recruited through existing projects run by The Children's Society and other organizations. Phase 2: 64 young people.	Phase 1: Consultation, development, training and data analysis. Phase 2: Planning and carrying out additional phases of the research.	Planning the research, organising and facilitating training, fieldwork and analysing findings.

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Author and Year	Type of Paper	Topic/Project	Participants, Selection and Process of Consent	Methods of Involving Children	Stage of Involvement
Taylor et al. (2014)	Research paper	Young people's experiences of going missing from care.	Two young people collaborated with the researchers as peer researchers.	Training of peer researchers. Focus group interviews facilitated by the peer researchers.	Data collection and analysis.
Tisdall (2012)	Discussion article	Children's participation as researchers and disability research.	n/a	n/a	n/a
Willumsen et al. (2014)	Discussion article	Moral and epistemological issues in involving children as co-researchers.	n/a	n/a	n/a
Yanar et al. (2016)	Research article	Ethical tensions in participatory action research with children and young people.	12 young women from East London. Recruitment and consent procedures not specified.	Focus groups.	Development of research aims, questions and methods. Data collection, analysis and dissemination of findings.

The literature on service user involvement was not systematically selected or reviewed to the same extent as the literature on children's involvement in research, for two main reasons: First, it was perceived to be out of scope to include findings from two reviews in the same article and as several reviews (including systematic reviews) have already been conducted in the field of service user involvement (e.g., Boote et al. 2015; Brett et al. 2014) it was decided to draw on these rather than conduct a new and separate review. Second, a more systematic review on the literature on service user involvement was not considered necessary for the purpose of the paper, as the focus was to compare key themes in the literature on children's involvement with insights from service user involvement, and not vice versa. The comparative sections thus do not suggest that the themes discussed are the only themes of relevance in service user involvement, but rather that the themes found in the review of children's involvement may have parallels in the literature on involving service users.

All elements of the review were carried out solely by the author of this paper, including the definition of inclusion/exclusion criteria, the selection of papers and the analytical development of the themes. While it is acknowledged that it could have been useful to involve an additional team member to verify decisions and co-construct the themes, the selection of papers followed a clear definition of the activities which qualified as 'involvement', and specified the age group of the children, the country of origin of the research and the type of publication (peer-reviewed journal articles). The selection process was thus relatively unambiguous. In addition, in the development of the review, the author drew on over 10 years of experience of working in parallel within the fields of children's participation and service user involvement, previous reviews on a similar scale with colleagues (e.g., Jørgensen et al. 2017a) and an extensive background in qualitative research, including thematic analysis.

4. Review Findings

4.1. Theme 1: Rationale for Involving Children in Research

Kim (2016) has identified two broad types of rationales for research by children—normative (it is their right and it empowers children) and methodological (children are both competent and better positioned to do research with other children than adults). These correspond well with the types of motivations found in the review. Many of the reviewed papers described children's involvement as a matter of 'rights' and 'respect' (Bradbury-Jones and Taylor 2015; Kellett et al. 2010; Lundy and McEvoy 2012) and some specifically related their work to Article 12 and 13 in the UNCRC (Dunn 2015; Leitch et al. 2007; O'Brien and Moules 2007), defining children as 'right's holders' with an entitlement to be engaged in the research process (Lundy et al. 2011; Lundy and McEvoy 2012).

The literature also emphasised the positive and empowering effect of children's involvement, particularly in terms of increased confidence and self-esteem (Bailey et al. 2015; Clark 2004; Fleming et al. 2009) and development of skills (Alderson 2001; Bradbury-Jones and Taylor 2015; Burton et al. 2010; Coppock 2011; Kellett 2010). Skills gained through involvement included research specific skills, transferable skills, such as project management, communication and presentation skills, decision making and negotiation (Fleming et al. 2009; Gaillard et al. 2018), and social skills, gained by having increased responsibility, independence and opportunities to socialise and work in groups with peers and adults (Bailey et al. 2015; Fleming et al. 2009; Gaillard et al. 2018). This was seen by Kellett (2010) to potentially contribute to a 'virtuous circle' whereby confidence and self-esteem generated through involvement resulted in children and young people also taking a more active role in other areas of their lives. Involvement was furthermore reported to encourage trust and relationship building, facilitate child and adult partnerships and help change power relations between children and adults (Clavering and McLaughlin 2010; Coad and Evans 2007; Kellett et al. 2010). Finally, being able to add experiences to curricula vitae and application forms were seen as a way to ensure that involvement was meaningful from the perspective of the involved children and gave them opportunities for personal development (Gaillard et al. 2018; Mawn et al. 2016).

Methodological motivations for involving children centred on four main themes. First, it was argued that children have superior and primary knowledge when it comes to their own lives (O'Brien and Moules 2007) and therefore offer valuable and broader insights, perspectives and interpretations (Lomax 2012; Lundy and McEvoy 2012; Taylor et al. 2014), which may be different to the adults around them (Fleming et al. 2009; Pearson and Howe 2017). Involving children in the different stages of research was described as a means to obtain a greater understanding of their perspectives and identify and prioritize more appropriate topics and questions (Bailey et al. 2015; Bradbury-Jones and Taylor 2015; Clavering and McLaughlin 2010; Franks 2011; Gray and Winter 2011). Furthermore, involvement was seen as a way to generate more insightful research, grounded in children's perspectives and experiences (Alderson 2001), ultimately improving the quality and relevance of the research (Clark 2004; Oliver et al. 2015; Smith et al. 2002). A specific example was provided by Messiou (2014) who showed how secondary school children helped identify issues around safety, bullying and seating arrangements at their schools, and Cox and Robinson-Pant (2008) who described how primary school children's involvement in a school-based research project taught teachers about their viewpoints and helped them transform their practice by challenging previously held assumptions.

The second methodological rationale described was that children's involvement in research helped develop the specific methods and research tools. Franks (2011) for example found that children helped make questionnaires more sensitive due to their 'valuable cultural knowledge, linguistic and other forms of knowledge that the researcher may lack' (p. 6). In a study of 'hard-to-reach' young people, Flewitt et al. (2018) showed how the youth expert panel advised the research team to use creative approaches, such as storytelling and visual material, and age-appropriate language in their work with other children. Other researchers have described the specific benefits of involving young people as peer researchers, who create a different interview dynamics due to their particular insights and common experiences (Fleming et al. 2009; Messiou 2014; Murray 2006; Taylor et al. 2014).

Third, and further building on the idea of commonality between child researchers and research participants, involving children was described as a mean to access other children, who may be reluctant to speak to adults (Fleming et al. 2009; McLaughlin 2005). Yanar et al. (2016) provided a specific example of this, as they described how a group of young female peer researchers were 'extremely effective at engaging what are often referred to as "hard to reach" young people' (p. 124).

A final methodological theme discussed was the potential impact of children's involvement on dissemination. This was seen as a way to ensure that children took part in decisions about which findings to share (Flewitt et al. 2018) and as a powerful way to attract public attention and generate more interest in the findings (Yanar et al. 2016). Involving children in dissemination was seen as potentially having a greater impact on audiences and also assisting in bridging gaps between children and adults (Gaillard et al. 2018).

