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Reprint of: Social movements and free innovation

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ABSTRACT

In this article, I explore innovation and diffusion from social movements as part of the phenomenon of free innovation in households. The article contributes to the literature on household innovation by illustrating how social movement motivations may differ from motivations examined in prior studies focused on self-rewards, as well as examining the implications for free innovations and diffusion patterns in this setting. Social movement innovators are typically motivated by a common cause (such as a quest for a new life order and societal change) and create innovations that address a cause and “system change” rather than individual goals. I identify and define three types of social movement innovation: behavioral, product, and symbolic innovation. The common-cause motivation also creates a new form of diffusion problem that can only be solved through the spread and consumption of new products, behaviors, or techniques by a sufficiently large crowd. Common-cause motivations should thus encourage innovation diffusion, thereby reducing the risk of the diffusion-failure problem usually observed in household innovation research.

1. Introduction

A recent surge of research has documented the large and expanding role of free innovation by household-based individuals, consumers, and user communities who engage in innovation on their own time (Baldwin and von Hippel, 2011; Franke and Shah, 2003; von Hippel, 2005; von Hippel and von Krogh, 2003). The extant research presents a distributed innovation process in which unpaid innovators are self-rewarded for their efforts and give away their innovations for free (von Hippel, 2017). This self-rewarded form of motivation, however, offers only weak incentives for innovators to invest in diffusion, which results in a significant problem with innovation diffusion (de Jong et al., 2015; Pongtanalert and Ogawa, 2015; von Hippel, 2017; von Hippel et al., 2012).

While existing research explains the lion's share of innovation activities undertaken by free innovators in households, a broader view reveals that social movements—a large and important phenomenon and source of innovation—are captured by the definition of free innovation (see von Hippel, 2017, p. 2) but do not seem to conform to the existing characterization of self-rewarded motivations in free innovation. In social movements, the role of the individual innovators who participate is

to change “the system,” and their motivation is a common cause, both of which thus differ fundamentally from the roles and motivations described in the household sector (HHS)—innovation literature. Insights into such movements can add new and useful information to the literature on free innovation by household-based people regarding the nature of innovations they spur and the level of innovation diffusion they inspire.

The new perspective on HHS innovation outlined in this paper is rooted in decades of sociological studies of social movements (Blumer, 1995; McAdam, 1983; McCarthy and Zald, 1977; Meyer and Staggenborg, 1996; Rao et al., 2003, 2009; Tarrow, 1998; Tilly, 1995, 2006; Meyer and Staggenborg, 1996). Such studies usually explore broader societal change, consumption, politics, and behavior related to movements such as the Hong Kong protests, climate change activism, and counter-movement activity.¹ Many of these movements have millions of participants and spark significant innovation activity. An important aspect for our interest is that the core motivations of participants in social movements have been defined as “collective enterprises that aim to establish a new order of life” (Blumer, 1995, p. 60) through “effort by a large number of people to solve collectively a problem that they feel they have in common” (Toch, 1965, p. 5).

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¹ For instance, civil rights vs. fascism-oriented movements or environmentalist vs. anti-environmentalist movements.

A social movement innovation can thus be defined as a novel combination designed to support the common cause of the movement and to enable the establishment of a new life order. As such, the innovations of social movements and their participants are not primarily driven by individual-level motivations (e.g., personal need or hedonistic motives) or other forms of self-reward or, indeed, collective motivations that benefit a certain in-group. Rather, innovation is part of a larger desire to change the system by innovating and collectively changing behaviors: for example, by saving the climate, not killing animals, or developing an economy less focused on consumption and growth. The collective nature of such movements means that individuals collectively agree to solve a societal problem for which they require certain new solutions and practices that will enable the desired new behaviors.

In addition to the actual development of new solutions that promote the movement's cause (e.g., a tangible artifact or product, practice, or behavior, such as a new recipe or technique), establishing a new order requires a critical mass of adopters. A social movement can only establish a new order of life (e.g., societal change) if everyone—or at least a sufficiently large crowd—adopts and uses the innovation, behaves in a certain manner, or consumes the new product in the desired way.

This common-cause motivation and the shared incentives to reach critical mass are clearly related to innovation diffusion, since an innovation fulfills its purpose only if it is diffused widely. Thus, rather than a diffusion failure problem, as identified in the extant HHS innovation research (de Jong et al., 2015; von Hippel et al., 2012), we expect the social movement context to spark abundant innovation diffusion. But social movement innovation leads to a novel set of challenges based on innovation and diffusion related to what is involved in meeting a potentially high bar of creating innovations that can actually assist in changing the system, and how large-scale diffusion may be achieved.

Thus far, innovation in social movements has not received attention from innovation scholars or, particularly, scholars of household innovation. The topic invites a few central questions:

- 1 What types of innovation can be expected from free innovators in social movements?
- 2 How do participants' common-cause motives shape innovations and diffusion in this setting?
- 3 How does this situation resonate with our established understanding of household sector innovation?

