Introduction

“In a society where virtually everything is accessed, however, what happens to the personal pride, obligation, and commitment that go with ownership? And what of self-sufficiency? Being propertied goes hand in hand with being independent. Property is the means by which we gain a sense of personal autonomy in the world. When we access the means of our existence, we become far more reliant on others. [...] The shift in the structuring of human relationships from ownership to access appears to invite a trade-off of sorts whose outcome is far from certain.”

The above quote is taken from Jeremy Rifkin’s book *The Age of Access* in which he set forth a vision of the future where access, not ownership, is the dominant market offering (Rifkin, 2000). He supports this idea through a discussion of trends in consumption such as the millions of Americans opting to lease their automobiles rather than owning them. In his view, the very idea of ownership will soon seem old-fashioned. Though elements of Rifkin’s vision may be debated, the trend of a shifting ownership landscape is increasingly prevalent. A decade following Rifkin’s publication, a list of areas in which access, not ownership, guides consumer choice was captured in the concept of collaborative consumption (Botsman and Rogers, 2011). Collaborative consumption is centred on the same general premise—people want their needs and wants fulfilled which may not rely on
traditional ownership. This pays tribute to Theodore Levitt’s famous phrase, “people don’t want to buy a quarter-inch drill, they want a quarter-inch hole” (Christensen et al., 2006).

It is not yet clear if companies are equipped to respond to new ownership paradigms in a way that creates or maintains meaningful user experiences. Often, the problem is a shift from a human-centred design approach of offerings to a business model or technology centric approach. With the business model or technology at the fore, consumer ownership can often be disregarded by a company as outdated or irrational. The unfortunate result is a series of failed offerings due, at least in part, to the psychological elements of ownership not being fully understood, appreciated, and accounted for (Kessler, 2015; Tukker, 2013). This is not surprising since psychological ownership is rarely discussed in relation to product design. However, a new generation of offerings will require a more nuanced approach to understanding how ownership provides meaning to daily interactions and how this should be considered in the design process.

The aim of this chapter is to argue the need to establish a human-centred approach to designing ownership. The human centred approach adopted here considers those objects people feel are theirs, i.e. the objects for which a person feels psychological ownership (Pierce et al., 2003). This includes accessed objects that people do not legally own but likely report feelings of ownership (e.g. my rental car, my hotel room, my social media profile). This approach focuses on why and how people feel ownership for things. The relationship that is formed when a person feels ownership for some target object is referred to here as possession. Other approaches not part of the present discussion include ownership as a legal concept (e.g. the rights a person has to an object) and a business model-centric approach (e.g. why ownership is an outdated concept). This fundamentally refocuses design activities from the creation of a product which can be seen as a static, stage-gate type activity to the design of possessions where the focus is on creating the experience a person has with an object from the time of acquisition to the point of dispossession. The result is direction for
the design community to be deliberate about how they address and facilitate ownership—
ownership by design.

The chapter first explores new dimensions in which ownership in design is expanding. Next, the
motives, routes and paths to ownership are presented and understood from a design perspective. A
new frame for design is proposed that takes designers from the creation of products to the design of
possessions which focuses attention on the user’s experience with the object. Finally, four specific
ways that design can contribute to creating the experience of ownership are discussed.

New dimensions for ownership in design

Through the twentieth century, design was largely about selling mass-produced physical goods that
one person, or maybe a small group of people, would use. Any focus on ownership was about
transferring it from the producer to the user at the point of sale. Changes in ownership were often
subtle and, in most cases, could go unnoticed as people evolved with legislation, corporate policy
and social norms. Much of this changed with the transition to the experience economy (Pine and
Gilmore, 1998). The user experience considers much more. It is a holistic look at “all aspects of the
end-user’s interaction with the company, its services, and its products” (Nielsen and Norman, n.d.).
Today we still design physical goods—perhaps more so than ever before—but these are increasingly
coupled with digital technology and service offerings seduced by clever business models (Thackara,
2006). Along the way, we have lost track of something at the core of these interactions:
understanding how we own or take possession of something. Not legal ownership, but psychological
ownership—the experience of owning.

