Withshare:  
A Mobile Application to Support Community Coproduction Activities

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ABSTRACT  
Coproductions are reciprocal activities that all parties are actively engaged in and create synergies that cannot be produced by one party alone. Coproduction activities are important for community building, as the social interactions among community members create social values such as new social ties, trust and reciprocal recognition. Mobile technologies bring new opportunity for coproductions by supporting small-scale reciprocal activities that are location and time sensitive. In this article, the authors introduce and study WithShare, a smartphone application that helps people to organize such coproduction activities. A 3-week user study with 38 young adults in a local community of college students shows WithShare facilitates the coordination of opportunistic and lightweight reciprocal activities in their daily life. The results highlight potentials of coproduction activities in strengthening existing social ties, and establishing new weak ties in the local community. The findings suggest important design implications for mobile technologies to support coproduction activities.

KEYWORDS  
Case Study, Coproduction, Design Research, Mobile Local Community, Social Connections and Interactions

INTRODUCTION  
Coproductions are reciprocal activities where there is no sharp boundary between providers and recipients, and all parties are actively and directly engaged (Carroll, Chen, Hanrahan & Yuan, 2016). A coproduction activity is more than a simple collaboration, and emphasizes that the interactions between participants create synergies that cannot be achieved by one party alone. Many reciprocal activities in our daily life are coproductions: for example, doing exercises together, walking dogs together, sharing a ride, or group study. These daily activities are “symmetric” coproductions, because what the initiator does for the joiner is the same as what the joiner does for the initiator. The initiator and joiner coproduce the activity experience, and their interactions during the activity produce social synergies such as personal satisfaction, enjoyment, respect and mutual trust (Van & Steen, 2014). Through generalized reciprocal exchanges (Molm, 1994), these person-to-person social values flow and propagate through chains and community networks, and multiplicatively lead to broader social goods of enhancing social capital and sustaining local communities (Carroll & Bellotti, 2015). Therefore, on the community level, participants coproduce the development of local communities, enhancing community connections and re-energizing neighborhoods (Cahn, 2000).

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In this paper, we explore the opportunities to support coproductions through mobile technologies. The reciprocal activities that people coproduce in their daily life, such as doing physical exercises, group study and eating out, are usually lightweight and opportunistic, without planning ahead. They are also location and time sensitive, and require real-time coordination. Mobile technologies, with the affordances of increased mobility and immediacy (Leung & Wei, 2000), provide opportunities for coproduction activities by supporting such interactions. More specifically, we design and study WithShare, a smartphone application that facilitates coordination of daily reciprocal activities for people to coproduce. Through WithShare, people can invite others in their immediate vicinity to join the reciprocal activities on which they want to collaborate, or which they prefer not to do on their own. These activities are usually something that people are thinking of doing now or in the very near future. In order to analyze how people organize coproduction activities using WithShare, we examine a case study in a local community of college students who were taking three different classes from the same major. The college students are very familiar with mobile technologies and they spend their daily life in a tightly co-located community. From a three-week user study with 32 young university students, we find WithShare helped participants to collaboratively organize reciprocal activities in their daily life. By engaging in the activities coordinated through the app, participants gained mutual benefits, expanded their social circles and were connected with new social ties in the community.

The contributions of our work include: 1) a design study to support reciprocal activities through the lens of coproductions, which has not been reported on in previous literatures; 2) an exploration of leveraging affordances of mobile technologies to broaden the range of community coproduction activities; 3) insights on how coproduction interactions lead to social synergies in supporting community building in the case of a local community of college students. In the following sections, we will first provide a review of previous research and studies about coproduction, related work about supporting collocated interactions with mobile technologies, and literature about social exchange in the context of community building. We then describe the design and implementation of WithShare. We discuss our findings in the user study around how college students used WithShare to coordinate coproduction activities, and the social synergies (including companionship, peer-support and new experience) from coproduction interactions. Findings from the study also point to design implications for leveraging mobile technologies to elicit more opportunities for coproduction interactions.

**BACKGROUND**

In this section, we first introduce the theoretical framing and applications of coproduction. We then review famous examples of local exchange systems, and their role in supporting community building. We also review related work on mobile systems that support face-to-face interactions.

**Co-Production**

The concept of coproduction was first coined by Nobel Prize winner Elinor Ostrom in the 1970’s. In one of her lectures, Ostrom used this term to explain the counterintuitive phenomenon of decline in public safety when police officers in Chicago moved from patrolling on foot to patrolling in cars. In her analysis, even though police could cover more territory in patrol cars, their relationships, contacts with, and knowledge of residents diminished because they didn’t circulate on foot among the residents. Therefore, the police and residents were less able to coproduce community safety. Coproduction emphasizes that people used to be considered as “recipients” are valuable and should play active roles: by integrating their expertise and knowledge, people can achieve the outcomes that benefit stakeholders of both sides (Bovaird, 2007). Typical examples of service coproductions include healthcare (Van & Steen, 2014) and education (Porter, 2012): health and education cannot be simply delivered, instead, patients or students need to collaborate closely together with doctors or teachers to achieve an outcome good for both. Coproduction is also increasingly important for the relationship
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