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ORIGINAL ARTICLE

Sensory Tours as a Method for Engaging Children as Active Researchers: Exploring the Use of Wearable Cameras in Early Childhood Research

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Abstract This article explores the use of wearable cameras with children as a data collection means to engage young children as active researchers in recording their experiences in natural environments. This method captures children's unique perspectives of being-in-the-world, depicting what they see, hear, say, touch, and their interactions with others. In this paper, this method is called Sensory Tours, informed by the tradition of walking tours used in environmental education. It is a nonintrusive means of collecting data, providing children with control over what data they collect, and removing the need for an adult researcher with a video camera propping and prodding over children's day-to-day activities. In this paper, the advantages, challenges, and opportunities of wearable cameras are evaluated and illustrated through the video records made by children. The method provides opportunities for subsequent video-stimulated group discussions and other interactive activities that can enrich understandings of children's lived experiences. Sensory Tours provide a means for children to analyze, reconstruct, and interpret salient aspects of their experiences in discussions with peers and adults.

Keywords Phenomenography · Participatory research · Early childhood pedagogy · Digital videos · Environmental education

Résumé Cet article explore l'utilisation de caméras portables avec des enfants comme un moyen de collecte de données pour impliquer les jeunes enfants comme chercheurs actifs dans l'enregistrement de leurs expériences dans des environnements naturels. Cette méthode capte les perspectives uniques aux enfants d'être dans le monde, décrivant ce qu'ils voient, entendent, disent, touchent, ainsi que

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leurs interactions avec les autres. Dans cet article, cette méthode est appelée «visites sensorielles», éclairée par la tradition des visites à pied utilisées en éducation à l'environnement. C'est un moyen non intrusif de collecte de données, donnant aux enfants un contrôle sur les données qu'ils cueillent, et supprimant le besoin d'un chercheur adulte par le support d'une caméra vidéo pour observer les activités quotidiennes des enfants. Dans cet article, les avantages, les défis et les possibilités des caméras portables sont évalués et illustrés à l'aide des enregistrements vidéo réalisés par les enfants. La méthode fournit des opportunités de discussions de groupe stimulées par les vidéos et d'autres activités interactives subséquentes qui peuvent enrichir la compréhension des expériences vécues par les enfants. Les visites sensorielles donnent aux enfants un moyen d'analyser, reconstruire et interpréter les aspects saillants de leurs expériences dans des discussions avec les pairs et les adultes.

Resumen Este artículo explora el uso de cámaras portátiles con niños/as como un método para recolectar información y para animarlos a desempeñar el papel de investigadores participantes en la documentación de sus experiencias en los entornos naturales. Este método capta las perspectivas de los niños y las niñas, de la manera en la cual ellos/as sienten y perciben su entorno, transmite lo que ellos/as ven, oyen, dicen, y tocan en sus interacciones con otras personas. En este artículo, este método se denomina Recorridos Sensoriales, el cual se apoya en el método de Recorridos Activos utilizados en la educación ambiental. Este es un método no invasivo para recabar información que le otorga control a los niños y niñas, sobre el tipo de información a recolectar, igualmente elimina la participación de un investigador adulto con cámara en mano guiando y orientando a los niños/as en sus actividades diarias. En este artículo se evalúan e ilustran las ventajas, retos, y oportunidades de las cámaras portátiles a través de las grabaciones de video hechas por los niños. Este método ofrece oportunidades de aplicación en discusiones grupales estimuladas por video y en otras actividades interactivas que pueden enriquecer la comprensión de las experiencias vividas por los niños. Los Recorridos Sensoriales les dan oportunidades a los niños/as para que analicen, reconstruyan e interpreten aspectos significativos de sus experiencias en diálogos con sus compañeros/as y con adultos.

