

2015

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Recommended Citation

Roy, Indrani; Cranefield, Jocelyn; and Toland, Janet, "Collaborative Consumption: A New Zealand Case study" (2015). 2015. 4.
http://aisel.aisnet.org/sprouts_proceedings_siggreen_2015/4

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Collaborative Consumption: a New Zealand Case study

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Abstract

In a world where there are increasing concerns of resource scarcity, the emergent phenomenon of ICT enabled Collaborative Consumption Services (CCS), is becoming relevant as it presents a more efficient allocation of resources and is associated with the generation of social capital. There has been little research on CCS and how social capital is generated. This study aimed to address this gap in research through the use of a provisional unifying model to explore how social capital outcomes are generated amongst individuals participating in peer-to-peer CCS. Using an interpretivist world view, in-depth interviews were conducted with eight CCS users. Forms of bonding and bridging social capital were found to have been formed as a result of various interactions amongst CCS users, which produced different benefits such as connectedness, informational benefits and more efficient future transactions. This benefits spurred the CCS users to return to using the CCS or other CCS, amplifying social capital outcomes and thus creating a virtuous cycle. Technology was found to have performed two important roles during this process, one of gatekeeper and of relationship maintainer. This research project aimed to generate greater awareness and understanding of CCS which will hold implications for academics, local government and CCS designers.

Keywords: Collaborative Consumption, New Zealand, Social Capital, Community, Information Systems.

Introduction

The United Nations has estimated that by 2025 the world population will swell to 8.1 billion people, raising serious concerns about shortages in key resources such as food, land and fuel (The Associated Press, 2011). Populations in urban areas will bear the brunt of that scarcity, as this is where populations tend to be most dense (Gansky, 2010). Collaborative Consumption Services (CCS) present an alternative consumption model where consumers, enabled by network technologies, share products and services, making more efficient use of scarce resources. CCS underpin the so-called sharing economy (Cohen & Kietzman, 2014; Sundararajan, 2013).

It has been claimed that the use of CCS creates social capital (Botsman & Rogers, 2010). This research explores how Information and Communication Technology (ICT) enabled CCS contributes towards creating socially cohesive and sustainable communities through social capital generation amongst participating individuals. The overall objective of this study was to explore how social capital is generated through the use of ICT enabled CCS.

Collaborative Consumption Services

This study uses Botsman & Rogers definition of CCS as a consumption model based on sharing and access to products or services. CCS can be conceptualized into three types:

- a) Product Services Systems where private/company owned products are shared or rented from peer-to-peer in the form of a service. The aim is to optimize resource usage and reduce the burden of ownership e.g. carpooling;
- b) Redistribution Markets where pre-owned goods no longer needed can be redistributed. The aim is to reduce waste e.g. Freecycle, clothes swap;
- c) Collaborative Lifestyles where people with similar interests gather together to share and exchange less tangible assets such as time, space, skills and money e.g. Airbnb, TaskRabbit.

The underlying principles of CCS include the availability of enough critical mass in a system to make it self-sustaining and ensure there is enough choice for members, having products or services with “idling capacity”, unused products or services such as time, skills and space, belief in the value of participating in a community of shared interest, and trust between strangers.

The CCS that enable the sharing economy are mediated through digital platforms that promote widespread peer-to-peer commerce and reduce traditional information asymmetries (Cohen & Sundararajan, 2015). ICT can be seen as contributing to the underlying principles of CCS by facilitating weak ties (Granovetter, 1973) that lead to wider diffusion of information. For example, news about a clothing swap can be spread widely within a neighbourhood of people who do not know each other, resulting in a more connected social network. Online social networks enable the matching of idle resources with potential users, while reducing the transaction costs associated with redistribution efforts. ICT also helps potential users overcome the uncertainty involved in using a CCS; for example, home sharing and exchange services typically propagate the positive or negative experiences of users and hosts. Online reputation systems, aggregated ratings and online histories of transactions may also be used to further build trust.