One may expect social movement innovation to be primarily a special form of HHS innovation, since it consists of citizens who innovate in their spare time. But in terms of the motives, goals, and purpose of the innovation, social movements differ from the current understanding of HHS innovation, with potentially important consequences.

The present study is conceptual and explores the phenomenon of innovations in social movements based on purposive samples. It contributes to HHS free innovation studies by pointing to innovation with the purpose of changing an overall system more than addressing individual and in-group needs. Social movement innovators do so to change the system, which has implications for the types of innovations we can expect to arise. Wanting to change the system results in motivation taking center stage—i.e., having a common cause—which relates to changing the system, not individual or in-group benefits. This scenario has implications for diffusion that can add insights to free innovation in

the HHS literature.

In the following, I first discuss the motivations and goals of typical free innovators in the current HHS innovation literature – single user innovators –, as well as open collaborative innovators,² and compare them with social movement innovators. Second, I discuss typical innovation outputs in social movements, namely behaviors (protests and tactics) and products and services designed to further the cause and change the system; and in some cases, innovations come to serve as symbols for the movement's cause. Third, I discuss innovation diffusion in social movements and provide comparisons to insights from the context of free innovation in HHS innovations.

2. Motivations to create social movement innovations

Social movements aim to revolutionize society and change “the system” by collectively attempting to change citizens' behaviors and practices. Their common cause becomes the overarching motivation for innovation and related activities. Thus, individual innovators in a social movement innovate in order to solve problems related to the specific common cause. This phenomenon differs from “traditional” HHS innovation, in which innovations are driven by self-rewarded motivations, such as personal need or hedonistic motives, as defined by von Hippel (2017, p. 2). Von Hippel (1988, 2017) has described both single user innovators and open collaborative innovators as being motivated by individual user needs.

As HHS innovators, social movement innovators typically use their own local information as a starting point for their innovation creation in terms of form and function. The main difference between the two is that social movement innovation is motivated by and directed toward the common cause of the movement. In contrast to the current view on HHS innovation, social movement innovation does not require an individual need to be conceived or the fulfillment of that need to be successful. Rather, such innovation can be motivated exclusively by the common cause, for example by benefitting a system or society via products that support clean air, fresh water, and safety. In this way, social movements may serve as a useful complement to our understanding of HHS innovation in generating innovations rooted in the common cause rather than individual and group needs. Social movements thus may also result in innovations that differ from those studied in HHS innovation research.

To more fully appreciate the distinctions between (1) single user innovators, (2) open collaborative innovators, such as those studied in the HHS innovation literature (the closest is von Hippel et al., 2005), and (3) social movement innovator motivations, we can perhaps best draw on Schwartz's theory of human values (1992, 1994, 2015). These values are “desirable trans-situational goals, varying in importance, that serve as guiding principles in the life of a person or other social entity” (Schwartz, 1994, p. 21) and can provide an important theoretical basis for social movement innovator motivations. Schwartz (1992, 2015) maps human values on dimensions, one being contrasting ‘self-transcendence’ and ‘self-enhancement’ values. This dimension reflects the conflict between advancing the welfare and interests of others and nature, such as in social movements driven by common cause, and personal interests such as in the single user innovation cases, or mixed between the two extremes the open collaborative innovator models where personal interest and potentially the welfare of the in-group (such as in user communities) is in focus.

² A single user innovator may be defined as “an individual in the household sector ... who creates an innovation using unpaid and discretionary time and does not protect his or her design from adoption by free riders”; with open collaborative innovators, “a collaborative free innovation project involves free unpaid household contributors who share the work of generating a design for an innovation and do not protect their innovations from adoption by free riders” (both quotes from von Hippel, 2017, p. 38).

Schwartz's theory identifies human values and the motivational distinctions between them. The theory allows for characterizing and distinguishing various archetypes of free innovators vis-à-vis innovation and diffusion. Self-enhancement value is driven by a motivation for power and achievement, while self-transcendence value is derived when individuals do not focus on their own personal needs and desires to act in the interest of others or the natural world. The latter value is composed of two prosocial values: benevolence and universalism. The focus of benevolence is on the welfare of close others, the in-group, and the preservation of the welfare of people one is in contact with. In contrast, universalism is linked to a concern for the welfare of all humankind or the natural world.

Interestingly, self-rewarded single user innovators might create innovations to solve their own problems. This is self-enhancement. For instance, achieving a prominent position in a sport may lead someone to innovate his or her equipment or to develop a new technique (see, e.g., [Hienerth's, 2016](#) examples). This same underlying motive may be at work among open collaborative innovators ([Franke and Shah, 2003](#); ([Hienerth et al., 2014b](#)), with the added benevolence value that relates to certain situations of the user community context, in which people have regard for the community group. In open user community innovation observing innovation and diffusion related to transcendence values may be possible, in particular benevolence, where innovation and sharing are based on care for the in-group, such as in open-source software developers sharing with other open-source software developers and users, or a patient innovator suffering from a rare disease who develops and shares new solutions for the care of others who suffer from the same disease ([Habicht et al., 2013](#); [Oliveira et al., 2015](#)). But the social movement innovator archetype will innovate and diffuse creations motivated by the underlying self-transcendence value of universalism, with the motivation of wanting to change the system and caring for all humankind or the natural world. Innovations and diffusion to promote environmental and political/democratic causes are applied examples of universalism.