4.2. Theme 2: Power and Research Relationships

Involving children in research was described in several of the reviewed papers as a way to address or minimize power imbalances between children and adults, but researchers also warned of the risks of tokenism if involvement activities were shaped by an adult agenda or if the children were not listened to (Bailey et al. 2015; Bird et al. 2013; Dunn 2015; Hooper and Gunn 2014; Lomax 2012; McLaughlin 2005; Sime 2008). As acknowledged by Alderson (2001) and Clavering and McLaughlin (2010), working with child researchers in itself does not resolve problems of power. To counter these, Smith et al. (2002) emphasised the importance of clearly communicating research aims and objectives to young co-researchers and actively involving them in all stages, and Alderson (2001) pointed out that methods needs to be carefully planned, tested, evaluated and developed with children. Kellett (2010) furthermore identified the importance of a comprehensive programme of training to address power differences and research relationships between children and adults.

Various degrees of control were assigned to children in the described projects. Hooper and Gunn (2014) acted as consultants with no control over project decisions, and Murray (2006) recruited young people to conduct focus groups without her being present. Several authors, however, took a greater role in the described projects and placed the ultimate responsibility for the research with the adult researchers (Bradbury Jones and Taylor 2015), arguing that it is not always feasible or ethical to give a child full control of a project (Burton et al. 2010; Willumsen et al. 2014). Lomax (2015) described how sharing decisions with children can lead to disagreements and based on her specific case, which included the production of a film, she argued that decision making with regards to dissemination needs to be carefully balanced with the (adult) researchers' responsibility to co-researchers. Willumsen et al. (2014) questioned whether the term 'co-researcher' can be applied to children at all, as it signals too much responsibility over the research process and outcomes and may force children into making ethical and moral decisions for which they are not prepared.

These findings show the importance of considering power relations between children and adults throughout projects involving children but also that these vary significantly depending on the project and the context in which it is conducted. Involving children may not only be about taking power away from adults, but rather changing the relationships between the two (O'Brien and Moules 2007) and as recognized by Kellett et al. (2010) children often need the support of adults to carry out their research and disseminating it via platforms they might find difficult to access (e.g., government agencies). It may thus be conducive to consider power differences more broadly as an element of research relationships.

Research relationships between the different actors in the research process was a reoccurring theme in the literature on children's involvement. Several of the reviewed papers mentioned the need for time and resources for the different stakeholders in the project to get to know each other (Coad and Evans 2007), with some, like Dunn (2015), building this into training or group meetings at the beginning of the project. Hooper and Gunn (2014) described how they built their research around the young people's existing relationships, 'allowing emotional care through friendship or supportive relationships to be offered through and beyond the project' (p. 481). Others reported on how relationships between the adult researchers and the involved children developed and were consolidated through the research (Flewitt et al. 2018). Emphasising the importance of research relationships, Coad and Evans (2007) advocated training for adults in facilitating partnership work with children.

Other research relationships were also discussed in the literature, particularly in papers reporting on work carried out in schools, where competing agendas and practices may be at play. In Kim's work (Kim 2017), for example, the head teacher tried to steer the children towards certain topics and, while this was not ideal, she found it difficult to intervene as the head teacher was also the main gatekeeper to the children. Cox and Robinson-Pant (2008) described teachers' concern with 'anarchy' and the belief that their educational, legal and moral commitments and duties of care obliged them to take 'ultimate responsibility for decisions' (p. 461), thus limiting the children's input. They also argued that the teachers were caught between their own commitment to inclusion and participation and the demand for performance and productivity required of schools. Flewitt et al. (2018) described a similar tension and questioned whether a participatory research design with its deliberately 'adaptive, provisional and ambivalent' characteristics can be embraced within the current school focus on outcomes and performativity (p. 384). Extending on the point of external pressures, a number of papers also discussed the power of funders or universities and the wider contexts within which researchers work (Franks 2011; Leitch et al. 2007), often requiring detailed plans that do not leave much scope for children to develop ideas through the project and seldom providing funding for the initial stages where children are contacted and the research shared with them (Alderson 2001).

4.3. Theme 3: Ethics

The ethical dilemmas posed by children's perceived vulnerability and researchers' responsibility to protect them was a reoccurring theme in the literature, which, as argued by Clavering and McLaughlin

(2010), may lead researchers to being conservative in their involvement of children. Dunn (2015) acknowledged the conflict between seeing children as competent, on the one hand, and vulnerable, on the other, but also argued that it is possible to respect both. Hooper and Gunn (2014) furthermore noted that the contradictions between children having their views heard and protecting their well-being are highly contextual.

In most of the reviewed papers, adults were required to consent for children. Sime (2008) argued that this reflects a view of children as innocent and in need of protection and denies their consent as valid in itself. Many studies, however, also asked children for their consent, but specific descriptions of the consent procedures for the involved children were rare.

The principle of research anonymity was discussed in the literature, with Lomax (2015) and others showing how these may conflict with children's own preferences. Yanar et al. (2016) argued that the requirement for children to be anonymous is unjust and disempowering as it limits their ability to show pride in the work they have done. Confidentiality also arose as a theme, with Murray (2006) stressing the importance of emphasising confidentiality between involved children, covering the risks of over-disclosure in training, and providing the opportunity for de-briefings after research activities. Some of the papers furthermore discussed the possibility that the research process might bring up memories or be upsetting for the involved children, emphasising the importance of preparation, debriefing (Mawn et al. 2016; Taylor et al. 2014) and appropriate child protection protocols and referral mechanisms (Bradbury-Jones and Taylor 2015; Smith et al. 2002).

4.4. Theme 4: Competence and Skills

One of the key challenges of children's involvement in research was, according to Bradbury-Jones and Taylor (2015), the common view amongst researchers that children are not competent to conduct their own research. Children were also reported to sometimes worry themselves that they lacked the competence to get involved (Mawn et al. 2016). Researchers who had involved children however generally argued that rather than being a question of competence, involvement depended on research training or capacity building (Coad and Evans 2007; Lundy et al. 2011) and that 'the skills needed to undertake research ... are not synonymous with being an adult, they are synonymous with being a researcher, and most researchers undergo some kind of formal training (Kellett 2010, p. 197).

The assumption that children are experts in their own lives and as such are involved to provide a 'lay perspective', however, raised questions around the role of training, and several researchers mentioned the view that training beyond certain standards may alter children's views, put them at risk of being accused for being too 'professionalised' and alienate other children who will see them as different (Mawn et al. 2016; Tisdall 2012). Responding to this, Smith et al. (2002) have argued that any simplistic assumptions about 'participatory researchers knowing their field in advance' are unwise (p. 196). Furthermore, Alderson (2001) have argued that all inexperienced researchers have training needs, and Bradbury-Jones and Taylor (2015) that it would be amoral not to prepare children for their role.