Social Capital

Social capital has a wide variety of definitions and could be regarded as an evolving concept. An OECD definition is: “*networks together with shared norms, values and understandings that facilitate co-operation with or among groups.*” (Organisation for Economic Co-operation & Development, 2001). The term encompasses connections among individuals, the social networks that develop and the norms of reciprocity and trustworthiness that arise from them. Social capital has been traditionally viewed as having both a bridging and a bonding dimension. The bonding dimension is inward looking and reinforces exclusive identities and homogeneous groups, which can be very useful for specific reciprocity and mobilizing solidarity. Bonding is facilitated by homophily, the tendency of people to interact with their own kind; this may be as a result of preference, or the result of opportunity constraints. The bridging

dimension is outward looking, and includes diverse social groups. Xavier De Souza Briggs noted that while bonding social capital is good for getting by, bridging social capital is essential for getting ahead (cited in Putnam (2000) p 23).

CCS and Social Capital

CCS can present a more efficient resource allocation and consumption method while simultaneously building social capital. It has been claimed that social capital is created across all forms of CCS (Botsman & Rogers, 2010). The argument is that social capital is increased when our needs for services and information are shared, by building and/or strengthening relationships with those around us. For example, in a study exploring how social capital benefitted from CCS, it was found that community well-being and social networks underwent a prominent increase (Daniel, Horwitz, MacPherson, & Prato, 2010). Redistribution of resources can result in community building; for example, the face-to-face interaction that occurs during activities such as clothing swaps can build and enrich connections. Collaborative lifestyles involve the exchange of intangible assets such as space, knowledge and skills. Results from a survey of over 1000 Couchsurfing members indicated that those who participated in engagement activities such as weekly meet-ups or language conversation classes felt a stronger sense of community than members who had only communicated via online tools (Rosen, Lafontaine, & Hendrickson, 2011). While the role of ICT in enabling CCS is important, it is not clear how ICT, CCS and social capital work together. Therefore, the research question that this study aims to address is:

How does participation in ICT enabled CCS generate social capital for individuals?

Research Methodology

This study takes an interpretivist world view, which is based on the position that there is no universal truth and reality is seen as a subjective social product, constructed and interpreted by humans, according to their beliefs and value systems (Klein & Myers, 1999). It attempts to understand phenomena through the meanings people assign to them. Interpretivism was seen as a suitable philosophical approach for investigating and gaining a broader understanding of how rich social interactions and experiences occur due to ICT enabled CCS and how these experiences contribute to social capital.

Eight semi-structured interviews of around 40 minute's duration were carried out with participants from Couchsurfing, a carpooling CCS, and a food foraging CCS. A snowballing strategy was used to identify participants located within 'hidden' population groups (Hennink, Hutter, & Bailey, 2010). Participants were required to be repeated users of the online CCS for more than two years. This is because social capital is known to be developed as a result of repeated interactions (Cho & Baek, 2012). The eight individuals came from three CCS representing all three types of CCS according to Botsman & Rogers, more specifically: carpooling groups (product service systems), food foraging (Redistribution Markets) and Couchsurfing (Collaborative Lifestyles). These groups were targeted as they were popular forms of CCS, relating well to Botsman & Roger's typology as explained above. Further information relating to how these groups were determined to be CCS is shown in Table 1.

Collaborative Consumption underlying principles	Couchsurfing	Food foraging	Carpooling
Critical Mass	Sufficient people are needed to ensure choice (people can choose who to host and who to stay with) and to sustain the organization.	Sufficient people are needed to sustain this community movement and keep it growing.	Given that people require rides to and from various locations, a variety of available rides increases the probability of meeting a user's requirements
Idling Capacity	Extra accommodation space is available to be redistributed	Excess fruits, herbs and vegetables are available for redistribution to individuals and organizations.	Spare car seats are available to be shared through the offer of rides to others
Belief in the Commons	The more people that join, the more value it presents in terms of more choice of places to stay and further opportunities to network and share information	The more people that join, the more information they can share about locations of excess produce and edible plants which provides value to everyone.	The more people that join the carpooling network, the more likely it is that the information and ride requirement of a person will be met.
Trust between Strangers	Very important as it involves strangers sharing space together.	Required as foraging involves strangers coming to one's house to pick excess produce.	Required as one shares rides with strangers.