In the following I will focus on how the common cause (a self-transcendence value of universalism), in addition to being a fundamental motivation, may also be related to the product of certain types of innovations, directed at affecting the external world, regardless of the recipient. I also examine how such a motivation may be related to a relatively high innovation diffusion compared to what may be observed among single user innovators and open collaborator innovators.

3. Behavioral, product, and symbolic innovations

Given the broad mission of social movements, social movement-based innovations are conceptually different from HHS innovations, in that they tend to start from a broader common cause than individual-level motivations. Because the cause is the driving force, we should expect certain types of innovation outputs. Below, I identify key types of social movement innovations, which may span a broad range, including (1) behavioral innovations, such as protest innovations and tactics to raise awareness of the cause; (2) tangible innovations that serve the common cause; and (3) symbolic innovations that come to represent the movement.

3.1. Behavioral innovation in social movements

Researchers have a growing recognition that HHS innovation is concerned with more than those tangible innovations that have received the most attention in prior research ([von Hippel and Cann, 2020](#)), such as the recently studied service and technique innovations ([Oliveira and von Hippel, 2011](#); [Hienerth, 2016](#); [Hienerth et al., 2014a](#)). [von Hippel and Cann \(2020, p.1\)](#) define behavioral innovation "as consisting of one or a connected sequence of intangible problem-solving activities that provide a functionally novel benefit to its user developer relative to previous practice." Interestingly, researchers on social movements have

extensively explored behavioral innovation and change processes in social movements over the past decade of research. Their studies focus on the protest and tactic types of behavioral innovation ([Tilly, 1995, 2004](#); [McAdam, 1983](#); [McCarthy and Zald, 1977](#)) and explore the origins of innovations in protest actions and tactics and their effects on movements' change processes ([McAdam, 1983](#); [Wang and Soule, 2016](#)). [McAdam \(1983\)](#) found a strong relationship between the introduction of such innovations and surges in movement activity, although the effects of tactics were noted to decrease as opponents learned about them, thus creating a need for continuous innovation. Such innovations are often used to increase a cause's salience when a movement's participants sense overall resistance or ignorance from "the system." [Wang and Soule \(2016\)](#) found that the most novel of these constant protest innovations originated from people at the fringes of movements, a finding that seems to strike a chord with those from HHS-related innovation studies of crowds and communities ([Dahlander and Frederiksen, 2012](#); [Jeppesen and Lakhani, 2010](#)).

Where the two perspectives differ is again in the existence of a common-cause motivation, with people using protest and tactics to reach the overall goal of the movement and not individual goals that benefit the developer. In social movements, a behavioral innovation can thus be defined as a novel behavior (or a novel combination of behaviors) designed to support the common cause of the movement.

Behavioral innovations such as protests and tactics in social movements are deployed publicly, which means they are diffused by default in demonstrations and acts of civil disobedience, such as by blocking traffic and performing street theater. For instance, during the recent Hong Kong protests, "Be water," a famous quote by Bruce Lee, served as inspiration to protesters to adopt an innovative, amorphous protest approach in their tactical maneuvering. Protesters moved quickly from one neighborhood to another, backed by alerts on the messaging app Telegram and a website protesters used to identify the locations of police or other protest groups in need, which made it difficult for the police to follow and arrest them. In the same context, protestors employed umbrellas to passively resist the police's use of pepper spray to disperse the crowd during an occupation in Hong Kong.

In the veganism movement, participants in the animal rights segment have innovated in their protesting by using the so-called Cube of Truth, in which a "cube team" of people clad in black with Guy Fawkes-style white masks (made famous by the Anonymous movement) hold signs and present video footage demonstrating what animals used for food endure every day. Taking this approach further, the group Biteback.org uses virtual reality to show participants at events and meetings what being a pig in the pork industry is like. Interestingly, this type of protest innovation has not garnered much attention in the HHS innovation literature, with one exception, which shows the approach's application in the challenges of managing co-creation and crowdsourcing contests where participants who perceive their treatment to be unfair find new, creative ways to protest and unite in opposition against the organizer ([Gebauer et al., 2013](#)).

Research on social movements is rich in insights on behavioral innovation that can enrich our understanding of the HHS innovation phenomenon vis-à-vis behavioral innovation. Both HHS researchers and social movement researchers have found that innovations come from the fringes of their respective fields ([Jeppesen and Lakhani, 2010](#); [Wang and Soule, 2016](#)). [Wang and Soule \(2016\)](#), for example, found that most innovative behaviors came from the fringes of the movement; if not for the promotional aspect and public deployment, such behaviors would remain "hidden." For instance, the active public deployment and inherent promotional aspect of many behavioral innovations in social movements offer a perspective into ongoing efforts to understand behavioral innovations in HHS by examining the effective diffusion of otherwise hidden behavioral innovations in HHS that may take place, given that the innovators are inclined to diffuse.