Introduction

Children are active agents in constructing their own culture and place in all of the various social, cultural, and geographical contexts in which they are exposed. In recognizing children's agency and rights of participation (United Nations 1989; 2005), childhood researchers continue to advocate for participatory approaches of research that honor children's voices and perspectives (Barratt Hacking et al. 2013; Green 2015; James 2009). Such approaches are participatory in the sense that children are invited to exercise some level of control in the research process. While the issue of control has long been debated among qualitative researchers (Lincoln

et al. 2011), this issue is particularly contentious in research involving young children because of their subordinate positioning in an adult world (Corsaro 2005). Indeed, the power imbalance between the adult researcher and child participants can greatly impact *what* data are collected and *how* they are interpreted. In addressing this issue, some have suggested relational approaches, emphasizing the importance of establishing trust with children, creating a comfortable environment, and providing children with choices in participation (Clark 2005; Einarsdottir et al. 2009; Green 2012; Parkinson 2001). Such approaches typically rely on child-friendly data collection methods (i.e., artwork, photography, and other interactive activities) to encourage children's active participation. However, relational approaches still rely on the direct involvement of adult researchers in the process and depending on the relationship established, the researcher's involvement will inevitably influence the way children act and behave. Others have suggested the use of video as a means to "pick up different sorts of voices" along "with a range of images" (Haw 2008). However, control issues have also been raised regarding the use of video with young children. Namely, Robson (2011) discussed the tension of remaining unobtrusive when filming preschool-aged children through the use of traditional video equipment (a handheld camcorder). Additionally, traditional video data are still framed through the researcher's point of view, that is to say images are never neutral and they are literally and socially constructed (Robson 2011, p. 186). Thus, Robson (2011) experimented with inviting children to hold the camera and film, finding that this strategy was "vitally important" in providing children a "sense of ownership in the process" (p. 183). However, having young children hold video cameras can be logistically problematic in that handheld camcorders can become heavy or difficult for young children to operate, and because operating a camera requires the use of children's hands, this strategy may prevent children from participating in authentic play or other day-to-day activities. In other words, handheld cameras (held by adults or by children) can be intrusive in the research process. So how can children's authentic experiences of their world be collected in an unobtrusive manner? This article evaluates a novel method called "Sensory Tours," as a means for seeing and perceiving the world through the lens of a child.

A Brief Review of Wearable Cameras in Research with Children

A distinctive feature of the wearable camera is that it records what the user sees and experiences in day-to-day activities or during extreme or unexpected events (Chaflen 2014). While the use of wearable cameras in social science research involving adults continues to expand, the incorporation of wearable cameras in research involving children has thus far been limited. Ghekiere et al. (2014)implemented a "bike along" method, inviting 9- to 10-year-old children to wear cameras to record their encounters with environmental features while cycling. The "bike along" method included engaging children in discussions about the features they encountered, suggesting a child-directed approach that emphasizes the perspectives of children. Kindt (2011) explored inviting high school students to wear cameras using head straps in the classroom. The novelty of wearing a camera and watching the videos seemed to draw student interest, providing the teacher with

a "never before" view of "what students see" and experience in the classroom (Kindt 2011, pp. 182–183). Only one study involving young children was identified (Mortlock et al. 2014); the researchers utilized a GoPro® camera to film 5- to 7-year-old children's experiences during classroom mat time. However, rather than having a child wear the GoPro®, the camera was mounted to a whiteboard near the mat in order to video record children's interactions. In this way, the camera was used similarly to a traditional camcorder. While the researchers also implemented interactive interviews to explore the children's perspectives of their experiences, they did not engage children in analyzing and interpreting the video footage that was collected (Mortlock et al. 2014). The limited literature found on incorporating wearable cameras in research involving young children suggests a need to further explore this topic.

Methodology and Study Context

The methods presented in this paper are derived from a participatory phenomenological study aimed at engaging young children as active researchers of their own experiences in a forest. Thirty-one children aged from 3 to 6 years enrolled in a University early childhood education program participated in the project. However, only 20 or so children were involved in the research on any given day, because some children only attended the preschool part time. Set in a northern birch tree forest, the children, with their teachers and researchers, visited the same patch of forest near their school eleven times for approximately an hour each time, over a ten-week summer period. Time spent in the forest primarily consisted of children's open-ended play and exploration collected by way of *Sensory Tours*. Additionally, the study included seven classroom visits to engage children in data analysis and interpretation activities using video-stimulated recall discussions. While other exploratory methods were utilized in the larger research project (i.e., role-playing, art in the forest, and building a model), they are not the focus of this paper.

The Institutional Review Board of the University in which the researcher is affiliated approved the research. Permissions were obtained from the early childhood education center director and teachers as well as from parents of the children who participated in the project. Child assent was sought at the beginning of the project and during all research activities. In this way, children were invited to choose what, if, and how long they wanted to engage in each particular research activity.