The importance of ownership as an element of user experience emerges when there are notable
modifications in the way we interact with things. In part, this is why ownership has gone
unaddressed in the design community for so long. We are now seeing wide-scale shifts in the
contexts surrounding ownership. There are at least three dimensions in which the importance of
considering ownership is growing in design: 1) ownership is increasingly examined in an immaterial context such as digital products, services, and associated personal data; 2) The life of ownership is recognised as a time-dependent relationship that is subject to change; and 3) ownership increasingly involves multiple users who may or may not know each other, see Figure 1.

Immaterial Ownership

The target object to which an individual develops feelings of ownership is increasingly immaterial. Immaterial objects include digital artifacts but could also include other more abstract objects such as brands, services, organisations, ideas and even problems. Examples of design work in this space include examinations of how and why people form possessive feelings over digital products and how these feelings compare to traditional ownership (Baxter et al., 2016b; Odom et al., 2012, 2013).

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Figure 1 Expanding dimensions of the ownership experience

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The importance of understanding digital possessions was evidenced across international headlines in 2014 when Apple and the band U2 gifted an album to hundreds of millions of users. This was framed
as a positive move by Apple but the company soon met a wave of backlash from many users (Peterson, 2014). User concern stemmed from the perception that Apple infringed on the users’ libraries because the album was placed in users’ libraries without their consent. In other words, the move was seen as an affront on what users felt was theirs. As one writer put it, the move was a reminder that iTunes music belongs to Apple as much as it does to any user, and that “consent and interest are no longer a requisite for owning an album, only a corporate prerogative” (Wade, 2014).

Some digital possessions such as photos and music libraries have replaced material counterparts. Though this gives some frame of reference, behaviours relating to the acquisition, maintenance, curation and disposal of these digital possessions can vary significantly from what may occur in the physical world (Odom et al., 2012). For other digital possessions such as websites there is less in terms of a physical counterpart. Digital possessions are further complicated by shifting policies since, unlike the material world which has evolved over centuries, the exploration of digital possessions is relatively recent.

A broader assessment of immaterial possessions is that they are nearly always, by their nature, dynamic entities that change with time. For digital objects, this may be the result of technology updates. Other immaterial possessions such as organizations, brands, and ideas are inherently prone to change. Designers should seek to gain a deeper understanding of user experiences with immaterial possessions. In so doing, an ongoing task will be to understand how to facilitate meaningful experiences with the possession of brands, services, organizations, ideas, problems, work-related tasks and other immaterial objects.

**Life of ownership**

Ownership increasingly needs to be considered across the entire duration of possession, not just the point of sale. This dimension of the life of ownership is about understanding how an object becomes a possession, how it is possessed, and how it gets dispossessed (Baxter and Childs, 2017). The time
element of this dimension is important partly because the duration of ownership is increasingly
dealing with short timescales such as quickly moving in and out of jobs and accessing, rather than
outright purchasing products. Design can and should seek to play a more active role in facilitating
meaningful experiences throughout the life of ownership.

One notable example where the life of ownership is critical is in sustainability concerns. Ensuring
that product value is reclaimed at the end of its life has led to the development of several initiatives.
For instance, extended producer responsibility gives producers a vested interest in what consumers
do with their products after purchase. This involvement, whatever the extent, may mean that
consumers no longer have ultimate control over the product typically seen of traditional ownership
(Snare, 1972) and the result may be that the way they show ownership at the end of life will differ.
For example, prior work has shown that disposal can turn possessions into assets evaluated for
possible gain (Denegri-Knott and Molesworth, 2009). This may not occur if extended producer
responsibility limits how people can own throughout the product’s life.

Exploring the life of ownership is more broadly about understanding if and how ownership fluctuates
through time and how this leads to relevant outcomes. It may be that through careful design, people
may develop the same level of psychological ownership over products possessed for hours as they
do for those things kept for years. Other times, the critical design question may be how to relinquish
a feeling of ownership so that a person will part with the object at a meaningful time. Understanding
these lifetime questions will help designers better design meaningful offerings.

Ownership with multiple users

Traditional ownership occurs with a single person or small group such as family, friends or co-
workers. This communal ownership amongst a close group is more similar to ownership than it is to
sharing amongst strangers (Belk, 2010). Increasingly, multiple users share ownership of a common
object as seen in the case of an online community (Lee and Suh, 2015). Managing the experience of
those involved in this scenario of ownership is a central concern to the future of ownership research and design.