3.2. Product innovations

In social movements, product innovation may be defined as new combinations in the form of products or artifacts that support the movement's common cause. Such innovations are tangible artifacts that may start from an individual participant's local information or experience, which is often required to conceive an innovation. Satisfying an individual need, however, is an insufficient condition for a social movement innovation. A central condition of product innovation in a social movement is that it must contain features that are widely perceived to be positively associated with the common cause and changing the system.

A case may be found in the emergence of Danish wind turbines initiated in the 1880s by the scientist Paul La Cour, who was a participant in the collective "folk high school" movement in Denmark and was driven by a desire to bring electricity to people in the Danish countryside. Interest and innovation in wind power regained traction in the 1970s as a collective invention aimed at a common cause, when, in addition to being a sustainable source of energy, wind power also became a viable alternative to nuclear energy, which was contentious and fought against by energy-related social movements such as OVE (the Danish Organisation for Renewable Energy, from the Danish "Organisationen for Vedvarende Energi") and OOA (the Organisation for Information on Nuclear Power, from the Danish "Organisationen til Oplysning om Atomkraft") (Karnøe and Buchhorn, 2008). One of the first large-scale turbines was conceived and built in Tvind, a "camp" related to the social movement interested in proving the realizability and usefulness of alternative energy in the countryside (;).

In the recycling field, the US recycling movement launched closed-loop systems around the country in the 1960–70 s. Many initiatives since then have come into being as the growth of plastic pollution has become increasingly evident, such as trash collection and plastic waste. One example is "Mr. Trash Wheel" (officially the Inner Harbor Water Wheel), a garbage-collecting device invented by museum director and inventor John Kellett that scoops up waste from a tributary leading to Baltimore Harbor.

3.3. Innovations as symbols and symbols as innovations

Prominent social movement innovations can perform more than their functions as innovation: they serve as innovations and they also take on a role as symbols that appeal to the movement's common cause and collective identity.

Transformations of existing innovations into symbols reassign the social meaning of the innovation, thereby generating a secondary diffusion of the innovation in the public in the form of a symbol for the movement (Zald, 1996; McAdam et al., 1996). This role thus depends on an innovation's symbolism rather than its functional qualities. Innovations whose innovativeness is derived from their symbolic meaning need not necessarily be newly entered into a social system to constitute symbols (Hirschman, 1982). The innovations' roles emerge from the point at which their meanings are redefined, which allows these innovations to take on novel attributes. Such symbolic innovations have utility not only because of their technological or behavioral qualities but also for how they become social devices for communicating and creating identities among existing and potential participants in a cause (Hirschman, 1982; Taylor and Whittier, 1992).

In social movements, Hong Kong's Umbrella Movement provides an example of an innovation with a dual function: in addition to the behavioral innovation of using umbrellas to shield people against tear gas, the umbrellas took on symbolic meaning for the movement. In so doing, they drew attention to the cause and led to collective identification, thus fostering mobilization. In this role, innovation may both strengthen the identity of existing movement participants and mobilize new members, who pursue the critical mass required for the change they seek. In social movements, a symbolic innovation may be defined as an

existing innovation that is repurposed to serve as a symbol that supports the common cause of the movement. The Mr. Trash Wheel innovation mentioned above also became a symbolic innovation, with T-shirts printed with Trash Wheels and local beers named in their honor.

Finally, a distinct way that symbolic innovation in social movements can emerge is through the sheer invention of a new symbol that effectively represents the cause and provides identification with it from existing and would-be participants. An example is the Gilet Jaune or Yellow Vests Movement for socio-economic change in France, which uses the symbol of the fluorescent vests mandatory for emergency use in French cars to create an effective symbolic innovation that could easily be adopted to show support for the cause. The latter may be likened to innovative symbol creation, which has been observed in earlier research on user communities with links to collective brand identification (see Muniz and O'Guinn, 2001; Füller and von Hippel, 2008). In these cases, community members ascribe substantial value to such symbols and their value in creating identification with the community.

In the case of HHS's collaborative communities such symbols also create value for community participants by delineating the in-group through uniqueness and exclusivity. Whereas in user communities, symbols assign exclusivity and membership; in the social movement innovator context, in contrast, people seek the opposite of uniqueness. In this case, the creation of value for a set group is not the purpose; the purpose of the symbol is to point to the cause, and the desired result is the broadest possible adoption. The notion of symbolic innovation in social movements can expand the view within HHS's innovation repertoire by highlighting those situations in which, for instance, a user community that seeks a similar goal can rely on a symbol to rally and mobilize.