The study was informed by phenomenological traditions as it focused on the "careful description of ordinary conscious experience[s] of everyday life" (Schwandt 2015, p. 234). Phenomenological meanings are derived from "perception (hearing, seeing, etc.), believing, remembering, deciding, feeling, judging, evaluating, and all experiences of bodily action" (Schwandt 2015, p. 234). Rejecting scientific realism, reality is interpreted as subjective and is recognized as socially constructed through an actor's performance of actions, "*without any communicative intent*" and through expressive discourse or with "*communicative intent*" (Schutz 1967, p. 36).

In interpreting another's actions without communicative intent, an observer is limited; whereas interpretation is primarily derived through the observer's understandings and may or may not accurately represent an actor's intention (Schutz 1967). Yet if an observer interferes with an action to pose questions, he or she runs the risk that such interference would alter the situation and the actor's performance (Schutz 1967). Such concerns are heightened in the case of participatory research involving young children because of the power relations between the adult researcher and children participants (Corsaro 2005). Specifically, the presence of an adult influences the way that children act and behave. Thus, this study was interested in exploring *Sensory Tours* as a method to capture children's authentic play and exploration in the forest with limited adult interference.

This study also explored phenomenological meaning derived through expressive discourse, or "communicative intent," that is, through thoughts, words, and ideas that are gradually constructed between listeners and speakers (Schutz 1967). Thus, footage captured through *Sensory Tours* was used to facilitate video-stimulated recall discussions and other interactive activities to engage children in choosing their own research topics and analyzing and interpreting the data that they collected. In this way, observational methods (video recordings of children's play in the forest) were combined with methods that supported children in socially constructing and reconstructing their experiences. Meanings were recalled, clarified, and informed through interactions and exchanges among peers, teachers, and the researchers. The advantages, challenges, and opportunities of using *Sensory Tours* in research aimed at understanding young children's experiences of their environment will be described in detail in the sections that follow.

The *Sensory Tour* Method

The *Sensory Tour* method conceived and explored in this study was informed by the tradition of walking tours used in geographical and environmental education research involving children. Tours have been successfully used as a research method to understand children's experiences and perspectives of place and their environment (Hart 1979; Green 2011, 2012, 2013; Sobel 1993). Given the tendency of children to "talk while they are doing" (Parkinson 2001, p. 145), walking tours provide an alternative format to engage children in conversations. Tours provide children with an opportunity to show and tell about what is important to them within a familiar and naturalistic setting (Hart 1979; Green 2012). In other words, "tours allow opportunities for children to show something that cannot be explained" apart from the setting (Green 2012, p. 275).

The incorporation of wearable cameras enriches the walking tour method. Specifically, the wearable camera records a view of the world through the perspective of the person, in this case a child, who is wearing it (Chaflen 2014). Thus, the *Sensory Tour* method provides adult researchers with a deeper insight of children's experiences of "being-in-the-world"—understood as being in a particular space at a particular time (Heidegger 1962). In this way, it not only records children's actions and interactions with phenomenon in their environment, it also

makes apparent features of the environment of interest to a child that might go unnoticed or be taken for granted by an adult.

Children in this study were invited to wear a small camera while they freely playing and exploring in the forest. A small durable camera such as a GoPro® is ideal because it is protected inside a plastic casing and can be worn around the forehead or chest. Although children were provided with the option of wearing a GoPro® on either their forehead or chest, most children indicated that they preferred wearing a camera on their forehead.

Participation in a *Sensory Tour* was completely voluntary. However, since most children wanted to wear a camera, the teachers and researchers helped to ensure that all who were interested were given an opportunity. *Sensory Tours* were open-ended and lasted as long as the children were interested. If a child decided they no longer wanted to wear a camera, they simply found a teacher or researcher and asked to have the camera removed. Table 1 provides an overview of advantages, challenges, and opportunities of using *Sensory Tours* as a method in childhood research. These will be described in detail in the sections that follow.

Evaluation of the Sensory Tour Method

Advantages

Sees What Children See

Positioned on the forehead of a child, the wearable camera captures what children see, hear, say, and touch in their environments. In viewing footage captured in a *Sensory Tour*, one nearly feels as if they are walking in the shoes of the child. The wearable camera distinguishes when a child turns his or her head, when they looks up or down, when they run or fall, the words they exchange with others, and sounds and songs that they utter under their breathe. In other words, it captures children's

Table 1 Advantages, challenges, and opportunities of Sensory Tours

Advantages
Sees what children see
Puts size into perspective
Captures interactions that traditional video methods cannot
Tells the whole story
Unobtrusive/enjoyable
Challenges
Less structure works better
Camera "bull fights" and rough housing
Video size and ensuring the right fit and angle
Opportunities
Engaging children in video analysis and interpretation

self-talk and expressions, their interactions and exchanges with people, places, and objects.