Sharing schemes represent an example where multiple users are important to consider in ownership. Such schemes have been facilitated at an unprecedented rate through technology that helps govern when and how various users may engage with a product or service. Mixed results have been reported for sharing schemes in part because the value gained from ownership does not appear to be fully appreciated (Kessler, 2015; Tukker, 2013). One issue is that the presence of other users can taint the way someone interacts with the offering (Bardhi and Eckhardt, 2012). A stronger focus on how to create and maintain the value people get from owning is needed to develop successful sharing models.

In many situations where there are multiple users, little or no legal ownership is present since it is often retained by the producer or some third party. Despite this, it is common to see psychological ownership for these offerings. For example, users will describe accessed products in possessive language: my rental car, my online community or my hotel room. Managing the complexities of the relationships between various people and objects should be a central goal of design research in the coming years.

**Foundations of the ownership experience**

The previous section has discussed the expanding contextual dimensions for ownership in design and the subsequent need for new design approaches. In this section, we discuss the foundations of ownership that are necessary to understand in order to help design the experience of ownership. Specifically, this section links psychological ownership theory to design frameworks to offer direction to designing for ownership. The motives, routes, and paths to possession are discussed. Following this, a new frame for design is proposed and several specific ways in which design can help in designing ownership experiences are discussed.
A human-centred view of ownership first considers the possessive feelings people have towards an object. These feelings result from the interactions and experiences one has with an object. Thus, a human-centred design approach to ownership might consider how to create and support such feelings. If we take ownership as a state of the relationship between a person and an object, then ownership is fundamentally about creating a human-object experience. We must acknowledge what design can actually do since experiences cannot be designed, only designed for through affordances (Pucillo and Cascini, 2014). Affordances are the possible interactions enabled by the features of an object and the knowledge and capabilities of the user (Norman, 2013). Thus, an experience is here thought of as a reflection on some set of interactions with a given object. In terms of designing for ownership, the most design can do is create the conditions in which users can take possession of something through affordances (Baxter et al., 2015).

Several models have been proposed in the design community to describe the process a person goes through to interact with the surroundings. These models can be applied to facilitating feelings of ownership (Baxter et al., 2015). The model proposed by Hassenzahl (2010) can be mapped to the motives and routes presented in psychological ownership theory (Pierce et al., 2003). Hassenzahl’s model is based on a hierarchy of three goals: be-goals which relate to the needs or desires of the user; do-goals which reflect the routes used to achieve the be-goals; and motor-goals which are the specific actions performed to achieve the do-goals. Mapping psychological ownership theory to this presents the motives as be-goals, the routes as do-goals and the specific product or system attributes which influence the motor goals. Motives and routes from psychological ownership theory may be familiar to many readers of this chapter but they are summarised below before continuing the discussion.

Psychological ownership presents three motives: efficacy and effectance which is about fulfilling the design to feel competent by impacting the world; self-identity which is about developing public and private identity; and having a place to dwell which is about establishing security through familiar
objects. Psychological ownership also presents three routes: control, self-investment, and gaining an intimate knowledge (Pierce et al., 2003). Together, the motives and routes greatly simplify understanding the process of developing feelings of ownership.

At this point, we can identify two types of actors who influence the fulfilment of the motives through the routes. Primary entities are those individuals and organisations that are critical for the interaction to occur. Examples of primary entities are manufacturers, developers and service providers without whom no interaction could take place with a target object. Auxiliary entities are not essential to creating interactions but can act to aid or inhibit possession from occurring. For instance, a person may feel a sense of ownership for a software package which differentiates that software from other alternatives in the market, i.e. my statistics software. The company that produces the software would be thought of as a primary entity since they are essential to enabling interaction in the first place. A third party may offer tutorials which help users invest effort resulting in better control and stronger intimate knowledge of the software features. This third party would be considered an auxiliary entity who supports the development of feelings of ownership. Understanding these relationships better explains the relationships involved in the process of taking possession of something and can assist in a descriptive analysis and creative structuring of ownership (Baxter et al., 2016b).

The usefulness in identifying these motives, routes, and contributing entities is that the complexity of the problem at hand is greatly reduced. Any user-object relationship can be explained in its constituent parts. The value here is a simple framework through which designers can describe a complex system. When considering ways to enhance or create a new possession, the framework can be used to form and test hypotheses.