3.4. Social movement innovators and changing the system

Free innovators in social movements, much like HHS innovators, are triggered by needs. In the case of social movement innovators, however, the need to be addressed occurs at the system level. Innovation is initiated by individuals who question the main assumptions of the existing regime (Elzen et al., 2004) and contest the established system, which does not offer a solution. The social movement participants engage in innovation to change the system when they become sufficiently dissatisfied with the established system. In seeking large-scale system change, members of the social movement take on the established "system owner," which might be the government (e.g., as a planner of transport) or an industry (e.g., movements such as animal rights that take on the farming industry over animal husbandry practices) (Elzen et al., 2011). Social movements become active because the system owner is not aware, able, or willing to come up with the change desired by social movement participants, such as in the case of US recycling activism in the 1960–70 s, when methods for sustainable recycling were not supported by the solid waste industry (Lounsbury et al., 2003). Therefore, in contrast to HHS's single user innovators and open collaborative innovators (which seek to innovate for one's own, group, or community needs), social movement activists must innovate entire systems. Doing so may involve a range of different domains, including technology, products, techniques, behaviors, images, symbols, meanings, and communication campaigns. To be successful, this all has to be created, diffused, and adopted before it can eventually replace the set of outdated elements that make up the old system. In partially successful cases, innovation will raise sufficient awareness to induce a change among the system owners.

Researchers on system innovation and change focus on the structural problems that modern societies may face, such as the energy or transport industries, which suffer problems including oil dependency and CO₂ and NO_x particle emissions. Such researchers argue that problems of this kind cannot be effectively solved with incremental efficiency gains but instead require systemic change (Gebauer et al., 2013; Geels, 2002; Elzen et al., 2004); they often explain the process of change as growing

the nodes between new solutions and actors, and institutions (see also Bijker & Law, 1994; Latour, 1986; Callon, 1986). When successful, system innovations come about as the cumulative changes align and innovations from various niches combine into a larger whole where sufficient linkages between the nodes of social and technical entities have merged into the new system. In the case of social movements, innovators are involved in populating these niches.

Social movement product innovations may improve the technology and add to the technological possibilities in the new system (Lounsbury et al., 2003). Behavioral innovations may do the same in case they are new techniques, but they also serve to raise awareness of the cause and the change if they are publicly deployed actions intended to draw attention to the cause (McAdam, 1983). Both behavioral social movement innovations that aim to draw attention to the cause and symbolic innovations serve to raise awareness in the social system and, in so doing, fuel the system change.

3.5. Barriers to the creation of social movement innovations

Barriers to the creation of social movement innovations also exist. While social movement innovations, as argued above, are important and frequent, the world is not overflowing with social movement innovations. The bottlenecks are likely to be found in the nature of the social movement innovations themselves. For the creation of social movement innovators, the nature of innovations of social movements is heightened and bounded (compared to innovations for personal needs) by such innovations' criteria of having system-changing properties. Such innovations may need to meet a higher bar in terms of their qualities and applicability, given that they have to fit the movement's cause. In other words, addressing a larger cause may be more difficult than addressing any personal need (or merely innovating for oneself or an already-known group) without the added requirement of having common cause-resolving qualities. By definition, social movement innovations should also be able to meet the additional requirement for broad-based adoption. Because the bar is higher, fewer social movement innovations may be created in the first place (Table 1).

4. Social movements and the diffusion of innovation

HHS innovation researchers have emphasized that the diffusion of innovations is far from a given (Harhoff et al., 2003). Self-rewards drive innovation, but only provide free innovators with weak incentives to make themselves aware of the needs of others or to invest in the preparation and sharing of the innovation (de Jong, 2015; de Jong et al., 2018; Ogawa and Pongtanalert, 2013; von Hippel, 2017). From this perspective, HHS innovators achieve their goals when a solution becomes applicable and solves the creator's own problem; diffusion thus requires additional incentives (von Hippel, 2017). Interestingly, findings from surveys of free innovators in HHS (De Jong, 2015) show high willingness - 4 out of 5 are willing to have other users or commercializing firms adopt their innovations - but low awareness and no incentives for diffusion. The studies show that only a small share of these innovations is shared. The diffusion problem is most pronounced in the case of single user innovators, where potential adopters are not immediately present. Interestingly, however, for free innovators in the open collaborative context of HHS, researchers have found the diffusion problem to be less severe when free innovators belong to collectives such as user communities (de Jong et al., 2015; Ogawa and Pongtanalert, 2013; Chen et al., 2020; Kim, 2015). This situation suggests that in this context, as awareness of others' needs increases, so might diffusion; the scenario also aligns with the idea of the realization that others face similar needs, as suggested in the case of Schwartz's self-transcendence/benevolence category. As free innovators' contexts and realities become more connected, the amount of diffusion based on their regard for others' needs may increase. Studies have also shown that the likelihood of sharing also increases in cases where innovators felt a sense of "warm glow" altruism

Table 1

Archetypes of Free innovators along relevant dimensions including social movement innovators.

	Single user innovator	Open collaborative innovator	Social movement innovator
Locus of innovation	Individual	Peer-to-peer development	Individual or Peer-to-peer development
Goals	Solve individual problems	Address individual and collective problems or challenges for the in-group	Solve common problem for group and beyond
Primary Motive	Self-rewards: personal need	Self-rewards: hedonistic	Common Cause
Human Value (Underlying psychological construct)	Self-enhancement	Self-enhancement & Self-transcendence (benevolence) (care for in-group)	Self-transcendence (mostly universalism) (care for humanity and natural world)
Innovation objects/ types	Products (Scientific instruments) Behaviors (Banking services, Wash hands)	Products (computer games modifications) Behaviors (whitewater kayaking techniques)	Products Behaviors (use of umbrella in Hong Kong Umbrella movement protest and tactics) Symbolic artifacts (Umbrella in Umbrella movement)
Resources & Capabilities	Own time and local knowledge	Own time and knowledge Time and knowledge of the collective	Own time and knowledge Time and knowledge of the collective
Diffusion Intention	Low: cost of diffusion vs. benefit of self-reward, low investment, perceived low value	Medium: Collective context allows for altruistic warm glow from sharing; reciprocity and sharing norms	High: Common cause motives predict the majority of innovation to be shared
Diffusion (actual)	Low	Medium: altruism (warm glow). Collaboration mechanically leads to diffusion.	High: limited only by ability and resources to transmit Additional second order diffusion. "Sharing on" by early adopters. Limited by mobilization potential, cost of adoption.
Diffusion via producers	Willingness high; incentive weak Relevant Type of Innovation: Product & service, symbolic	Willingness high; incentive medium Relevant Type of Innovation: Product & service, symbolic	Willingness: high; incentive strong (increased adoption is encouraged irrespective of the diffusion channel). Relevant Type of Innovation: Product & service, symbolic
Entrepreneurship Motive	Weak	Weak	Strong

(von Hippel, 2017).

Meanwhile, in social movements, where it is rational for participants to aim for critical mass in the movement, innovations clearly do not fulfill their mission until they are diffused. One may even argue that the diffusion problem is the opposite as what we see in the two models of free innovation in households—single user innovators and open collaborative innovators—because not diffusing an innovation made by a social movement innovator would defy the purpose of the innovation. It is not sufficient for an individual to invent a solution or solve a problem; rather, such innovations only achieve their full value if they are used by a critical mass of people to establish a new order.

Thus, given the common-cause motivation, social movement innovators are incentivized to be aware of the value of their innovation for other participants (and therefore the common cause) and elaborate on their designs and publicize their innovation to facilitate wider adoption. The overall common-cause motivation should thus result in an active intention to share possible innovations—something that is backed by social movements researchers, who have long examined diffusion and mobilization as integral parts of the functioning of a movement (Givan et al., 2010; Strang and Soule, 1998). More specifically, a few studies have examined the origins and diffusion of innovative protest tactics within or across movements through networks (McAdam, 1983; Soule, 1997; Wang and Soule, 2016).

Though the incentives and diffusion intention should be high, numerous factors may affect the likelihood that an innovation will be diffused, including (1) the match between transmitters and adopters in terms of identity; (2) how transferable the innovation is; (3) the attention the innovation receives from external sources such as the media, where symbolic innovations may gain more attention; (4) whether the innovation has proven successful; (5) whether the innovation is creative or “catchy”; and (6) the existence of brokers in case the innovation is difficult to transmit (Walsh-Russo, 2014; McAdam and Rucht, 1993; Tarrow, 1993; Soule & Roggeband, 2018; Strang and Soule, 1998; Meyer and Strang, 1993). Diffusion may also vary across different innovation types, with those deployed publicly (e.g., behavioral innovations such as protests, or symbolic innovations that are public by nature) tending to diffuse by default.

In addition to diffusion by innovators, social movement researchers also point to what we might call a “second-order diffusion” process (Wang and Soule, 2016), which moves from early adopters to later adopters. In this process, participants who adopt a social movement innovation are likely to actively share the innovation with others. Given their motivations they may seek to promote the innovation to other participants and the public, create awareness and encourage imitation, achieve critical mass and further the cause. This potential virality of innovations has not received much attention among HHS innovation scholars, since their focus has been on overcoming the diffusion problem at the origin in the first place, rather than on mobilization and wider adoption. If adopters subscribe to the common cause, then significant potential should exist for wider diffusion, given the low cost of sharing an innovation further—in other words, helping it go viral. This type of subsequent and additional diffusion has been widely covered in the social movement literature, which discusses both intra- and inter-movement sharing and copying of innovative approaches to protest strategies, campaigning, and tactics (McAdam et al., 1996).

As in the case of the context with single user innovators and open collaborative innovators (von Hippel, 2017; Gambardella et al., 2017), producers may also play an important role in the diffusion of social movement innovators’ creations. Whereas single users innovators often have a high willingness but weak incentives to seek producer collaboration, earlier studies have shown that open collaborative innovators often contribute and collaborate with firms incentivized by recognition and other motivations related to furthering the benefits for the community through firm interaction (Jeppesen and Frederiksen, 2006; Hienerth et al. 2014b) suggesting some incentive to diffuse to, and collaborate with, producers.

Social movement innovators should have strong interest in producers adopting their innovations and further diffusing them through commercial channels, provided that their impact through commercialization will serve the common cause. Numerous examples exist of companies and entrepreneurs being involved in the adoption and follow-on commercial diffusion of innovations (see for instance Rao et al., 2009). Many social movement innovators may in fact require collaboration from organizations in order to produce and supply the alternative technologies and products that will allow them to fully realize their innovations. The links that arise—which often lead to ongoing collaborations between social movement innovators and producers within or alongside much broader social movements—may result in alliances between movements and private-sector firms (Hess, 2005). In some cases, similarly to HHS user entrepreneurship (Shah and Tripsas, 2007), social movement innovator participants become entrepreneurs and create social enterprises that use commercialization as a “mobilizing technology” for social movements (Lee et al., 2018). Entrepreneurship is often spun out of the collaborations, such as in the example of wind turbine innovation in the Danish countryside, where small entrepreneurs began to build and market wind turbines to environmentally oriented consumers (Kirkegaard et al., 2021). Such entrepreneurship will often result in the diffusion of social movement innovations. In many cases commercializing might be necessary to reach the full potential and impact. For instance, many social movement service innovations (such as platform apps that reduce food waste) may be costly to operate and cannot be sustained by an individual innovator in amateur mode.

Whereas producers are an important vehicle for diffusion, only under certain conditions will producers see the benefit in taking on the diffusion cost. This situation will require that they cherry-pick innovations that will be valuable to potential consumers, which means that they will diffuse only social movement innovations with commercial value. We will likely observe a division of diffusion in this case, with social movement members diffusing any type of social movement innovation that is expected to affect the cause positively, whereas producers will adopt only the most commercially promising innovations from this pool. The producers may find that product innovations are best suited for commercial purposes, whereas appropriating returns from behavioral and symbolic social movement innovations may be more challenging.

From the discussion above, we may derive the following propositions about the relationship between innovation and diffusion in social movements:

- Proposition 1: In social movements, the diffusion of innovation is positively related to common-cause motivations and is therefore generally high.
- Proposition 2: In social movements, the high level of diffusion of innovation is further increased through follow-on diffusion by adopters.
- Proposition 3: In social movements, the main bottleneck for diffusion of innovation is the nature of the innovation and the means of diffusion.

5. Hybrid innovation models (single user, open collaborative, and social movement innovation)

We will often be able to identify hybrid innovation models of SMI. These are instances in which innovators have a heterogeneous set of motives of single user innovators or open collaborative innovators combined with social movement innovators. An example, this time a “single user innovator–social movement innovator,” can be found among innovators who have joined the exponentially growing social movement of veganism. Such innovators are motivated both by improving animal welfare and avoiding the impact of modern agricultural production on nature and the climate (Poore and Nemecek, 2018) and by individual needs, such as personal health or taste preferences. As mentioned earlier, an individual need will be insufficient to explain

social movement innovation; only in combination with common-cause motivations can such innovation take on the latter movement's features.

An example of a tangible social movement innovation is the invention of novel vegan pastry products and techniques to solve practical challenges related to vegan cooking and dietary needs. For example, the problem of substituting eggs used for pastry-making and other endeavors was solved by the invention and application of aquafaba (chickpea cooking water). The solution was discovered and used in egg-free meringue by Joël Roessel, a professional tenor singer from Paris who found the substitute through experimentation driven by a personal need, and possibly most strongly by the common cause of veganism. In discussing his endeavor, Roessel created an online tutorial; to paraphrase, he stated: becoming vegan is not easy: you have to change food culture, which requires a real effort. Reclaiming pastry happened to me through understanding. In this tutorial, I will explain what I know and how I managed to do without eggs, milk, and butter without giving up their "magic" properties. Like any journey, changing culture is a real mission, and like anyone in the calling, I make it my duty to share my passion for pastry, which was undermined by the removal of dairy products, butter, and eggs.

Though this product innovation was driven by local information and experimentation, it was motivated by the desire to further the common cause of veganism, which allowed Roessel to actively share his invention widely until it was adopted by millions of people.

Another combination is open collaborative innovation and social movement innovation. In this case, innovators may collaboratively develop solutions that they conceive in response to personal needs, but at the same time, they may be sensitive to a potential common cause through which others may benefit. This situation may inspire an innovator to develop a solution with an obvious personal benefit that has simultaneous benefits for a common cause. For instance, innovators in the open-source software movement are driven by a need for certain software functionalities while also being motivated by the ideology of the open-source software community (see [Lakhani and Wolf, 2005](#); [Hars and Ou, 2002](#)).

6. Discussion and further research

This article contributes to research on free innovators in HHS by discussing the potential inclusion of social movements as a source of innovation. Social movement innovation and diffusion patterns have yet to receive attention from innovation scholars, even though the phenomenon is tightly linked to HHS innovation. In this conceptual study I have explored the phenomenon of innovations in social movements based on purposive samples, and I have outlined similarities and differences between the two literature fields and their corresponding phenomena. I have suggested that social movement innovation complements free innovation in HHS, which focuses on the central questions of innovation and diffusion. Social movements deserve attention as important phenomena in innovation studies: they involve millions of participants in the household sector, many of whom are free innovators. The most important difference between the current notion of free innovators and those I have described as "social movement innovators" is the common-cause motivation to establish a new order, rather than the motivation related to an individual need. Being motivated by common cause has a number of implications for innovation outputs.

