On Space and Place in Mobile Settings

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Abstract. Space and place are often assumed be mutually dependent physical and social characteristics of context. However, in mobile settings, this assumption can be contested. This paper presents a mobile functional system comprised of a parent, a baby and a cart that exemplifies a situation where the material and bodily resources carried in the system form an important space in itself. Analysis on how parents use these resources leads to two theoretical implications: in certain mobile settings, (1) people can carry the space with them and configure it if needed, and (2) place can be chosen by the user, without changing the resources provided by the space. Therefore, in mobile settings, space and place are sometimes only loosely coupled, which can be benefited in system design.

1 Introduction

An often-used distinction between the characteristics of space and place used in human–computer interaction research is that whereas space refers to the physical characteristics of the context, space covers the cultural dimension [1]. This theorizing is followed by an assumption that places "are" in certain spaces [2]. For instance, Dourish provides an example of a space like a shopping street being a different sort of a place at different times of the day [1]. Concepts of space and place seem to be mutually dependent and co-occur in the context, but how generalizable is this assumption?

This paper challenges the assumption with an analysis of space and place in mobile contexts. The setting of interest is the daily life of parents and their babies.

2 The Baby Cart System

The functional system of the baby cart has of the components with the following roles:

- The baby, who is the central player in the system. Most of the activity in the system is focused on maintaining the well-being of the baby.
- The parent, who takes the responsibility for managing the arising situations initiated by the baby. This task is very attention-taxing and difficult to manage, as the baby requires constant care. In many cases the reason for crying can be guessed by narrowing down the set of possibilities (such as hunger, tiredness or flatulence), but sometimes diagnosing the reason is not possible.

A Parent feeds baby with rice cake to fill baby's stomach and keep her sleeping.

B Parent carries a baby who did not accept staying in the cart.

C Parent adjusts the cover to block the wind.

D Parent gives a dummy to the baby.

E Parent walks on the side of the cart, in order to shadow the baby from sunlight that could wake him up.

F Parent raises the baby to a half-sitting position.

Fig. 1. Situations of parents nurturing their babies.

- The cart, which is both a container for material resources that the parent can use, and a means that allows mobility for the system.

3 Analysis

Parents and their babies were studied as a part of a small Wizard-of-Oz study (N=4) that was related to development of a new kind of a context-aware mobile service. However, as the service itself is not in the focus of this paper, we concentrate on the interactions within the system and the outside world.

Babies like small, constant movement. Keeping the cart in small constant motion is therefore the standard management strategy. Motion can be achieved by walking with the cart, or when not moving, rocking it back and forth with a hand. In addition, interacting with a baby is important in itself, and it provides good spirit for both parties.

Parents also know smaller tricks that can turn the situation into a favorable direction: giving a dummy for the baby to suck, adjusting the amount of clothes, adjusting the cover of the cart, lifting the baby to a half-sitting position, giving something small to eat for the baby (such as rice cake, in the case of an older baby), or carrying the baby in the lap (see Fig. 1). These actions are close in nature to *move experiments,* that is, conversation with the situation where a person makes experimental moves and then assesses whether the result satisfies him/her [3].

3.1 Space as a Mobile Configuration of Resources

For the baby cart system, the primary characteristic of space is that it is a mobile space: a configuration of material (clothes, toys etc.) and bodily (being able to interact with the baby, use body to occlude sunlight, or breast-feed the baby) resources that the parent has at his/her disposal. Such a mobile configuration is easily controllable albeit often limited in functionality. There is also the surrounding environment that can also be drawn as a resource to the situation. For instance, if it is raining, parent may decide to move indoors. However, for the contingent needs of the baby, resources in the mobile configuration are often more easily ready at hand and thus more relevant.

3.2 Place as a Determinant of Appropriate Management Strategies

For the baby cart system, different places allow different management strategies. Some places are not intended for the system at all (as exemplified with signs to leave carts outside the building), while other places let parents to change diapers, feed the baby, or let him/her crawl and walk freely in the space. Places like streets, parks, cafés, shopping malls, shops, and lawns differ in this aspect. This entails a tension between convenient nurturing and conforming to the behavioral frame of the place.

What is notable here is that while social norms cannot be altered, the parent can *move the baby cart from a place to another*: from a shop to a street to a suitable café. This way he/she is able to get to a place that has a suitable behavioral frame that lets him/her nurture the baby conveniently. Of course, parent may also face situations where she is obliged to stay in a suboptimal place. Part of the task is also to proactively use routes and walking areas where switching between suitable places is easy.

4 Discussion

The contribution of this paper is in charting what mobility entails to concepts of space and place. Following theoretical implications have been drawn. In mobile settings,

- space can be carried with the user. That is, space is not something where the user steps in when he/she arrives at a certain physical context, but something that can be controlled, configured and managed; and
- place can be switched to another one by moving in the physical space, while still retaining many of the material resources of the space. For using these resources, the new place may allow more convenient practices than the old one.

While these implications do not directly contest the idea that "place is in space" [2], they show that in mobile settings, space and place are only loosely coupled concepts. These findings result e.g. in the following design implications: Technology should

- allow for use in multiple places, since switching from a place to another can happen easily. Different interaction strategies with the device, from withholding from use gracefully to full-fledged efficient use, should be enabled; and
- enabling flexible switches between places by making the mobile space be highly portable. An obvious example is that since a carrying a laptop provides a mobile computing space for the user, the laptop should be easily configurable for wireless connectivity in different places; and
- facilitate proactive configuring of space. For instance, when leaving home, help user to equip the mobile space with the appropriate resources.

These implications can be useful for contexts where the physical location is not an issue and switching the place is possible. Many leisure activities like shopping and spending time with friends meet this requirement. Also activities where users are moving with mobile equipment similar to a cart are relevant.

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References

1. Dourish, P.: Where the Action Is. The Foundations of Embodied Interaction. The MIT Press, Cambridge, MA (2001)
2. Harrison, S, Dourish, P.: Re-place-ing Space: The Roles of Place and Space in Collaborative Systems. Proc. CSCW'96, ACM Press, New York, NY (1996)
3. Schön, D.A.: The Reflective Practitioner: How Professionals Think in Action. Basic Books, New York, NY (1983)