Oliver's *Sensory Tour* provides a unique viewpoint of a child climbing a tree (see Fig. 1). The tour begins when three boys (Oliver, Nathan, and Ryan) came across a dead spruce tree. The short stubby black tree stands at an angle rising about 12 feet above the ground. Its branches are bare and brittle, and the boys take notice of the tree.

Nathan: *That one's new right, Ryan.*
Ryan: *Yeah.*
Nathan: *We never saw it before.*
As the two boy's converse, Oliver wastes no time, he mounts and climbs the two main branches that split from the trunk. His feet are positioned on a lower branch and his arms clasp the limbs of an upper branch. Nathan wanders away and Ryan joins Oliver.
Oliver: *Look at us! Look at us! Teacher! Teacher! Teacher! Teacher!*
Oliver yells for his teacher, who is a short distance away.
Oliver: *I am climbing right here.*
He looks down at his and Ryan's feet positioned on a skinny limb high above the ground (Fig. 1, clip 1).
Oliver: *Whoa!*
Oliver looks around at the branches and up at the sky (Fig. 1, clip 2).

The camera captures Oliver's close-up view of the tree and his heightened outlook of the forest landscape. He calls to his teacher in the distance, and we hear the peer-to-peer conversation between the boys. The boys draw the attention of the teacher and other children. Nathan returns with Jared and Sam.

Jared: *I need to get up.*
Jared is now very close to Oliver (Fig. 1, clip 3).
Oliver: *Excuse me! Excuse me! Excuse me!*
Jared: (looks at Oliver) *Excuse me? You say excuse me. No, you say excuse be.*
Oliver is gripping the branch at the top.
Oliver: *Excuse me. Yaouch!*
Teacher: *Hey Oliver. Do you need to get down?*
Oliver: *Oh!* (He bumps Jared).
Oliver: *No, move.* (He bumps into Jared again).
Teacher: *What are you asking people to excuse me for?*
Oliver: *Because it's me here on this here…tree…it's me… and….*

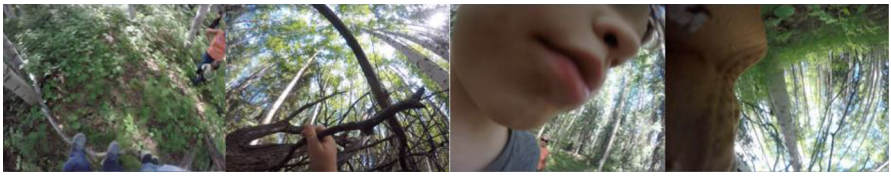

Fig. 1 Oliver's climb and fall from a tree (clips 1–4)

Oliver readjusts his position. He turns towards Nathan climbing near the top of the tree. The tree creaks with the heavy weight.
Jared: *Oh my gosh—it's breaking! It's breaking!*
Nathan: *Yep it is! Yes, this looks like an old tree.*
Jared: *Oh my gosh—it's cracking!*
The tree makes a cracking sound.
Jared: *Yeah, that's breaking it.*
Oliver: *AH!! It's me on that shelf.*
Jared: *Oh my gosh - it's wiggling! We need to get down and fast!*
Oliver: *Oh my gosh!*

Oliver let's go of the branch that he was holding and falls. The camera shows the blur of Nathan's pants above Oliver's head and the trees are upside down (Fig. 1, clip 4).

Oliver vocalized his discomfort by saying, *"Excuse me!"* when Jared crowded him on the tree. When prompted by the teachers, Oliver explains his previous contentment he felt in "being-with" the tree, *"For I am here on this here…tree…it's me…."* He did not like being crowded and expressed his desire to return to his former state of being (Heidegger 1962). The tree became heavy under the weight of the children, and Oliver's discontentment turned to fear that eventually led to his fall.