Table 1: How three CCS apply across the underlying principles of Collaborative Consumption

Three rounds of coding were conducted with subsequent rounds occurring as a result of findings in the previous rounds. The first round involved inductive codes to initially categorize transcripts. Words which were repeated and patterns between those words were noted using in vivo codes. Alongside this initial stage of coding, memos of observations on the transcripts were written in order to further refine codes and start developing themes. This inductive coding was sensitized by knowledge of the literature (Glaser, 1978). The second stage used deductive codes that came from a codebook created for this purpose. Deductive codes for social capital indicators were created through reading qualitative research conducted on social capital and further codes were developed for CCS related terms. Using these deductive concepts, the transcribed data was reviewed for instances of meaning that related to these codes. Another round of coding occurred once it was observed in the data that events seemed to occur in larger processes. It was concluded that processes and outcomes were occurring, hence coding began to identify these. Descriptive codes were then shifted into higher level processes by merging them into higher level categories that described the process of social capital formation.

Findings

Data analysis resulted in development of a process model for social capital formation, consisting of four key stages (see Figure 1): finding and connecting with people, participating in the CCS, gaining social capital and attaining benefits. Forms of bridging and bonding social capital were produced as a result of various interactions between individuals participating in CCS and produced benefits in three main categories: connectedness, informational and more efficient transactions. This led to users re-using the CCS and in some cases to the use of additional CCS, amplifying social capital outcomes, forming a virtuous cycle. Technology in the form of CCS online means played the dual role of gatekeeper to CCS and relationship maintainer. ICT enabled the creation of critical mass, facilitated allocation of idling resources and contributed to the creation of trust between strangers.

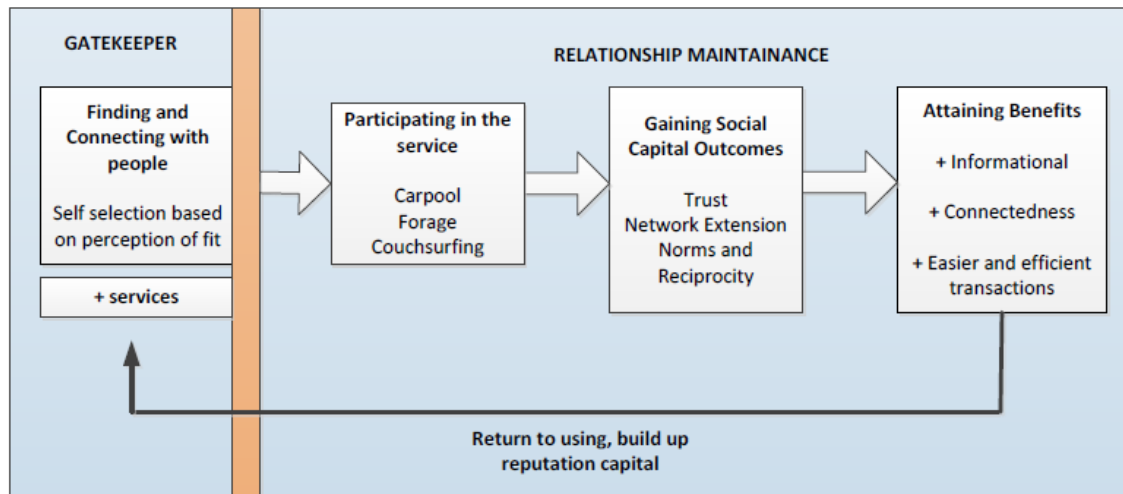


Figure 1: A process model depicting social capital generation within Collaborative Consumption Services in a virtuous cycle

Finding and Connecting with People

CCS online platforms such as Facebook and websites facilitated the generation of bridging social capital in the first step of the process model. By providing a platform where like-minded people could gather and have the opportunity to interact together, CCS online platforms created weak ties. For instance, Mary (pseudonym) first got to know about a Dutch Couchsurfer, Adrian through the Couchsurfing website as he was interested in Iran (where Mary was from), and they started to converse online. Through the ties they built online, Mary ended up staying at the Adrian's home when she travelled to the Netherlands. This is supported by Wellman's argument that the Internet creates weak ties (Wellman, Haase, Witte & Hampton, 2001).