Given its focus on user-object interactions, ownership should be thought of as a time-dependent construct. Consequently, while the motives and routes give some indication as to why and how ownership is achieved, there is great value in better understanding the paths users go through with
time to develop or weaken feelings of ownership. Thus, while routes refer to what a person does to fulfil a motive related to ownership, a path is a description of how feelings of ownership develop over time. One or multiple routes may be used in the construction of a path. This is particularly important for design where the interactions with a product are essential in understanding how to influence ownership. A number of archetypical paths to possession and dispossession have emerged from previous work (Baxter and Childs, 2017) and are discussed here for illustration purposes.

**Paths to possession and dispossession**

The description of the paths to possession depends on acknowledging the nature of the routes to ownership. Where self-investment and control require user action to be done to an object, intimate knowledge is typically the object communicating something to the user. Feelings of ownership are proportional to the progression down each route. From this, general trends can be extrapolated and mapped to common paths of ownership, see Figure 2. The paths will be contextualised with the simple case of buying clothing though they can be applied to many contexts. One of the most common paths to ownership is that shown by letter B in which a large initial effort is made upfront which may include researching the right type of clothing, searching for the clothing in stores and eventually purchasing the item. Over time, intimate knowledge is gained about the object which increases the overall sense of ownership along with occasional maintenance (self-investment). Path A represents an intervention in which additional effort is made up front which enhances the sense of ownership and then continues to progress with time. For clothing, this may involve getting clothes tailored to fit. Alternatively, if it is a specialty piece of clothing such as a winter coat used for snow sports, additional control may be gained by learning about various features not readily apparent. Path C occurs when no upfront effort is made. For instance, clothes might be gifted or be part of a uniform for work but over time, users gain intimate knowledge of these and may also strive to customise them in some way resulting in feelings of ownership. Finally, Path D occurs when an object is perceived to belong to someone else and evidence of the previous user needs to be
removed before it can be taken into the individual’s possession. This is referred to as contaminated interaction (Baxter et al., 2016a; W. L. Baxter et al., 2017) and it occurs frequently with second-hand clothes that may retain smells, markings, or other indicators of prior use. Contaminated interactions are interactions tainted by the presence of some real (e.g. smell from previous user) or imagined (e.g. essence from previous user) contaminant.

In this case, the contamination is shown as negative since the smells may provide negative feelings of ownership. It is possible for contaminated interaction to be positive if the perceived value of the object is enhanced by previous use. For instance, if clothing was previously used by a celebrity or prior use provides a unique narrative that reinforces the person’s identity. If this is the case the path would more closely resemble A in that the intimate knowledge added at the beginning would enhance ownership early.

Figure 2 Four common paths to possession. Source: (Baxter, 2017) reused here under the creative commons license.

Similar paths can be mapped for dispossession as they relate back to an object’s ability to continue satisfying the motives outlined earlier. One of the most common paths of dispossession is that
shown by Line E in which the product abruptly stops fulfilling a motive. This may be due to damage forcing an upgrade or simply the desire for a replacement, i.e. replacing last year’s clothes with this year’s styles. This type of replacement makes it easy for a person to dispossess of the old object as a new object will often take its place. Line G occurs when a user grows distant from an object. With clothing this may be that an item is in storage for some time and though known, slowly becomes less relevant as the user’s style or practical need moves away from what the garment offers. Line F is similar to G but differs in that it is an active relationship. For instance, a person may be using a piece of clothing but it gets worn out and, over time, the user would get ready to replace the item. The final line, H, is dotted to represent nostalgia of a beloved item. In this case, the item may or may not still be around physically but it transfers in meaning to a nostalgic item whose value is maintained. If the item no longer exists physically, it is preserved through photographs, stories, or other means to aid in recall. This may be a wedding dress which is no longer in the person’s physical possession but is kept alive in photos.

Figure 3 Four common paths to dispossess. Source: (Baxter, 2017) reused here under the creative commons license
There are as many paths as there are ways to interact with objects so these eight paths are only intended to act as archetypes to inform decision making. Importantly, ownership is a mental state here, not a legal construct. Thus, ownership may begin at the first point of interaction, not at the point of sale. This understanding has many useful applications. For instance, if a product is sold as it climbs the path it will likely be valued higher and collect a higher price. If the product is seen as contaminated it may be necessary to first cleanse the object in some way before selling it.