Many of the empirical studies identified through the review included an element of training. Some described particular training programmes undertaken as part of a particular project (Kellett 2010; Kim 2017; Taylor et al. 2014) others focused on training for particular parts of a research project, e.g., concept/theme development (Dunn 2015) or data analysis (Coad and Evans 2007). In addition, it was agreed that children needed to be taught about and have a basic understanding of confidentiality and ethics (Coad and Evans 2007). Bespoke training programmes developed or adapted to a particular project were the most common, even though training in more generic research skills, as argued by Kellett (2010), would perhaps be more effective toward children driving their own research agendas.

4.5. Theme 5: Children as 'Insider' Researchers

Children's position as 'insiders' is a common rationale for involving them in research, but as discussed in several of the reviewed articles, this begs the important question of who can be considered a 'peer' or an 'insider' and in what context? Acknowledging that children are 'experts in their own lives' does not necessarily mean that they are experts in other children's lives (Tisdall 2012), nor that they can be seen as representatives of all children (Coppock 2011). Illustrating this, Oliver et al. (2015) mentioned that the young people they involved in a systematic review of obesity and attainment were not themselves obese and this could have influenced their views on the findings. Several of the reviewed papers criticised the idea of a universal 'child voice' (Lomax 2012), which was seen to create a too-simplified dichotomy of childhood versus adulthood, and neglect the diversity of children's perspectives (James 2007; Kellett et al. 2010). Alternative voices (e.g., of minority ethnic children, disabled children) were being reported as often missing from research (Clavering and McLaughlin 2010; Gray and Winter 2011). The question of recruitment and selection was emphasised in several of the reviewed papers (Lomax 2012; Sime 2008), and it was acknowledged that the privileging of any sub-group challenged ideas of fairness and representativeness (Leitch et al. 2007) and risked becoming another 'marker of childhood inequity and inequality' (Kim 2016, p. 235). In addition, the dangers of a vocal and articulate few monopolising or 'hijacking' the research agenda was described as a concern (Kellett 2010; Kellett et al. 2010).

Smith et al. (2002) discussed the power relations between young people and writing specifically about peer-led focus groups, Murray (2006) warned of the potential power imbalances arising within the groups, particularly if one young person was chosen as the peer leader. However, peer leaders may not always be the ones in a position of power, as illustrated by Pearson and Howe (2017) who showed how children involved as co-researchers reported that other children had sometimes shouted and interrupted research team meetings. It was acknowledged that when giving child co-researchers the responsibility for collecting data, such power dynamics are not always identified and, consequently, the researcher may not know whose voices are heard and whose are omitted (Willumsen et al. 2014). As Lomax (2012) suggested, there is thus a need for 'a critical focus on the ways in which children may drive and shape research and the ways this may be unequally experienced by individual children during the research process' (p. 114).

The position as 'insider' can furthermore be difficult to balance with the researcher role. Franks (2011) noted that 'peers' may not be considered peers anymore when taking on the interviewer role, and that interviewees did not always want to talk to child interviewers, as they worried about them not being able to maintain confidentiality. In addition, Coad and Evans (2007) argued that children sometimes find it hard to be objective and while Alderson (2001) acknowledged that shared knowledge can be an advantage, she also mentioned that child researchers may overidentify with interviewees and assume they understand too much, leading them to take replies for granted and lose their 'enquiring outsider' stance (p. 140). Messiou (2014) furthermore described how certain expectations of co-researchers built up amongst research participants who wanted co-researchers to deal with their difficulties. In her case, this issue was enhanced because the co-researchers were older than the research participants, again emphasising the power differences amongst children and that the term 'insider' should be approached with caution.

4.6. Theme 6: Practical and Structural Considerations

Practical and structural considerations were described as significant barriers to children's involvement in several of the reviewed articles. 11 articles reported on work carried out in schools and this was described as posing particular challenges, as previously mentioned with regards to potentially competing agendas, but also in relation to the negotiation of access, recruitment and selection (Leitch et al. 2007; Messiou 2014). In seven of the 11 papers, it was specified that selection was carried out by school staff, with associated implications for diversity. Although accessing children through schools may be considered the easiest and sometimes the only option for researchers (O'Brien and

Moules 2007), Sime (2008) thus argues that it also involves compromises 'in terms of including in research any children that 'fit' the sample descriptions and excluding others' (p. 69).

While some projects purposively included young people who had prior knowledge, experience and/or interest in the topic being studied (e.g., mental health difficulties in Mawn et al.'s (2016) study) others had less specific requirements. Nevertheless, researchers often reported difficulties in recruiting diverse groups (Sime 2008). Smith et al. (2002) noted that the task of recruitment is particularly challenging when working with 'transient and possibly alienated' groups, such as young people on the margins of society (p. 195). They, and others, also pointed out the challenges of retaining those who had agreed to participate, emphasising the importance of sustaining engagement and keeping children informed on progress (Gaillard et al. 2018; Sime 2008).

Another element of access was the extent to which meetings and activities promoted the active involvement of children. Kellett et al. (2010) outlined a range of problems pointed out by young people attending research meetings, including that people speak too fast, that minutes are not sent out in advance, that the words used are too 'big', and that meetings are often scheduled straight after school when children are hungry and tired. The time that children can realistically be expected to spend on a given research project may also limit their contribution and level of involvement (Sime 2008) and other commitments (such as school) were mentioned as an additional challenge, as children are generally not available during the day (Gaillard et al. 2018; Mawn et al. 2016).

The time it took to involve children was described in several of the papers as significant, due to the processes of recruiting and properly preparing young researchers for their role in the project, the personal and practical support needed by young researchers whilst undertaking the research, and the administration involved (Fleming et al. 2009; McLaughlin 2005; Sime 2008). To facilitate successful involvement, researchers need time (Bailey et al. 2015; Messiou 2014), and a lack may result in children and young people not being involved in all aspects of the research (Pearson and Howe 2017). However, Murray (2006) also mentioned that involving peer researchers may save time, for example in recruiting or retaining participants or transcribing the data.

A final practical consideration mentioned in the literature was the decision about remuneration or payments (Bradbury-Jones and Taylor 2015; Mawn et al. 2016). Direct payments to children are contentious (Coad and Evans 2007) and practically difficult if co-researchers are under the age of 14 (Tisdall 2012). Much thus depends on the age of the involved children and while a few of the studies included monetary remuneration (Coad and Evans 2007; Fleming et al. 2009; Smith et al. 2002), many used vouchers as an alternative (Franks 2011; Gaillard et al. 2018; Murray 2006; Sime 2008). Projects generally covered children's transport costs and in the case of Smith et al.'s study (2002) which involved young parents, also crèche facilities. Smith et al. (2002) estimated that project budgets must be inflated by around 10 percent to allow for the direct costs of involving young people as co-researchers and furthermore added that there will be additional indirect costs in terms of extra time allocations for the research project as a whole.