By helping people who needed resources with those who had (or knew about) idling capacity, CCS platforms essentially closed structural holes through the creation of weak ties. This weak tie creation is what enabled an efficient resource allocation outcome. Informational and resource needs were met by those who needed them regardless of whether there were any existing ties between these people. This is exhibited by the Couchsurfing website connecting Mary with Adrian, whom she would not have known otherwise.

The trust mechanisms in the online platforms, such as the Couchsurfing website and Facebook for the Foraging group, brought effects that were similar to closure in terms of restraining opportunism. Through online reputation systems and the history of people's past activities, individuals in the social network of the website were able to observe the outcomes of the actions of others, creating norms that could monitor or guide behaviour. An example of this was Mary's perception that through the feedback on the hosts' user profile from guests who had stayed with them, she could get a sense of who she was dealing with. Considering that this feedback was displayed prominently on the user profiles, in the form of individual reviews and aggregated figures, and was available to see by all members of the Couchsurfing community like Mary, this was an incentive for both hosts and guests to behave cooperatively. Failure to do so would mean their actions would be displayed publicly on their profiles, affecting their ability to conduct future Couchsurfing interactions.

People's user profiles could also provide a sense of common ground and interactions which can lead to the development of thin trust, which in turn helped people commit to actual, offline interactions. Tim, a carpooler, specifically said that the knowledge of one person's driving experience to a particular snowfield on their user profile helped him trust their driving ability, as certain ski fields were tricky to drive up to. This gave him greater confidence in committing to sharing a ride with this person.

Essentially, the online platforms functioned as a gatekeeper for the users wanting to use Collaborative Consumption Services. It enabled them to find suitable people to perform transactions with in a convenient manner and for those who were cautious about trusting strangers, CCS online platform provided features that could allay their uncertainties, encouraging them to commit to offline transactions. All the CCS users acknowledged that without CCS online platform, their connection to and usage of the Collaborative Consumption Service would not have been possible, or would have been far more time- and effort-consuming.

Participating in the service

Both bonding and bridging social capital were created through participation in CCS services.

CCS presented opportunities for potential bonding social capital to develop. As per Botsman & Rogers, social capital is increased when we share, building and strengthening relationships with family, neighbours, friends and total strangers (2010, p. 180). The weak ties created online by technologies had the opportunity to extend further or be reinforced by face-to-face meetings which was required in these three CCS. These face-to-face interactions could potentially produce closer relationships, generate thicker forms of trust and generalized reciprocity that is representative of bonding capital due to the opportunity CCS presented for like-minded people meeting each other and sharing or exchanging resources.

Instances of bonding social capital were generated for participants in every CCS except for carpooling. For example, Debbie developed a strong friendship with another Couchsurfing traveler, to the extent where she was a Master of Ceremony at her wedding and supported her through her divorce subsequently. Close friendships such as this are linked to emotionally close relationships such as those found with family and close friends characterizing strong ties found in bonding capital (Putnam, 2000; Valenzuela et al., 2009). Similar close friendships were formed by three other participants, Mary, Mark and Kelly.

Another form of bonding social capital generated was the feeling of connectedness and the sense of belongingness and identity that this produced. Kelly, a forager, described how actively participating in the foraging service had given her a strong sense of identity and belongingness to others in the community on the basis of commonly held beliefs that she held. Mary described a similar feeling of connectedness with other Couchsurfers, feeling that *“she could be friends with any of them in a matter of minutes and she would help them and they would help her out”*, on the basis of sense of community. This reinforcement of exclusive identities within a homogenous group is a form of bonding social capital (Putnam, 2000; Valenzuela et al., 2009). No such instances were reported by any of the participants in the carpooling CCS. As mentioned earlier, it was found that no relationships or networks extended outside of carpooling for any of the carpooling CCS users. This anomaly can be explained by the lack of support for strong tie creation. According to Wellman (1992 as cited in Kavanaugh, Reese, Carroll & Rosson, p. 3), strong ties are characterized by: a voluntary investment in the tie and a desire for companionship with the tie partner, an interest in frequent interactions in multiple social contexts and finally, a sense of mutuality in the relationship. Few instances of this were found in the cases of the carpooling participants, with one or more the strong tie characterizations missing. For example, Tim said *“all of us in the carpool are only doing it because we cannot afford to travel on our own”*. There was no voluntary investment in ties in this case. Harriet, although interested in companionship, felt that the duration of interaction was too short for a meaningful interaction to develop, with most interactions occurring during a one-off two hour drive. Phil's relationships did not extend outside of carpooling because he found little common interest with those who shared rides with him, hence mutuality did not occur.