The area under each path might be thought of as required effort. More effort is needed for Path A than for Path B and more still for Path D since it requires an ability to first scrub it of a previous user before taking ownership. Careful design can seek to exploit understanding these paths and the effort required. A notable example of this is seen with Path D. If engaging in an access-based model, for instance, many users report experiencing some kind of contaminated interaction. The entire interaction is short enough that they disengage with a negative experience. Design should seek to mitigate such contamination and consider the length of use that makes the most sense to gain meaning from the interaction.

**A new frame for design**

A human-centred design approach to ownership begins with considerations of human needs and desires. At the heart of the issue is then identifying why a person wants to own and what they get from ownership. This contrasts with a legal-centric perspective of ownership in which the starting point is often a discussion of the rights to and derived from ownership. Thus, the approach here is one in which the primary objective is to consider how to create meaningful interactions for a user and how laws, policies and norms reinforce or threaten such interactions. While there may be some limitations to changing laws around ownership that have long existed, many of the ways in which ownership is changing are still in flux and there is need to fundamentally rethink what ownership
means in these contexts. Thus, the boundaries of this human-centred ownership are defined by the person’s own interactions and experiences with an object within a larger system.

Adopting a human-centred approach to ownership, we acknowledge that ownership is an innate human desire (Belk, 1982; James, 1890). Being able to possess offers meaning to people individually but is also necessary to give meaning to many interpersonal interactions. For instance, without an understanding of possession, buying, stealing, lending or gifting would be senseless (Snare, 1972). Design should consider what it means to design a possession and how the careful crafting of products, services, and systems can make a meaningful ownership experience.

We propose a fundamental shift in how design is framed. By shifting from the design of a product to the design of a possession, designers are forced to focus on the dynamic relationship people have with objects. It is no longer enough to mass produce an object that will be handed over at the point of sale and never again be considered. Nor is it enough to design a service or system in which a product resides. Designers concerned with designing possessions should care about creating meaningful experiences with objects that people feel they own. This requires considering the product, services, and experiences all contributing to the overall user experience.

Robert Garson, a New York City-based attorney, highlights the importance of designing possessions in an experience he had with the car-sharing service Zipcar (Garson, 2016). In what seems to be a normal routine, he was heading out for the day with his family. He and his wife had loaded their children in the car and he began driving. After beginning their journey, his wife noticed a small vial of white powder next to her seat presumably left there by the previous driver. Upon examination, Garson determined the vial was cocaine—a conclusion aided by years of experience defending serious crime in England. Though this was admittedly a conjecture, it speaks to a larger issue. How do you design a positive user experience when multiple people possess the car in a short period of time? Zipcar already tries to address this through their “six rules of the road” which all drivers must agree to: report damage, keep it clean, no smoking, fill ‘er up, return on time, and pets in carriers
As Garson points out, however, it seems that Zipcar was not prepared to deal with a situation in which an illegal substance was left in the car and law enforcement likely is not either. “But officer, I swear I don’t know anything about that” are words familiar to all law enforcement.

Garson’s experience is an example of the need to design possessions. Possession is indeed the right term here even though he had no legal ownership for the car because he felt the car was his. This is evidenced both by the title of his article—My Zipcar had a vial of coke in it—and his concern over what would happen if law enforcement found the item in his car. The car, service and system had all been designed but what had not been fully considered is the strength and volatility of the relationship people have with that possession. Understanding the nuances of ownership in terms of a relationship formed between a person and an object is increasingly important for design. Unfortunately, as noted earlier, much still needs to be done in terms of addressing this more fully.

**What design can offer to the ownership experience**

Designers can make significant contributions to facilitate the development of feelings of ownership. The most basic and familiar contribution is to create objects that people will want to take into their possession. As a prerequisite to the fulfilment of any routes, a product must attract some kind of interaction (Pierce et al., 2003). Decisions as fundamental as material selection can influence feelings of ownership (Peck and Shu, 2009). There are several other ways in which design aids ownership. Below are four areas we propose design can immediately make a significant contribution.

1. Identify meaning in non-ownership
2. Structure the ownership experiences
3. Limit redundant effort
4. