Editorial: Special Issue on Assumptions About the Concept of Childhood and the Roles of Children in Design☆

1. Introduction

The topic of this Special Issue of Child-Computer Interaction (CCI) is Assumptions about the Concept of Childhood and the Roles of Children in Design. The special issue builds on a workshop held at the Interaction Design and Children conference (IDC) in Manchester in 2016 [1,2] called Roles and Values of Children in Design. Lately, many researcher in the field have argued that they are concerned with values, assumptions and children's roles. Yarosh et al. [3] for example wrote an influential overview paper that examined the values held by the Interaction Design and Children (IDC) community. However, as we clearly experienced during the workshop, and we will show in this editorial, we all have different interpretations of these words, and use different definitions in different contexts, often without being aware that there may be other definitions. Indeed, Yarosh et al.'s overview provided an extensive analysis of papers published at the IDC conference, but at the same time the paper also used the word value and values in a variety ways: including values of the IDC community, values related to technological design and values related to the role of children in design. In CCI some researchers are concerned with investigating children's values, some want to provide value through their designs, while others may want to make children reflect on their own values through a particular design. This confusion about what we mean with values makes it troublesome to determine whether previously described approaches, models and methodologies are relevant for a particular study. Therefore, it becomes harder to move forward as a field. In this editorial we aim to distinguish between the different interpretations of the words 'value' and 'values' in the CCI community by providing a framework for approaches to working with value and values, and relate this to assumptions about children and the roles they can play in design. The papers included in this special issue shed some new light on the values of different (adult) stakeholders when designing for and with children, how these values relate to children's roles, and the value for children to participate in those roles.

2. Why consider assumptions and values?

According to Antle et al. [4] scholars in a wide range of disciplines have acknowledged the fact that assumptions and values

are embodied in technical systems and devices; they are implicated in products and systems [5,6]. Political theorist Langdon Winner [7] for example argued that classist values were built into the physical infrastructure of New York City, and Rachel Weber (Professor in Urban planning and policy) [8] argued that the design of air force training systems systematically discriminated against female pilots. In the context of Information Systems design Friedman and Kahn [9] describe several of the views on how such values can become implicated in design: embodied, exogenous and interactional. Values can be embodied meaning that designers inscribe their own intentions into the technology, which then determines specific human behaviour (also referred to as technological determinism). Values can also be exogenous, meaning that societal forces significantly shape how a deployed technology will be used, and finally the interactional position holds that whereas the features or properties that are designed into technologies more readily support certain values and hinder others, the technology's actual use depends on the goals of the people interacting with it. Furthermore, in a forum examining the future of HCI it was also suggested that it is important that we do consider values in design, because the changes in the world (such as shifting boundaries between technology and humans) make values a more core concern [10]. However, addressing values in design also provides opportunities for stakeholders to contribute values to the design. While attention has been given to understand adult stakeholders' values and how to elicit, develop and implement them during a design process [11], recent research has shown that children also have differentiated values, and that they are able to express them without relying on adults' help [12,13]. Furthermore, adult designers as well as other adult stakeholders may bring their own values and assumptions concerning children, childhood, and the role children can and should play in design. Most explicitly, the Participatory Design tradition involves values like empowerment and democratization, which requires active involvement of stakeholders such as children. Values thus play an important role in design, including design for children, but there are many different ways to consider values. In the next section we will delve deeper into how values in design for and with children are approached.

3. How are values in design for and with children approached?

Although we have used the word 'values' in a general sense, we have already hinted that the notion of values in design is not without problems. Within the CCI field, the terms 'value' and 'values' are used in many different ways. In Table 1, we will give

Table 1

Examples of articles in the CCI field addressing value or values.

Read et al. [14] examined the value of designing for and with children, referring amongst other things to value-centred design [15] and value sensitive design [16]. They based their work on value sensitive design as defined by Friedman and colleagues (e.g. [17]). Common to Friedman, they refer to values from an **ethical perspective in the design process**: why design projects for children are being done, and how the researchers/designers consider how they communicate with children. They developed the CHECk tool to help designers consider the ethical aspects of involving children in design. Van Mechelen et al. [18] took this work one step further and considered the use of the CHECk tool to negotiate values **concerning the project and its outcomes** with children.
Antle et al. [12] addressed the importance of children being able to discuss their values around sustainable development instead of offering fixed solutions to difficult problems. The concept of values in their work refers to the **discussion of values among children as a learning mechanism**, and "to learn not just facts but to eventually behave in line with social values" [12, p. 37].
Nouwen et al. [19] also point to values for children in their work with a value sensitive design approach towards parental software for young children. They state that the software developed must emphasize values related to how parents bring up their children using digital media aiming at control for safety, involvement, morality, independence and fun [19, p. 365]. In their work the attention is thus on **understanding other stakeholder's values concerning a design aimed at children**.
Isomursu et al. [20] tried to determine which value was created for all end-users, both children, teachers and parents, through the introduction of a new attendance control system in a school. In their work the attention is thus on **what the stakeholders can gain from using the product**.
Iversen et al. [11] argue for a process where values drive activities in Participatory Design. The work with values influences methods and stakeholder involvement. They see working with values as a dialogical process, where the design process facilitates the emergence of values, developing values and grounding the values. They have applied the process in collaboration with schools and musea. The values **influence the design process** followed, and the **product** as it is being developed.
Barendregt et al. [21] argue that participatory design activities involving children in the classroom context **should provide value** to the children, teachers, and parents because children are explicitly enabled to learn from their participation by adding learning goals and opportunities for reflection.

examples of research by some of the prominent researchers in the CCI field mentioning value/values within Child-Computer Interaction, showing the breadth of the topic.

Based on these examples, we will now try to disentangle the different approaches to considering values in CCI.

Value or Values: First of all, there is a difference between the meaning of the word '**value**' and the word '**values**'. **Value** often refers to the worth of something, whereas **values** refers to what is important in life. The objective view of 'having value' can be linked to an economic view of value, and the subjective view of 'being of value' can be linked to a sociological view of value. Concepts and definitions of value in the context of innovation have thus been explored in economy, psychology, sociology and ecology [22]. This use of the word 'value' is closely connected to how 'value' was initially used by Cockton [23], and which was renamed to 'worth', meaning **what a technology brings to its end-users**.

Focus on the process or the product: In the design context, value or values can also be connected to two different aspects of the design: as the **product** of design providing value or expressing values, and as the **process** of design contributing to values, expressing values, or providing value. The notion that values can be embodied in design, as expressed by Friedman and Kahn [9] relates to the product's values, while the notion of empowerment, which forms the basis of PD, relates to the process' values. A very specific version of values embedded in the product can be found in Antle et al. [12] where the intention of the product is to make children aware of their personal values. This means that one of the embedded values of the designers is that children should be taught about values.

Focus on designers' value(s) or stakeholders' value(s): Finally, as already hinted at in the previous section, we can consider value or values from the **perspective of the designers** and/or from the **perspective of the stakeholders**. As an example, involving children in the design may be of value to the designers because the children contribute with useful knowledge to create a more interesting product, or the design process itself is of value to the children and teachers, e.g. because they learn something about design. As den Ouden [22] has pointed out, stakeholders may exist on many different levels, from users (children, parents, teachers), to organisations, the ecosystem, and society.

While the classification provided above gives the impression that distinctions can be made easily, it needs to be noted that there are several dependencies. For example, creating value in a product or process for children is easier when one is aware of the children's values, and designers aiming to create value for children probably do so because of their values related to involving children in design or designing for children. Based on what different researchers focus on when talking about assumptions or values, they may also use different approaches, methods and models.

4. Values and roles

While we have addressed values as expressed or embedded in a product for children, designers' values and assumptions also determine (partly) which role children are given during the design process. Although the idea of roles was first described by Druin [24], others have lately proposed ways to more accurately define children's actual involvement in the design process instead of generally speaking of children's roles. Barendregt et al. [25] for example proposed the Role Definition Matrix, which clarifies more exactly how children were involved in the design process in terms of the phases in design (Requirements, Design and Evaluation) and the activity in relation to the designer (Indirect, Feedback, Dialogue, Elaboration) during these phases. Recently, Iversen et al. [26] have specifically discussed the connection between children's roles in the design process and the values of political participatory design when they propose a new role for children: the child as design protagonist. The concept of design protagonist "extends the concern to empower children into developing technology, critically reflecting on it, and acting upon it". When acting a design protagonists "children are the main agents in the design process as they engage with authentic design problems". Furthermore, in line with Barendregt et al. [21] who proposed a way for children to learn through participation in design activities, this protagonist role suggests "that through their engagement in design, children develop skills in designing and reflecting on technology, and that these skills empower them to make more informed decisions about technology in their lives".

Investigating how designers' values and assumptions regarding children and the design process influence children's actual involvement in the design process, could provide new knowledge for the CCI field. For example, it could be investigated in more detail which kinds of activities in which phases are most beneficial for children as design protagonists.