Therefore, it can be concluded that without these requirements of strong ties not being met, bonding social capital outcomes such as close friendships and identities cannot be created or sustained. This suggests that some CCS users may not gain access to benefits such as strong levels of support or the sense of identity and belongingness which results from connectedness.

Network closure has been known to produce the following benefits: facilitation of norms and sanctions which restrain opportunism, breed trust resulting in more cooperative exchanges (Coleman, 1988) and also creating homogenous groups and social cohesion (Coleman, 1988; Shen et al., 2012).

Network closure took place in the Foraging Service where initially weak ties created online were strengthened when CCS activities took place through meetings requiring face-to-face meetings such as

foraging picnics and skill sharing workshops. These activities in some situations created cohesive ties, but generated different forms of benefits as opposed to cooperative exchanges. Cohesive ties resulted in close friendships and feelings of belongingness. Identities starting forming on the basis of commonalities in beliefs and goals such as the desire to help others and reduce wastage. This is in agreement with network closure creating group cohesion and homogenous groups (Shen et al., 2012). However, there was little emphasis placed by the Foraging service users on the impact of this network closure on resulting in greater cooperation and restraining opportunism. This may have been because these CCS users were already satisfied with the level of cooperation that existed due to the existence of weak ties.

Although no instances of bonding social capital were found in carpooling, one instance of network closure occurred for Phil. Phil was involved in a carpooling system where everyone would take their turns in bringing their cars, picking up and driving others in the carpooling network. This was a system requiring a high level of cooperation and as there was no money involved in these transactions, it bought a degree of uncertainty as to whether such cooperation would be forthcoming. Given that some of the members of the carpooling system were known to each other meant that members were incentivized to display a cooperative image and conform to the requirements of this reciprocal system (Gargiulo & Benassi, 2000). Failure to do so would mean they would be at risk from suffering damage in reputation in the eyes of the carpooling members that knew them (Coleman, 1988). This facilitated cooperation by diminishing the risk of opportunism, thus increasing the reliability of the system which further engendered particularized trust (Shen et al., 2012) even if cohesion did not result. Thus these cohesive social ties facilitated particularized trust and cooperative exchanges, even if these ties themselves did not strengthen or turn into friendships.

Network closure delivered different benefits to different kinds CCS. It brought a greater amount of cooperativeness for effective collective action, thereby increasing particularized forms of trust for Phil while he carpoolled. For more loosely tied communities such as the Foraging community, it brought about a greater sense of connectedness, and strengthened ties resulting in greater social cohesion but did not necessarily result in greater amounts of cooperation or collective action than previously existed.

The creation of bridging social capital was signified by the creation of norms of generalized reciprocity (NoGR) (Putnam, 2000) and norms of generalized trust as per Lancee (2008). NoGR were formed for both the Couchsurfer users, with Debbie describing how she felt she had Karma to repay after experiencing her hosts generosity in Amsterdam. As her hosts' hospitality went beyond Debbie's expectations and the hosts did not expect money or any form of reciprocity, she felt she had to repay this generosity by hosting and helping other Couchsurfers. The host's actions described a situation of norm of generalized reciprocity occurring with assistance provided with nothing specific being expected in return (Putnam, 2000) which spurred Debbie's gratitude and generous behaviour with others. These produced a cycle of such interactions, with each interaction imbued with empathy, thus generating a greater amount of cohesion and trust which fits in with the belief that trust arises out of NoGR (Bridger & Luloff, 2001).

NoGR were not generated in Carpooling. This was attributed to the fact that money was involved in carpooling related transactions. Since money was provided in return for the service, this represented a form of specific reciprocity and a certain level of security that cooperation would occur which did not necessitate in the creation of generalized reciprocity. Debbie, in a discussion on the merits of Airbnb, a commercial version of Couchsurfing described that due to paying, you "*don't feel so awkward about staying a stranger's house, you feel like, sweet, I have paid for this room, I can relax*". She did describe the downsides of this however, saying "*but then again, it doesn't foster those kinds of relationships*". This represented that relationships that develop through norms of generalized reciprocity are less likely to be developed in commercial transactions, which did apply in the case of carpooling as no CCS user experienced any extension of networks or sustained relationships.

Norms of generalized trust were created across Couchsurfers and Foragers. Kelly described how seeing the generous actions of a young man who had foraged apples to donate to a school for the children's breakfast made her less cynical of people's motivations and made her realize that there were other people who like her were interested in sharing. It made her faith in people increase. Similarly, Mark described how the experience of strangers coming in to pick walnuts off his garden made him open up towards the idea of trusting his people in general. It encouraged him to open his doors to strangers and to open up in general despite living in a notoriously unsafe neighborhood. Both cases described a situation of generalized trust occurring with their general level of trust in people increasing as per Lancee (2008).

Some implications raised were that NoGR and generalized trust were both important for CCS to function both effectively and efficiently. NoGR rests on the expectation “I help you now, the favour will be returned sometime in the future” (Bridger & Luloff, 2001; Putnam, 2000). This “combination of short- run altruism and long-term self-interest makes everyone better off” as it reconciled self- interest and social solidarity (Bridger & Luloff, 2001) which worked on reducing opportunism and generates trust, facilitating cooperation for mutual benefit (Putnam, 2000). For instance, Couchsurfing functioned successfully with NoGR as people’s general actions represented short term- altruism, being conducted with a self-interested thought of experiencing the same generosity from someone else, there by facilitation cooperation during transactions.

This enabled CCS to function efficiently as not every transaction needed to be balanced immediately. Generalized trust eased transactions, by making people more open-minded and appreciative of others’ actions facilitating a sense of connectedness, making future transactions easier to conduct. Both these combine to create a situation where the need for formal policing and surveillance was reduced.

While all users had gained new knowledge and learned new information through their participation in various CCS activities, it was only users from the Foraging service and Couchsurfing who said that they were able to derive benefits from information they had gained.

This can be explained by Obstfeld’s concept of ‘*tertius iungens*’ brokerage orientation. Mark spoke of becoming involved with other CCS groups as a result of his participation in the Foraging service. This afforded him a brokerage position between these different organizations, through which he could transfer his knowledge gained from one organization to another. By connecting members of these different organizations, he gained access to funding, contacts and a physical space to build and house his own CCS. He attributed these benefits to the people he met and the social relationships he created through his involvement in these groups.

Couchsurfers Debbie and Mary described gaining knowledge which benefitted them by improving their traveling experiences which they said they otherwise would not have gotten. Mary for instance described how her knowledge of the Netherlands and her experience travelling there felt like she was ‘at home’ as she had access to information and people through her Couchsurfing host’s personal network of family and friends. This represented a closing in structural holes between herself and her host’s personal network, as her host had facilitated that connection through which she was able to access information and gain new friends.

This was in contrast to all the CCS users in Carpooling who, while gaining new knowledge from those they carpoled with such as learning about new cultures, were not able to make use of it to improve their CCS experiences or their personal well -being.

The implications are that social networks comprising of sustained ties were important in order to produce informational benefits that could improve CCS users’ personal wellbeing and experiences.

Gaining Social Capital Outcomes and Attaining Benefits

The CCS online means (OM) played the role of a gatekeeper in the first process of finding and connecting people by enabling the formation of bridging ties. This section will describe how the CCS OM continued contributing to social capital generation during the third and fourth processes of the model. CCS OM played an important role in maintaining both strong and weak ties that characterized the bonding and bridging capital formation for CCS participants described in the earlier section. The OM were also a source of social proof as they could disseminate positive experiences that one had experience to others, convincing them to join.

Interestingly, once the weak bridging ties that the CCS OM had helped create in the first process, strengthened as a result of face-to-face meetings, the online platforms were found to help maintain them and thus ensure continued benefits for the CCS users which these strong ties provided. For instance, Mary and Mark both used Facebook, especially features like online chat to maintain contact with friends that they had created through face-to-face meetings. The online platforms were considered particularly valuable by these users, as they overcame the problem of distance that would have otherwise prevented the maintenance of these relationships. Mary’s friend lived in Brazil, and without technology to maintain

communication with him, she could not have continued accessing benefits such as support and advice related to her career and area of study which the two shared in common. Mark also acknowledged the role that Facebook played in maintaining both friendships and acquaintances in his Foraging group when all inter-personal communication lines were broken due to the earthquakes in Christchurch.

Technology also plays a role in communicating the benefits and positive experiences of participating in using CCS, which can function as social proof for others. As people experience benefits due to social capital outcomes such as norms, network extension and trust, they can provide feedback about their transactions online which creates what is known as reputational capital according to Botsman & Rogers (2010). This reputational capital is based on an aggregated amount of reputation a person gathers online. It is a source of social proof for those new to Collaborative Consumption to encourage them to try it out and can form the new currency on whose basis future transactions can take place. An example could be the number of positive references a Couchsurfer has gathered and their response rate (how many Couchsurfing requests they reply to) which could serve as a fair indicator for someone to decide whether to conduct transactions with this person or not and serve to encourage them to participate in Couchsurfing.

Amplification of social capital and the virtuous cycle

According to Cho and Baek (2012), CCS can lead to an enrichment of the relations of users. It could lead to a conclusion that repeated usage of CCS would lead to a greater enrichment of these relations. This was a frequently stated reason for users going back to re-using CCS. Users wanted to experience the social capital outcomes that generated benefits such as connectedness and opportunities amongst others, hence causing them to re-using the CSS or in some cases, using other CSS. An interesting finding was the benefits users who participated in multiple CCS differed from others who had participated in only one.

A striking difference was found between Harriet and the benefits she received in comparison the other two carpoolers, Phil and Tim. Harriet, who used CSS such as carpooling, couchsurfing and peer-to-peer renting of objects described the biggest benefit she derived from using CSS was the enjoyment gained from trusting people making her more willing to share different things. This depicted a high level of generalized trust, which was in contrast to the more particularized levels of trust the other two carpoolers had gained.

Mark, who had gotten involved in a number of other CSS as a result of his involvement with Foraging described that the social interactions this participation had '*forced*' him into was extremely beneficial. Mark said that given that he was '*anti-social*' by nature, these social interactions '*pulled him out of his shell whether he liked it or not*' and was very useful that way.

The benefits arising out of social capital thus seemed to be amplified when participation in multiple CSS occurred, causing a virtuous cycle to form as amplified benefits induced a return to using other services or the same service.

An important observation was that strong tie creation was not mandatory for initial participation in CCS to occur. In short, people did not need to know each other before beginning transactions. CCS online means (OM) illustrated this in the first process of *finding and connecting with people* this with their ability to draw strangers together, connect with each other on the basis of weak ties and perform transactions that taken collectively could produce a more efficient method of resource allocation. The problem with this particular method of connection was the requirement of trust between strangers. OM produced trust by providing a network closure effect through making the entire online community a third party that was able to observe the actions of each other. This served as an incentive for acting in a cooperative manner as failure to do so would result in damage to a person's reputation. This restrained opportunism and generated thin trust enabling a person to commit to a face-to-face transaction. Essentially, technology behaved as a *gatekeeper* that enabled one to find a suitable person to conduct transactions with in the CCS.