Puts Size into Perspective

The *Sensory Tour* method brought size into perspective by allowing the researchers to see how big adults and other environmental features appeared to the children. For example, it became apparent just how challenging and overbearing wild rosebushes can be to young children (see Fig. 2). The bushes that stand only about knee high to adults towered over some of the children. On the second day in the forest, Caleb shrieked as he explored a faint trail, *"Big sticker bush, there is a sticker bush right*

Fig. 2 Sensory Tours brought into perspective the size of the "sticker bushes"

there! Aaaawwwhh!" He quickly ran back near the teacher, *"There's big sticker bush everywhere!"*

It was also a bit shocking to see how just how large teachers can appear to children. One particular viewpoint captured by a child reveals an adult's bottom invading the child's space as he ascends up the stairs. Rarely do adults recognize the challenges of size in children's day-to-day experiences.

Captures Interactions that Traditional Video Methods Cannot

Sensory Tours also provide an unobtrusive means to explore children's experiences of the forest without the interference of an adult. In other words, wearable cameras allowed children to engage in authentic peer interactions undisturbed, removing the need for an adult with a video camera looming nearby propping and prodding to capture the nature of children's interactions. This, indeed, returns us back to Schutz (1967) idea of phenomenological meaning derived through an actor's performance of actions without the interference of an observer (researcher). In this study, some children who were quiet and reserved during group discussions were outspoken and leaders among their peers while exploring and playing in the forest. In this way, a wearable camera eliminated the power imbalance between the adult researcher and child participant, providing insight on how children construct understanding through play and interactions with their peers. One particular video clip revealed how a teacher's presence interrupted the play between two girls as they pretend to make food in their "house" in the forest (depicted in the scene below).

Heather and Priscilla gather rose petals and leaves from the rosebushes near their tree (house). They stick the petals on the tree sap of a spruce tree.
Heather: *I'm thirsty. Are you?*
Priscilla: *Umm…we can't do that.*
Heather: *Are you thirsty?*
Priscilla: *No.*
Heather: *I am. So here are our leaves for tea.*
Priscilla: *Are you just pretending you are thirsty or are you really?*
Heather: *Really we have to find something to make tea with. Hmmm…*
Priscilla: *Are you really thirsty or are you just pretending?*
Heather: *I'm actually thirsty.*
Priscilla: *I'm not. I'm a little bit…but not too much. How thirsty are you?*
Heather: *A lot.*
Priscilla's eyes get big and she freezes still, noticing a teacher in the distance.
Priscilla: *Hugh! Tell the teacher…*
Heather: *Hugh…tell the teacher…*
Heather repeats and the two girls look at each other.
Priscilla: *Tell her…*
Priscilla dares Heather. Heather turns and looks at a teacher walking with a boy nearby.
The teacher walks towards the two girls. Heather and Priscilla remain quiet and Heather rubs a leaf against the tree. They look back towards the teacher

who pauses to converse with a small group of children nearby. The girls resume their play.

In this scene, Heather and Priscilla use verbal and nonverbal communication to show how a teacher's presence indirectly influences their play. As they gather leaves and pretend to make tea, the girls incorporate their actual physical desire for a drink into their play. When they notice a teacher nearby, they dare one another to ask the teacher for a drink. Priscilla stated, *"We can't do that,"* indicating that asking for a drink is not something that they should do. Although this restriction was likely put in place for logistical reasons (their school is a 15-min walk away), their interaction also indicated that they were somewhat uncomfortable with the teacher's presence. The girls postpone their play until they noticed the teacher had stopped to talk with other children and was no longer heading in their direction. The *Sensory Tour* method was able to capture an otherwise unobservable interaction between two children, revealing the power dynamics between an adult teacher and the young children.

Tells the Whole Story

Sensory Tours are more likely to reveal the whole story of children's experiences in their environments than traditional video methods. In other words, traditional video methods typically rely on adults for positioning (and repositioning) the direction of the camera, and often adult researchers are only able to capture fragments and segments of participants' experiences—those happened upon or that catch the particular interest of the researcher. *Sensory Tours*, on the other hand, go where a child goes and see what a child sees. In this way, footage captured through a camera worn by a child can tell how many times a child visited a certain place or what events inspired such a visit. For example, in Heather's *Sensory Tour* the entire video footage revealed her strong attachment to a tree in which she claimed as her house in the forest. While the beginning of the video showed Heather and Priscilla preparing food in their "house," the middle of the footage revealed how Priscilla lost interest in Heather's house, expressing her desire to explore other parts of the forest. Although Heather was reluctant, she went along with her friend only to return to her "house" time and time again. The scene (presented below) begins with Priscilla and Heather exploring another part of the forest.

Heather: (suggesting to Priscilla) *If you get hungry in pretend, then I will lead you back to the house.*
Priscilla: *What did you say?*
Heather: *If you are wanting to get back to the house, I can lead you. When you want to go back to the house. I'll lead you.*
Priscilla appears uninterested, but Heather insists.
Heather: *Hmm… I want to go back home. Follow me and we'll be back there.*
Priscilla follows Heather. Heather's pace quickens and she begins humming. At first, Heather goes to the wrong tree.
Heather: *Is it this tree? No it's not this tree. I think I know where the tree is.*
Priscilla: *I think it's one trail down there.*

Heather: *Me too!*
They eventually find the tree, recognizing the sticky sap on the bark. The video shows how Heather went away from the tree three additional times to explore with Priscilla. Yet after each exploration she eagerly returned to her home. Heather finally tells Priscilla that she desires to stay at her house.
Heather: *I don't want to go. I want to be in the house.*
Priscilla: *Don't you know you're supposed to go? Do you?*
Heather: *Yes, I like it here. And I explored around and realized this could be…well somebody else finded that out and then I finded that out and then I wanted to use this as my house and I explored the farthest place so we'd be alive. For all the food and drinks. So that is exploring…*

Heather's *Sensory Tour* lasted for over 30 minute and captured her entire experience of the forest on that particular day. While it is likely that one of the researchers would have noticed her and Priscilla's play near the tree, it is unlikely that they would have noted all the various expressions and actions that revealed her strong attachment toward her "house." In this way, *Sensory Tours* provide opportunities for researchers to explore a more complete story of children's interactions and experiences of their environments.

Nonintrusive/Enjoyable

Lastly, an important advantage of *Sensory Tours* is that they are, for the most part, nonintrusive and enjoyable to children. The children in this study expressed that they liked wearing the cameras, indicating that it was one of their favorite activities during the entire forest research project. While most children seemed to forget that they were wearing them once they were strapped on, some willingly took on the role of an "investigator" while wearing the camera. For example, Jacob showed pride in wearing the camera, telling each person that he happened upon in the forest, *"I am wearing a GoPro®. Did you know whatever I look at is what records on this?"* He leaned close to "take pictures" of bugs on a tree or other environmental features during his forest exploration. In fact, during the children's final research presentation to family and friends, Jacob fondly recalled his *Sensory Tour*, "*I found lots of X-marks-the-spots and I saw some. I used Sensory Tours. I was looking for things with a GoPro® on me."* In this way, *Sensory Tours* can be used as a method to engage children as active researchers in collecting their own data of their experiences.

Challenges

Less Structure is Better

In this study, *Sensory Tours* were also implemented as a collaborative group data collection method. The idea was for children to collectively explore a topic of interest in the forest. Each child in a group was equipped with a wearable camera along with a teacher and researcher who accompanied children on their tour and

promoted dialogue about their topic. Collaborative *Sensory Tours* were attempted with two different groups; one group explored bugs and the other was interested in forts, houses, or castles in the forest.

Although children were grouped according to topics in which they had expressed interest, and although they choose their own topic group, the children did not necessarily share the same experiences of their topic. For example, Rebecca had played "princess castle" with Cindy in the forest, whereas Keenan and Oliver had previously engaged in "monster chases" and other activities. For this reason, placing Rebecca with Keenan and Oliver for a collaborative *Sensory Tour* was not an ideal fit. While Rebecca tagged along during the beginning of the tour, she soon lost interest. Subsequently, her disinterest may have been related to the play scripts attributed to princess castles compared to those of monster castles. While one consisted of tea parties and princess fairies, the other involved dragons and fights.

Keenan also lost interest in the group *Sensory Tour*; however, his disinterest may have been related to Oliver's insistent control over the tour (as described in the scene below).

Oliver: *I see a wood home. Right here is a home.*

He leads the group, pointing at a large tree that is growing horizontally, rising about four feet above the ground. He looks back at the group several times to make sure they are still following him as he moves toward the tree. Once at the tree, he climbs up.

Teacher: *Is that the fort?*
Oliver: *Yeah, I find it. That's our home. I found our home.*
Oliver climbs up the large branch. Keenan looks at Oliver and smiles.
Keenan: *Can I do that?*
Oliver: *No, this hold five people and this end hold two people.*

During the *Sensory Tour*, Oliver leads his teacher and Keenan to his monster castle. Although Oliver refers to the castle tree as "our home," he asserts his control over the situation by defining who and how many can stand on the tree branch. When Keenan expresses an interest in joining Oliver on the tree, asking, *"Can I do that,"* Oliver answers, *"No, this hold five people and this end hold two people."* In this way, Oliver sets specific parameters on what Keenan can do. Keenan soon expresses disinterest in the tour; perhaps, this is due to his inability to exercise his own agency in the exploration.

While children's experiences in the forest are socially constructed with peers and adults, assigning groups for collaborative *Sensory Tours* posed certain limitations. Namely, not all the children assigned to a group were able to exercise agency in what and how they wanted to explore their experiences. For this reason, less structured *Sensory Tours* are recommended to provide children with more autonomy to choose what and with whom they want to explore.

Camera "Bull Fights" and Rough Housing

Rough play with the wearable cameras was not uncommon. Some children decided to play camera "Bull Fights," intentionally banging their cameras, worn around

their forehead, against each other. The cameras were also hit with sticks or sideswiped by branches. However, despite the wear and tear, the small cameras, housed inside their cases, were found to be rather durable and sustained children's rough play without damage.

Video Size and Ensuring the Right Angle and Fit

Finally, adjustment of the video size setting is another small manner that researchers need to consider when incorporating small wearable cameras in their research. Specifically, the default on a GoPro® camera collects fairly large video footage and, if it is not properly adjusted, can easily fill up the storage space on a computer in just a matter of days. Furthermore, once strapped on a child, researchers should check periodically to ensure that the camera is positioned at the correct angle and that it is properly recording. Every once in a while a child took their camera off, readjusted the settings, or turned the camera off accidently. Figure 3 provides an illustration of a child who took the camera off and passed it to her friend. Therefore, providing some basic guidance and directions to children to ensure proper treatment of the equipment is recommended.

Opportunities

Engaging Children in Video Analysis and Interpretation

While the *Sensory Tours* provided an opportunity for children to engage in data collection, video-stimulated recall discussions and other interactive activities were implemented to engage children in data analysis and interpretation. Video-stimulated recall has become increasingly popular in participatory research involving young children (Thomson 2008). The method "involves video-recording

Fig. 3 Three-year-old Rebecca removes her camera for a "readjustment."

an activity and then replaying the recording to the participants so that they can comment on matters of interest" (Rowe 2009, p. 427). Forman (1999) suggests that replaying videos for children can serve as a "tool of the mind," inviting children to interpret the meaning of their actions (p. 1). Video images can also stimulate esthetic and emotional responses (Thomson 2008).

Researchers have paired video-stimulated recall with semi-structured interviews (Rowe 2009), and reflective dialogues between children and teachers (Robson 2011). Using the video-stimulated recall for group discussions can promote intersubjectivity and collaborative reflection among children (Dahlberg et al. 2007). Rowe (2009) suggested that engaging participants in video-stimulated recall can provide an "insider's perspective" on actions, behaviors, and experiences and provide participants with opportunities to raise ideas that have not been previously thought of by a researcher (p. 434).

In this study, video-stimulated recall was used in group discussions to engage children in analyzing their experiences in the forest and for selecting their own research topics. The children collected video footage of their first few days in the forest using *Sensory Tours*. Afterward, the research team reviewed the video footage and identified short segments of children's activities that might be of particular interest to the children and that could be used to stimulate discussions. The video was played to small groups of 8–10 children in their classroom, and the following questions were posed: "What were you thinking about when you watched the movie? What did you notice? What did you hear? What did you see? What are you wondering about?" The children were also invited to draw pictures to represent and tell about their experiences. Their drawings and comments became part of a research big book collaboratively created by children.

Right away the children were excited about seeing themselves in the videos, pointing and saying, *"Hey that's me!"* or *"Where's me?"* They also identified others that they knew in the videos. The question prompts were useful for exploring what the children thought about their own experiences in the forest, below is a discussion about bugs:

Researcher: *What did you see and think about in that movie?*
Peter: *I wonder why the monsters have bugs?*
Researcher: *Okay, What about the kids and the bugs? Do you think about anything with the kids and the bugs?*
Cindy: *You smash ladybugs?*
Researcher: *You want to know if kids smash ladybugs?*
Cindy: *Yeah.*
Researcher: *Okay, do kids smash ladybugs?*
Cindy: *And then people say… you don't smash ladybugs.*
Researcher: *They do?*
Cindy: *There's a bug in my hair at the forest.*
Researcher; *How many got bugs in their hair in the forest? (Five children raised their hands.)*
Researcher: *Five kids got bugs in their hair in the forest. What else do you want to know about bugs? Anything else?*

Cindy: *You eat some bugs?*
Researcher: *You want to know if kids eat bugs?*
Cindy: *Yeah. Kids eat bugs!*
Peter: *Icky, icky! Don't eat bugs!*
Researcher: *How many of you eat bugs raise your hands? (Two children raised their hands.)*
Peter: *Its yucky eww…*
Peter: *No, no, we don't eat them. They are gross.*
Nathan: *Yeah, you eat them. (He nods his head). Some people eat spiders.*

In their conversation about bugs, the children pose questions about smashing, eating, and getting bugs in their hair. The children's expressive discourse of their experiences of bugs in the forest is enriched through their interactions with each other (Schutz 1967). While Peter expresses his disgust toward eating bugs, Calvin takes the topic serious by pointing out circumstances when people may really eat bugs. Cindy, on the other hand, expressed that she thinks eating bugs is funny. The interaction reveals the benefits of video-stimulated recall group discussions, showing how children reconstruct their experiences with one another.

In addition to bugs, the children also expressed an interest in other topics, including: rosebushes, sticks, *"X-marks-the-spots,"* and the forts, castles, and houses that they claimed in the forest. For instance, Nathan shared, *"Me, Paul and Heath, and Garrett and me and we investigating them and we also found a little fort and a little tree. And we kind of like it."* Many of the children also enthusiastically spoke about *"X-marks-the-spot."* Their interest in this topic was unexpected, emerging from the children who had invented the game during their forest play and exploration. The game entailed seeking and finding sticks that crossed in the shape of an X in the forest. Several children drew X-marks-the-spot pictures in the research book. Paul described his picture (Fig. 4) with Garrett.

Paul: *That's Garrett, that's Jared and that that's me and those are three X's and that's the squirrel peeking his head out the hole in the tree and its raining.*
Garrett: *And it rained on me? (Garrett points to the stick figure on the right.)*
Paul: *Yeah, it rained on you because you are not quite under the tree.*
Researcher: *What are the things on the ground?*
Paul: *These are wet leaves.*
Garrett: *And this is the tree.*

Through video-stimulated recall and other reflective activities (i.e., drawings), children expressed their interests in certain topics and reflected on their shared experiences of the forest. These topics were integrated into an overarching question that guided research inquiry and subsequent data collection and analysis activities: How do children experience (rosebushes, forts/castles/houses, bugs, and sticks and "x-marks-the-spots") in the forest?

Fig. 4 Paul's drawing of his friends and X-marks-the-spot

Conclusions

Children perceive and act upon the world differently from adults; therefore, research aimed at uncovering phenomenological meaning of children's experiences should consist of participatory methods that engage children in directing and interpreting their own experiences. This paper contributes to the literature on participatory research methods for young children by proposing that *Sensory Tours* is an unobtrusive authentic method for engaging children in collecting data of their own experiences. This method removes the need for an adult researcher, probing and prying into children's independent and social activities. Not only that, wearable cameras provide deeper insight into the life world of a child by revealing how children see, interpret, and interact with their environments. It is important for adults to consider children's perspectives of the world and to consider the features or people in the environment that may seem overwhelming or intimidating for children. *Sensory Tours* help to bring children's size into perspective, not only the physical dimensions but also the social dimensions and how adults can influence or threaten children's creative activities.

Wearable cameras (such as a GoPro®) are lightweight, durable, and resilient and can withstand the wear and tear of children and their day-to-day activities. In this way, they are perfect instruments for outdoor and environmentally focused research. As well, children enjoy wearing them and watching the videos that they collect. Pairing *Sensory Tours* with video-stimulated recall discussions enriches understanding of children's experiences. In this way, children provide insiders' views about their actions and interactions with others (Rowe 2009). In early childhood programs, the use of wearable cameras provides many opportunities to utilize children's interpretation of their experiences and their understanding of the various features in different environments. Teachers can use the opportunities afforded by *Sensory Tours* to enrich and extend children's learning experiences.

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