I have identified product innovation that takes place in social movements in a similar fashion as the context of single user innovation and open collaborative innovation, with the main difference being the underlying motivations. Behavioral innovation, however, which has just recently begun to receive attention in the HHS innovation literature, is widespread in social movements. Such innovation is most often described in the form of protests and tactics in the social movement literature. HHS innovation scholars interested in behavioral innovation have focused on the form of individual need-driven innovation. I have added to this new notion of behavioral innovation by drawing scholars'

attention to behavioral innovations such as protests and tactics, both of which have been studied in the social movement literature for decades. Tactics and protest are publicly displayed and often collective behavioral innovations that focus on the cause and seek to establish a new order of life.

Research on social movements offers insights on behavioral innovation that can enrich the understanding of the HHS innovation phenomenon related to such types of innovation. The social movement literature has described how the tactics and strategies of large groups form the basis of change. Activists have put substantial effort into refining how best to diffuse behavioral innovation. Given the necessary motivations could be established in an open community setting (for example), some of the promotion that occurs in social movements could provide insights into how HHS innovators better launch and lobby for their innovations to become adopted and undergo effective diffusion. [von Hippel and Cann \(2020\)](#) define behavioral innovation "as consisting of one or a connected sequence of intangible problem-solving activities that provide a functionally novel benefit to its user developer relative to previous practice." The definitions could be expanded to include benefits for others and consider the "spread the news" features of social movement behavioral innovators (e.g., [Strang and Soule, 1998](#); [McAdam, 1983](#)).

Symbolic innovation is also widespread in social movement innovation and can serve as symbolic innovations that participants can rally around; they can also use such innovations to mobilize new participants and to draw attention to a cause.

This article opens a number of paths for future research. Scholars should empirically test the prediction that innovations that emerge from social movements have an outsized potential for diffusion. A key outcome of this initial research on social movement innovation as it relates to HHS innovation is that in social movement innovation, incentives for innovation and diffusion are linked; innovations in social movements do not serve their purpose if they are not diffused. The new diffusion problem can only be solved through the spread and consumption of a new product, behavior, or technique through a sufficiently large crowd. Consequently, we should observe abundant diffusion. The diffusion problem observed in current HHS innovation research is the lack of diffusion, whereas in social movement innovation—given the overriding common-cause motivation—the problem is the opposite: there are strong incentives to diffuse. The observation that social movement innovators (beyond the focal innovators) should also have incentives to participate in "follow-on" diffusion, which potentially plays a central role in the wider diffusion process, should be of interest to HHS innovation scholars. So far, they have focused mostly on the first step of the diffusion process, taken by the focal innovators themselves, however future research might investigate further diffusion to study more precisely the impact of HHS innovation. The results could be compared with social movement innovation to understand differences in actual diffusion and impact in these contexts.

Finally, researchers should consider the role that symbolic innovation plays alongside protest/tactical innovation in diffusing an underlying innovation and drawing attention to the cause. As previously mentioned, these innovations appeal to the collective identity and encourage adoption and mobilization through secondary diffusion.

The role that producers may play in diffusion can be important, given that social movement innovators may have a direct incentive to seek this path of diffusion through either entrepreneurship or actively seeking companies that will adopt and collaborate when promoting the overall cause. Research in social movements on the more precise processes involved in this transition of social movement innovation into the commercial realm may inform and inspire future work in HHS.

Hybrids between social movement innovation, single user innovation, and open collaborative innovation are probably frequent. In this paper I have focused on archetypes, but in many cases the various phenomena overlap. There are for instance traces of common-cause motivations in open-source software development, such as the ethos

that information should be free. I have chosen cases in this paper that best illustrate the various archetypes. Future research might find that hybrids are indeed widespread, and that common-cause motivations found in the social movement context are also found in single user and open collaborative contexts, but possibly less pronounced.

Further research could examine how social movement innovators share similarities with the notion of social innovation (Young, 2011) in purpose and outputs and relate to social entrepreneurship (Dacin et al., 2011; Mair et al., 2006). For instance, social innovation enterprises may be the outcome of entrepreneurship from social movement innovation. The concept of social movement innovation, is more specific in focusing on the sources of innovation: namely free innovators and, more specifically in this case, its origin in a social movement, however, clearly related to ongoing work about outcomes such as social entrepreneurship and social enterprises.

Finally, future research may consider the relationship between innovation and the pressures, conflicts, and competition affecting social movements. Social movement's actions may often lead to conflict with the state and authorities (Dickson, 1985), counter-movements, and possibly with related movements (Meyer and Staggenborg, 1996) competing for influence. Civil rights or environmentalist movements, for instance, may clash with authorities and counter-movements, such as fascist or anti-environmentalist groups resulting in competition, conflict and sometimes even bloodshed and crime. The pressures and competition may affect the rate of innovation and diffusion. Future research may study a potential relationship between variations in such pressures and the rate of social movement innovation.

Credit author statement

Lars Bo Jeppesen did all the work.

Declaration of Competing Interest

The author declares no conflict of interest.

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