The next process to occur was the *actual participation in the CCS*. Different social capital outcomes were produced depending on whether the CCS was commercial (with money based transactions) or not. For instance, monetary based ones were unlikely to produce norms of generalized reciprocity due to monetary transactions comprising of specific reciprocity. Norms of generalized reciprocity and norms of generalized trust on the other hand were found to necessary for a non-monetary based model to function effectively

and efficiently. These norms reduced the need for surveillance and monitoring, ensuring cooperative behavior which resulted in the benefit of easier and efficient transactions.

Other benefits as a consequence of social capital generation were informational benefits and opportunities from network extension and increased levels of connectedness which was linked to personal well-being and increased social cohesion. CCS OM and other technology such as Facebook played a role in *maintaining ones' networks and relationships* from which benefits such as support and advice continued flowing. These benefits induced users to return to re-using the CSS or other CCS. A by-product of this process was by taking these positive experiences and benefits to the CCSOM, reputation capital was produced, which functioned as a form of social proof for others present in the online network and convinced them to participate in this CSS. As benefits were experienced from using one CSS, some users, while continuing re-using the existing service also started using other CSS which served to amplify their level of social capital outcomes and associated benefits. This is represented by the arrow going from benefits to the first process of the model and represents the virtuous cyclical nature of the model.

Conclusion

Essentially CCS were found to have the ability to bring people together and produce social benefits arising from both bonding and bridging social capital. At the same time the transactions these individuals were engaged in collectively produced a more efficient resource allocation outcome. This has important implications for local government and similar bodies concerned with community development.

Several things need to be considered in designing CCS. An important component is designing for the purpose. Is the purpose to create a way of increasing social capital outcomes? Or is it purely as a way of enabling allocation of resources to save on costs? This will determine the features the system will need to have.

Another aspect of design is who is this system being designed for? Is it for a community with fairly close ties? In that situation perhaps an elaborately designed online reputation system might be redundant as the community share strong ties with each other presenting a network closure setting which can generate incentives to behave in a cooperative manner. If it is for a relatively new neighborhood, then an online platform with additional communication features such as chat rooms, private chats, and online community noticeboards could be a way to maintain weak or strong ties that were built through physical interactions online.

Another aspect is to design to increase adoption. A way this can be done is to design them in a way to decrease levels of effort required to participate in them. An example mentioned by an interviewee was a mobile fruit foraging app that updated listings according to seasonal availability and automatically provided direction to this.

The findings have very positive implications for cities and thus for local governments. According to Putnam (2000), both bonding and bridging types of social capital are important for sustaining healthy communities. Essentially CCS, were found to have the ability to bring people together and produce social benefits arising from both bonding and bridging social capital. At the same time, the transactions these individuals were engaged in collectively produced a more efficient resource allocation outcome. This is useful for cities in two main ways: the first way being concerns about lack of social cohesion in cities, particularly amongst disadvantaged people living in poorer communities, while the second being a more sustainable use of resources.

Social cohesion has been a major concern in cities as the importance of having healthy communities supporting innovation and resilience have been recognized (Wellington City Council, 2013). Some policies that have been suggested for developing social capital and social cohesion are to have people participate in social and community activities, to co-operate with one another through the formation of informal groups and through encouraging trust (Forrest & Kearns, 2001) CCS has the potential to facilitate the development of all these policies. For instance, it was found that all users developed trust as a result of co-operating with each other as part of a CCS transaction. Another goal that was identified by Wellington 2040 was to build sustainable resilient communities to handle resource challenges such as declining oil reserves, increasing population and food shortages (Wellington City Council, 2013). CCS

such as food foraging present an efficient method of resource consumption, with redistributing publicly or privately grown fruits, herbs and vegetables that would otherwise go to waste to those who are in need of them. CCS has the potential to meet both these goals.

City councils should consider funding the development and maintenance of these CSS given the benefits they can provide in the form of social cohesion and a more sustainable consumption of resources. Another interesting implication arises from one of the findings relating to the amplification of social capital outcomes and benefits generated from involvement in multiple CSS. City Councils are being challenged to find new and engaging ways to deliver services to citizens (Wellington City Council, 2013) and this particular finding can be a way of addressing this challenge. City councils can look into aggregated service delivery which provides greater convenience for citizens as they access multiple services through one interface.

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