5. Comparison with Service User Involvement

The six key themes identified in the review of children's involvement in research have shown that the process of involvement is both rewarding and challenging. The literature often presents both benefits and barriers as unique or special to the involvement of children, but there are, as the following will show, many important overlaps with the literature on service user involvement which illustrate the potential for discussing practical challenges to meaningful involvement more broadly, and engaging in conceptual development of key concepts across disciplines.

The literature reviewed described normative and methodological reasons for involving children in research and emphasised ideas about empowerment, children's rights, their unique position as 'insiders' and their potential for improving methods, research design and selected topics. In a review of service user involvement, Shippee et al. (2015) identify similar motivations including 'a moral/ethical drive to empower lay participants' and a more 'consequentialist' reasoning, which focuses on optimizing validity, design, applicability and dissemination of the research (p. 1152). The democratic or emancipatory approach to user involvement identified by Beresford (2002) closely resembles the normative rationale for children's involvement with its emphasis on participation and people 'being able to speak and act on their own behalf' (p. 97).

A number of reviews of user involvement have evidenced specific methodological benefits similar to the ones identified in the literature on involving children, including: providing different insights, making sure findings are useful for patients and carers, and eliciting better information from study participants (Ashcroft et al. 2016; Brett et al. 2014). In addition, studies have shown that adult service users, similar to children and young people involved in research, may benefit by developing new skills, confidence and social relations (Barber et al. 2011). Even though children's involvement is often described with reference to the UNCRC and the new sociology of childhood, these similarities thus illustrate that the benefits and motivations of involvement extend and are relatively similar to research with adults.

Critical commentators of children's involvement however have noted that both moral and epistemological motivations need more evidence and justification. Willumsen et al. (2014), in particular have argued that the ambition of researchers may sometimes be more prevalent than their interest in 'providing valid knowledge, thus blurring the goal of enquiry and the role of researcher' (p. 343). In addition, Kim (2016) has critically emphasised that the assumptions concerning children's competency and the advantages of their involvement are 'a little romanticised', and in need for more empirical evidence. However, as noted by Bird et al. (2013), the gathering of evidence is made difficult by the lack of consistent reporting mechanisms. This is supported by the present review, which illustrated significant variation in the information provided by researchers. In the literature on service user involvement a similar debate about 'impact' has taken place (see for example Gillard et al. 2010 and Jørgensen et al. 2017b), and authors have argued for a more systematic reporting of the process and outcomes of involving service users in research. Staniszewska et al. (2011, 2017) have developed a checklist (the Guidance for Reporting Involvement of Patients and the Public (GRIPP) checklist), which encourages researchers to systematically document the aims, methods and outcomes of involving service users in their research projects, and also include practical information, for example about costs. Drawing on this, and extending Bird et al.'s (2013) recommendation for improved reporting of work involving young service users, a similar measure could be adopted to address some of the inconsistencies in terminology and reporting of children's involvement, and provide a more systematic and empirical evidence base of its benefits and challenges.

Power and research relationships was another key theme in the literature on children's involvement, where power differences between children and adults due to age have been widely discussed. Power may operate along many dimensions and issues of power differences, tokenistic and 'tick box' user involvement have also been described extensively in the literature on service user involvement (Howe et al. 2017; Ocloo and Matthews 2016; Supple et al. 2015), along with problems of researchers devaluing the input of service users and being reluctant to 'hand over control' of the research (Brett et al. 2014). However, both bodies of literature seem to be dominated by a particular understanding of power. In the context of participatory research with children, Gallagher (2008) has noted that power is generally conceptualised as a 'commodity' 'possessed by certain groups (e.g., adults) and not by others (e.g., children)' (p. 140) and this notion of power is also prevalent in the field of service user involvement (see for example Hanley 2005). Not much attention is given to the different levels, dimensions, characteristics and domains of power, identified by a string of social theorists (for a useful outline and commentary, see for example Haugaard 2002).

The importance of partnership working, trust, communication and relationships established over time has been described as key to the effective involvement of both service users (Howe et al. 2017; Barber et al. 2011; McKeown et al. 2010) and children. However, there are some differences in the structural barriers to partnership working described in the two bodies of literature. In the context of service user involvement, Green (2016) has argued that there remains unequal power dynamics

between the scientific research community and the public. In the literature on children's involvement, the structural power barriers most commonly described were in relation to schools and school staff, rather than the research community. Both bodies of literature, however, identified a tension between participatory approaches and the more rigid approaches of funders, reflecting a more general challenge of conflicting research paradigms.

Ethics was a key concern for researchers involving children, illustrating the generally held concern that children are vulnerable and in need of protection. This view of children is clearly different than the perception most commonly held of adult service users, and some of the ethical concerns around consent, for example, were different in that service users generally can provide consent for themselves, whereas children often need consent from parents. Other ethical issues were however similar. For example, in line with Murray's concern about confidentiality in focus groups led by young peers (2006), Brett et al. (2014) discussed that service users may also be anxious about how information discussed in meetings will be treated by the other service user participants. This shows some of the common concerns when people (both children and adults) are involved on the basis of personal and sometimes sensitive experiences and emphasises that vulnerability is not confined to childhood.

The question of competence and skills was discussed extensively in the literature on children's involvement in research, and authors generally recommended training for children to take up their research roles. Training is also often offered to service users as a preparation for involvement (see for example Mockford et al. 2016) and as a way to address diversity and representation (Jørgensen et al. 2016). However, training of service users is a more contentious issue (Jørgensen et al. 2016; Dudley et al. 2015) than training of children, illustrating some of the differences in perceptions about competence and skills noted above. The UK Social Care Institute of Excellence states that 'there is a balance to be struck between ensuring users and carers receive appropriate training and preventing their contributions becoming over professionalised' (SCIE 2009). The same dilemma was described in the literature on children's involvement, but with much less emphasis. Drawing on the debate within service user involvement, researchers involving children might however benefit from considering more consistently whether and how children's position is affected by substantial training, illustrating the potential of considering training practices across disciplines.

The issue of training is closely related to the fourth theme identified in the review—the question of who is an insider and in what context? This is a theme which has equal relevance in the involvement of service users. For example, in assessing the impact of peer interviewers on the process of the interview, it is important to critically consider other characteristics, besides the one(s) the peer interviewers have in common with their interviewees (Jørgensen et al. 2017b). Diversity within service user involvement groups is a well reported issue (Branfield 2009; Brett et al. 2014) and the lack of recruitment from marginalised groups a general problem (Green 2016; Omeni et al. 2014). INVOLVE has emphasised the importance of ensuring that involvement is open to all without discrimination (INVOLVE 2015) but similar to the involvement of children, this may be difficult to achieve. The risk of certain groups being overrepresented and consequently, their problems being over-emphasized in the research agenda (Brett et al. 2014) is an area of concern in both types of literature. Furthermore, the question of how to balance being an 'inside lay representative' with taking up research responsibilities is also prominent in the service user involvement literature, where authors have commented on the dangers of particular individuals being over-utilised, professionalised and hence losing their lay perspectives. The issue of over-utilization of particular individuals has not been raised to the same extent in the literature on child involvement, perhaps due to the previously mentioned lack of attention to children's diverse experiences or the transient nature of many children's groups. The general dilemmas posed by recruiting lay researchers, the questions of how their lay perspective is retained, and the potential risks of overrepresentation of particular groups, however, are important in all types of involvement.

Finally, the practical considerations around time, recruitment, access and payments were a prevalent theme in the literature on children's involvement and have, similarly been identified as one of the main challenges of service user involvement (Domecq et al. 2014). In both bodies of

literature, it is acknowledged that good involvement requires time and resources. Many universities and health institutions have set up organisations for the involvement of service users in health and social care research (e.g., the University/User Teaching and Research Action Partnership (UNTRAP) at the University of Warwick, Comensus at the University of Central Lancashire, and PenPIG at the University of Exeter). However, in educational research, children are often recruited through schools, with the previously discussed implications. Organisational support for involvement is one way to enhance diversity, representation and independence of institutional recruitment strategies (Jørgensen et al. 2016; Jørgensen et al. 2018). One potential recommendation from the comparison between the two types of literature, could thus be to increasingly develop children's involvement groups within universities, independently of schools, which could be drawn upon for involvement opportunities and which could involve a dedicated person to support both children and researchers in how best to work in partnership. This could potentially help address some of the barriers to involvement, e.g., issues of marginalisation in meetings and research activities, identified by Kellett's youth group (Kellett et al. 2010), and in the literature on service user involvement (Ashcroft et al. 2016; Barber et al. 2011). It could help deal with the practical issue of payment/remuneration for involvement, which has been identified as problematic in both contexts, albeit for different reasons. Finally, it could provide a forum for relationships and trust to develop over time, and a mechanism for more systematic debriefing and reporting of child involvement activities.

6. Discussion and Conclusions

The many common themes and challenges identified in the comparison between children's involvement in research and service user involvement, presented in this paper, illustrate that there is good potential for practical and conceptual development across the two disciplines. While this has relevance to both disciplines, this concluding discussion focuses specifically on the ways in which children's involvement may benefit from more explicitly drawing on insights from service user involvement, and how the comparison may be used to reflect more broadly on key theoretical concepts within childhood studies.

At the practical level, a number of common structural barriers to involvement, experienced by both children and service users, were identified in the paper, e.g., diversity in recruitment and competing institutional agendas. Acknowledging that these challenges are not unique to childhood research, emphasises that involvement structures in general would benefit from being more accessible, and encourages discussion of how accessibility issues could be tackled jointly or more widely, for example in relation to institutional payment structures or funding requirements. Issues around research relationships, communication and partnership working, identified in both bodies of literature, also illustrate the benefits of adopting a broader perspective, which for example could help develop training for researchers for both types of involvement. Based on the comparison with service user involvement, two further tangible suggestions for practically enhancing children's involvement and addressing the reported challenges could be: (1) to strengthen organisational support and structures within higher education institutions to facilitate and provide support for the involvement of diverse groups of children; and (2) to devise a more specific and systematic reporting mechanism, similar to the GRIPP checklist, to provide evidence, examples of good practice and areas of improvement.

At the conceptual level, the comparison between children's involvement in research and service user involvement similarly identified a number of areas, where the use of theoretical concepts could be challenged and developed by engaging in cross-disciplinary discussions. This was most significant in relation to the concept of 'power' which is frequently invoked in both bodies of literature, but rarely underpinned by relevant social theories of power. Research involving children often describe an asymmetrical power relation between children and adults, but as the comparison has shown, some service users may also find themselves relatively 'powerless' in the research encounter, emphasising the constantly negotiated and relative nature of power relationships. Another concept which could benefit from cross-disciplinary exploration, is the notion of 'empowerment' which

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in both types of work predominantly draws on ideas about individual voice, participation and skills development, rather than more collective notions of empowerment. This may be due to the fact that the conceptual foundation of childhood studies largely originates in the Global North (Hanson et al. 2018) and that service user involvement has a strong neo-liberal element (Beresford 2002).

In a set of conversations, published as part of the 25th anniversary of the journal *Childhood*, a number of prominent childhood scholars have called for childhood studies to become less northern centric, and to increasingly engage with other disciplines as a way to advance theoretically and methodologically (Spyrou 2018; Alanen et al. 2018). This paper has responded to the latter, by bringing together insights from the literature on child involvement and service user involvement. For reasons outlined above, the paper focused on literature from the UK and thus has not addressed the former call for a more inclusive and global approach. However, a comparison between child and adult involvement in the Global South could be a relevant and important extension, which would allow for further exploration and challenging of methodological practices and conceptual developments from different perspectives.

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References

Alanen, Leena, Claudio Baraldi, Ning de Coninck-N. Smith, Caitríona Ní Laoire, and Kay Tisdall. 2018. Cross-disciplinary conversation in childhood studies: Views, hopes, experiences, reflections, 25th anniversary special section: Conversations. *Childhood* 25: 127–41. [CrossRef]

Alderson, Priscilla. 2001. Research by children. International Journal of Social Research Methodology 4: 139-53. [CrossRef]

- Ashcroft, Joanne, Til Wykes, Joseph Taylor, Adam Crowther, and George Szmukler. 2016. Impact on the individual: What do patients and carers gain, lose and expect from being involved in research? *Journal of Mental Health* 25: 28–35. [CrossRef] [PubMed]
- Bailey, S., K. Boddy, S. Briscoe, and C. Morris. 2015. Involving disabled children and young people as partners in research: A systematic review: Involving disabled children and young people as partners in research. *Child: Care, Health and Development* 41: 505–14. [CrossRef]
- Barber, Rosemary, Peter Beresford, Jonathan Boote, Cindy Cooper, and Alison Faulkner. 2011. Evaluating the impact of service user involvement on research: A prospective case study: Evaluating the impact of service user involvement on research. *International Journal of Consumer Studies* 35: 609–15. [CrossRef]
- Barker, John, and Susie Weller. 2003. "Is it fun?" developing children centred research methods. *International Journal of Sociology and Social Policy* 23: 33–58. [CrossRef]
- Beresford, Peter. 2002. User Involvement in Research and Evaluation: Liberation or Regulation? *Social Policy and Society* 1: 95–105. [CrossRef]
- Bergström, Kerstin, Lena Jonsson, and Helena Shanahan. 2010. Children as co-researchers voicing their preferences in foods and eating: Methodological reflections. *International Journal of Consumer Studies* 34: 183–89. [CrossRef]
- Bird, Deborah, Lorraine Culley, and Monica Lakhanpaul. 2013. Why collaborate with children in health research: An analysis of the risks and benefits of collaboration with children. *Archives of Disease in Childhood-Education and Practice* 98: 42–48. [CrossRef]
- Boote, Jonathan, Ruth Wong, and Andrew Booth. 2015. 'Talking the talk or walking the walk?' A bibliometric review of the literature on public involvement in health research published between 1995 and 2009. *Health Expectations* 18: 44–57. [CrossRef]
- Bradbury-Jones, Caroline, and Julie Taylor. 2015. Engaging with children as co-researchers: Challenges, counter-challenges and solutions. *International Journal of Social Research Methodology* 18: 161–73. [CrossRef]
- Branfield, Fran. 2009. Developing User Involvement in Social Work Education (No. 29), Workforce Development Report. London: SCIE.

- Brett, Jo, Sophie Staniszewska, Carole Mockford, Sandra Herron-Marx, John Hughes, Colin Tysall, and Rashida Suleman. 2014. Mapping the impact of patient and public involvement on health and social care research: A systematic review. *Health Expectations* 17: 637–50. [CrossRef]
- Burton, Debbie, Margaret Smith, and Kevin Woods. 2010. Working with teachers to promote children's participation through pupil-led research. *Educational Psychology in Practice* 26: 91–104. [CrossRef]
- Christensen, Pia, and Allison James. 2008. Introduction—Researching Children and Childhood Cultures of Communication. In *Research with Children—Perspectives and Practices*. Edited by Pia Christensen and Allison James. London: Routledge, pp. 1–9.
- Clark, Elaine. 2004. Action learning with young carers. Action Learning Research and Practice 1: 109–16. [CrossRef]
- Clark, Alison, and June Statham. 2005. Listening to Young Children: Experts in Their Own Lives. *Adoption & Fostering* 29: 45–56. [CrossRef]
- Clavering, Emma K., and Janice McLaughlin. 2010. Children's participation in health research: From objects to agents?: Children's participation in health research. *Child Care, Health and Development* 36: 603–11. [CrossRef]
- Coad, Jane, and Ruth Evans. 2007. Reflections on Practical Approaches to Involving Children and Young People in the Data Analysis Process: Involving Children in the Data Analysis Process. *Children Society* 22: 41–52. [CrossRef]
- Coppock, Vicki. 2011. Children as Peer Researchers: Reflections on a Journey of Mutual Discovery: Children as Peer Researchers. *Children Society* 25: 435–46. [CrossRef]
- Cox, Sue, and Anna Robinson-Pant. 2008. Power, participation and decision making in the primary classroom: Children as action researchers. *Educational Action Research* 16: 457–68. [CrossRef]
- Crivello, Gina, Laura Camfield, and Martin Woodhead. 2009. How Can Children Tell Us About Their Wellbeing? Exploring the Potential of Participatory Research Approaches within Young Lives. *Social Indicators Research* 90: 51–72. [CrossRef]
- Cuevas-Parra, Patricio, and E. Kay M. Tisdall. 2019. Child-Led Research: Questioning Knowledge. *Social Science* 8: 44. [CrossRef]
- Dalli, Carmen, and Sarah Te One. 2012. Involving children in educational research: Researcher reflections on challenges. *International Journal of Early Years Education* 20: 224–33. [CrossRef]
- Devine, Dympna. 2002. Children's citizenship and the Structuring of adult–child Relations in the primary school. *Childhood* 9: 303–20. [CrossRef]
- Domecq, Juan Pablo, Gabriela Prutsky, Tarig Elraiyah, Zhen Wang, Mohammed Nabhan, Nathan Shippee, Juan Pablo Brito, Kasey Boehmer, Rim Hasan, Belal Firwana, and et al. 2014. Patient engagement in research: A systematic review. *BMC Health Services Research* 14: 89. [CrossRef]
- Dudley, Louise, Carrol Gamble, Alison Allam, Philip Bell, Deborah Buck, Heather Goodare, Bec Hanley, Jennifer Preston, Alison Walker, Paula Williamson, and et al. 2015. A little more conversation please? Qualitative study of researchers' and patients' interview accounts of training for patient and public involvement in clinical trials. *Trials* 16: 190. [CrossRef]
- Dunn, Jill. 2015. Insiders' perspectives: A children's rights approach to involving children in advising on adult-initiated research. *International Journal of Early Years Education* 23: 394–408. [CrossRef]
- Fleming, Jennie, Goodman Hannah Chong, and Alison Skinner. 2009. Experiences of Peer Evaluation of the Leicester Teenage Pregnancy Prevention Strategy. *Children Society* 23: 279–90. [CrossRef]
- Flewitt, Rosie, Phil Jones, John Potter, Myrrh Domingo, Paul Collins, Ellie Munday, and Karen Stenning. 2018. 'I enjoyed it because ... you could do whatever you wanted and be creative': Three principles for participatory research and pedagogy. *International Journal of Research Method in Education* 41: 372–86. [CrossRef]
- Franks, Myfawny. 2011. Pockets of Participation: Revisiting Child-Centred Participation Research: Revisiting Child-Centred Participation Research. *Children Society* 25: 15–25. [CrossRef]
- Gaillard, Segolene, Salma Malik, Jenny Preston, Begonya Nafria Escalera, Pamela Dicks, Nathalie Touil, Sandrine Mardirossian, Joana Claverol-Torresi, and Behrouz Kassaï. 2018. Involving children and young people in clinical research through the forum of a European Young Persons' Advisory Group: Needs and challenges. *Fundamental & Clinical Pharmacology* 32: 357–62. [CrossRef]
- Gallagher, Michael. 2008. 'Power is not an evil': Rethinking power in participatory methods. *Children's Geographies* 6: 137–50. [CrossRef]

- Gillard, Steven, Rohan Borschmann, Kati Turner, Norman Goodrich-Purnell, Kathleen Lovell, and Mary Chambers. 2010. What difference does it make?' Finding evidence of the impact of mental health service user researchers on research into the experiences of detained psychiatric patients: Impact of mental health service user researchers on research. *Health Expectations* 13: 185–94. [CrossRef]
- Gray, Colette, and Eileen Winter. 2011. Hearing voices: Participatory research with preschool children with and without disabilities. *European Early Childhood Education Research Journal* 19: 309–20. [CrossRef]
- Green, Gill. 2016. Power to the people: To what extent has public involvement in applied health research achieved this? *Research Involvement and Engagement* 2: 28. [CrossRef]
- Hammersley, Martyn. 2017. Childhood Studies: A sustainable paradigm? Childhood 24: 113–27. [CrossRef]
- Hanley, Bec. 2005. *Research as empowerment? Report of a series of seminars organized by the Toronto Group*. London: Joseph Rowntree Foundation, Available online: https://www.jrf.org.uk/sites/default/files/jrf/migrated/files/ 1859353185.pdf (accessed on 12 April 2019).
- Hanson, Karl, Tatek Abebe, Stuart C Aitken, Sarada Balagopalan, and Samantha Punch. 2018. 'Global/local' research on children and childhood in a 'global society', 25th anniversary special section: Conversations. *Childhood* 25: 272–96. [CrossRef]
- Haugaard, Mark. 2002. Power: A Reader. Manchester: Manchester University Press.
- Holland, Sally, Emma Renold, Nicola J. Ross, and Alexandra Hillman. 2010. Power, agency and participatory agendas: A critical exploration of young people's engagement in participative qualitative research. *Childhood* 17: 360–75. [CrossRef]
- Hooper, Carol-Ann, and Robert Gunn. 2014. Recognition as a framework for ethical participatory research: Developing a methodology with looked after young people. *International Journal of Social Research Methodology* 17: 475–88. [CrossRef]
- Horgan, Deirdre. 2017. Child participatory research methods: Attempts to go 'deeper'. *Childhood* 24: 245–59. [CrossRef]
- Horton, John, and Peter Kraftl. 2018. Three playgrounds: Researching the multiple geographies of children's outdoor play. *Environment and Planning A: Economy and Space* 50: 214–35. [CrossRef]
- Howe, Amanda, Elspeth Mathie, Diane Munday, Marion Cowe, Claire Goodman, Julia Keenan, Sally Kendall, Fiona Poland, Sophia Staniszewska, and Patricia Wilson. 2017. Learning to work together—Lessons from a reflective analysis of a research project on public involvement. *Research Involvement and Engagement* 3: 1. [CrossRef]
- INVOLVE. 2015. Public Involvement in Research: Values and Principles Framework October. London: INVOLVE.
- James, Allison. 2007. Ethnography in the Study of Children and Childhood. In *Handbook of Ethnography*. Edited by Paul Atkinson, Amanda Coffey and Sara Delamont. London: Sage, pp. 246–57.
- Jørgensen, Clara Rübner, Judith Purkis, Loraine Blaxter, and Susan Tulip. 2016. Accredited Training for User Involvement in Higher Education Teaching—Exploring an Innovative Training Programme in Public Involvement and Partnership Working. *International Journal of Practice-based Learning in Health and Social Care* 4: 49–62. [CrossRef]
- Jørgensen, Clara Rübner, Thora Grothe Thomsen, Lone Ross, Susanne Malchau Dietz, Signe Therkildsen, Mogens Groenvold, Charlotte Lund Rasmussen, and Anna Thit Johnsen. 2017a. What facilitates 'patient empowerment' in cancer patients during follow-up?—A qualitative systematic review of the literature. *Qualitative Health Research* 28. [CrossRef]
- Jørgensen, Clara Rübner, Nanna Bjerg Eskildsen, Thora Grothe Thomsen, Inger Duus Nielsen, and Anna Thit Johnsen. 2017b. The impact of using peer interviewers in a study of patient empowerment amongst people in cancer follow up. *Health Expectations* 21: 620–627. [CrossRef]
- Jørgensen, Clara Rübner, Nanna Bjerg Eskildsen, and Anna Thit Johnsen. 2018. User Involvement in a Danish project on the Empowerment of Cancer patients—Experiences and Early Recommendations for Further Practice. *Research Involvement and Engagement* 4. [CrossRef]
- Kellett, Mary. 2005. Children as Active Researchers: A New Research Paradigm for the 21st Century? London: ESRC.
- Kellett, Mary, Chris Robinson, and Rachel Burr. 2004. Images of Childhood. In *Doing Research with Children and Young People*. Edited by Sandy Fraser, Vicky Lewis, Sharon Ding, Mary Kellett and Chris Robinson. London: Sage Publications, pp. 27–42.
- Kellett, Mary. 2010. Small Shoes, Big Steps! Empowering Children as Active Researchers. American Journal of Community Psychology 46: 195–203. [CrossRef]

- Kellett, Mary, Allan Aoslin, Ross Baines, Alice Clancy, Lizzie Jewiss-Hayden, Ryan Singh, and Josh Strudgwick. 2010. WeCan2: Exploring the implications of young people with learning disabilities engaging in their own research. *European Journal of Special Needs Education* 25: 31–44. [CrossRef]
- Kim, Chae-Young. 2016. Why Research 'by' Children? Rethinking the Assumptions Underlying the Facilitation of Children as Researchers. *Children Society* 30: 230–40. [CrossRef]
- Kim, Chae-Young. 2017. Participation or pedagogy? Ambiguities and tensions surrounding the facilitation of children as researchers. *Childhood* 24: 84–98. [CrossRef]
- Kirby, Perpetua. 2004. A Guide to Actively Involving Young People in Research: For Researchers, Research Commissioners, and Managers. London: INVOLVE.
- Kirby, Perpetua, Claire Lanyon, Kathleen Cronin, Ruth Sinclair, Great Britain, Department for Education and Skills, National Children's Bureau, and PK Research Consultancy. 2003. Building a Culture of Participation: Involving Children and Young People in Policy, Service Planning, Delivery and Evaluation: Research Report. Nottingham: DfES Publications.
- Leitch, Ruth, John Gardner, Stephanie Mitchell, Laura Lundy, Oscar Odena, Despina Galanouli, and Peter Clough. 2007. Consulting pupils in Assessment for Learning classrooms: The twists and turns of working with students as co-researchers. *Educational Action Research* 15: 459–78. [CrossRef]
- Lomax, Helen. 2012. Contested voices? Methodological tensions in creative visual research with children. *International Journal of Social Research Methodology* 15: 105–17. [CrossRef]
- Lomax, Helen. 2015. Seen and heard? Ethics and agency in participatory visual research with children, young people and families. *Families Relationships and Societies* 4: 493–502. [CrossRef]
- Lundy, Laura, and Lesley McEvoy. 2012. Children's rights and research processes: Assisting children to (in)formed views. *Childhood* 19: 129–44. [CrossRef]
- Lundy, Laura, Lesley McEvoy, and Bronagh Byrne. 2011. Working with Young Children as Co-Researchers: An Approach Informed by the United Nations Convention on the Rights of the Child. *Early Education and Development* 22: 714–36. [CrossRef]
- Mawn, Lauren, Patrick Welsh, Lauren Kirkpatrick, Lisa A.D. Webster, and Helen J. Stain. 2016. Getting it right! Enhancing youth involvement in mental health research. *Health Expectations* 19: 908–19. [CrossRef]
- McKeown, Mick, Lisa Malihi Shoja, Soo Downe, and the Comensus Writing Collective. 2010. Service User and Carer involvement in Higher Education, in: Service User and Carer Involvement in Education for Health and Social Care. Chichester: Wiley-Blackwell.
- McLaughlin, Hugh. 2005. Involving Young Service Users as Co-Researchers: Possibilities, Benefits and Costs. British Journal of Social Work 36: 1395–410. [CrossRef]
- Messiou, Kyriaki. 2014. Working with students as co-researchers in schools: A matter of inclusion. *International Journal of Inclusive Education* 18: 601–13. [CrossRef]
- Mockford, Carole, Matt Murray, Kate Seers, Jan Oyebode, Richard Grant, Sue Boex, Sophie Staniszewska, Yvonne Diment, Jim Leach, Uma Sharma, and et al. 2016. A SHARED study-the benefits and costs of setting up a health research study involving lay co-researchers and how we overcame the challenges. *Research Involvement and Engagement* 2: 8. [CrossRef]
- Morrow, Virginia. 2008. Ethical dilemmas in research with children and young people about their social environments. *Children Geographies* 6: 49–61. [CrossRef]
- Murray, Cathy. 2006. Peer Led Focus Groups and Young People. Children Society 20: 273–96. [CrossRef]
- O'Brien, Niamh, and Tina Moules. 2007. So round the spiral again: A reflective participatory research project with children and young people. *Educational Action Research* 15: 385–402. [CrossRef]
- O'Kane, Claire. 2008. The Development of Participatory Techniques: Facilitating Children's views about Decisions Which Affect them. In *Research with Children—Perspectives and Practices*. Edited by Pia Christensen and Allison James. London: Routledge.
- Ocloo, Josephine, and Rachel Matthews. 2016. From tokenism to empowerment: Progressing patient and public involvement in healthcare improvement. *BMJ Quality & Safety* 25: 626–32. [CrossRef]
- Oliver, Kathryn, Rebecca Rees, Louca-Mai Brady, Josephine Kavanagh, Sandy Oliver, and James Thomas. 2015. Broadening public participation in systematic reviews: A case example involving young people in two configurative reviews: Broadening Participation in Systematic Reviews. *Research Synthesis Methods* 6: 206–17. [CrossRef]

- Omeni, Edward, Marian Barnes, Dee MacDonald, Mike Crawford, and Diana Rose. 2014. Service user involvement: Impact and participation: A survey of service user and staff perspectives. *BMC Health Services Research* 14: 491. [CrossRef]
- Pearson, Rebecca, and Julia Howe. 2017. Pupil participation and playground design: Listening and responding to children's views. *Educational Psychology in Practice* 33: 356–70. [CrossRef]
- Prout, Alan. 2005. The Future of Childhood—Towards an Interdisciplinary Study of Children. London: Routledge Falmer.
- Punch, Samantha. 2002. Research with children—The same or different from research with adults? *Childhood* 9: 321–41. [CrossRef]
- SCIE. 2009. At a Glance 19: Building User and Carer Involvement in Social Work Education. Available online: https://www.scie.org.uk/publications/ataglance/ataglance19.asp (accessed on 8 May 2019).
- Shippee, Nathan D., Juan Pablo Domecq Garces, Gabriela J. Prutsky Lopez, Zhen Wang, Tarig A. Elraiyah, Mohammed Nabhan, Juan P. Brito, Kasey Boehmer, Rim Hasan Belal Firwana, and et al. 2015. Patient and service user engagement in research: A systematic review and synthesized framework. *Health Expectations* 18: 1151–66. [CrossRef]
- Sime, Daniela. 2008. Ethical and methodological issues in engaging young people living in poverty with participatory research methods. *Children Geographies* 6: 63–78. [CrossRef]
- Sime, Daniela, and Rachael Fox. 2015. Home abroad: Eastern European children's family and peer relationships after migration. *Childhood* 22: 377–93. [CrossRef]
- Skelton, Tracey. 2007. Children, Young People, UNICEF and Participation. Children Geographies 5: 165–81. [CrossRef]
- Smith, Roger, Maddy Monaghan, and Bobby Broad. 2002. Involving Young People as Co-Researchers: Facing up to the Methodological Issues. *Qualitative Social Work* 1: 191–207. [CrossRef]
- Spyrou, Spyros. 2018. *Disclosing Childhoods: Research and Knowledge Production for a Critical Childhood Studies*. Basingstoke: Palgrave Macmillan.
- Spyrou, Spyros, Matías CorderoArce, Florian Eßer, Rachel Rosen, and Afua Twum-Danso Imoh. 2018a. Emerging scholars of Childhood Studies, 25th anniversary special section: Conversations. *Childhood* 25: 422–42. [CrossRef]
- Staniszewska, Sophie, Jo Brett, Carole Mockford, and Rosemary Barber. 2011. The GRIPP checklist: Strengthening the quality of patient and public involvement reporting in research. *International Journal of Technology Assessment in Health Care* 27: 391–99. [CrossRef]
- Staniszewska, Sophie, Jo Brett, Iveta Simera, Kate Seers, Carole Mockford, Susan Goodlad, Doug Altman, David Moher, Rosemary Barber, Simon Denegri, and et al. 2017. GRIPP2 reporting checklists: Tools to improve reporting of patient and public involvement in research. *Research Involvement and Engagement* 3: 13. [CrossRef]
- Supple, David, Amanda Roberts, Val Hudson, Sarah Masefield, Neil Fitch, Malayka Rahmen, Breda Flood, Willem de Boer, Pippa Powell, and Scott Wagers. 2015. From tokenism to meaningful engagement: Best practices in patient involvement in an EU project. *Research Involvement and Engagement* 1: 5. [CrossRef]
- Taylor, Julie, Caroline Bradbury-Jones, Helen Hunter, Kate Sanford, Tom Rahilly, and Nayla Ibrahim. 2014. Young People's Experiences of Going Missing from Care: A Qualitative Investigation using Peer Researchers. *Child Abuse Review* 23: 387–401. [CrossRef]
- Thomson, Jane, Sarah Lanchin, and Dan Moxon. 2015. *Be Real with Me: Using peer Research to Explore the Journeys of Young People Who Run Away from Home or Care.* London: The Railway Children.
- Tisdall, E. Kay. M. 2012. The Challenge and Challenging of Childhood Studies? Learning from Disability Studies and Research with Disabled Children. *Children Society* 26: 181–91. [CrossRef]
- Tyrell, Naomi. 2001. Children's agency in Family decision making in Britain. In Everyday Ruptures: Children, Youth, and Migration in Global Perspective. Edited by Cati Coe, Rachel R. Reynolds, Deborah A. Boehm, Julia Meredith Hess and Heather Rae-Espinoza. Nashville: Vanderbilt University Press.
- Vis, Svein Arild, Astrid Strandbu, Amy Holtan, and Nigel Thomas. 2011. Participation and health—A research review of child participation in planning and decision-making: Child participation in planning and decision-making. *Child & Family Social Work* 16: 325–35. [CrossRef]
- Willumsen, Elisabeth, Jon Vegar Hugaas, and Ingunn Studsrød. 2014. The Child as Co-researcher—Moral and Epistemological Issues in Childhood Research. *Ethics and Social Welfare* 8: 332–49. [CrossRef]
- Wyness, Michael. 2013. Children's participation and intergenerational dialogue: Bringing adults back into the analysis. *Childhood* 20: 429–42. [CrossRef]

Wyness, Michael G. 2015. Childhood, Key Concepts Series. Cambridge and Malden: Polity Press.

Yanar, Zeynep M., Mehria Fazli, Jahanara Rahman, and Rys Farthing. 2016. Research Ethics Committees and Participatory Action Research with Young People: The Politics of Voice. *Journal of Empirical Research on Human Research Ethics* 11: 122–28. [CrossRef]



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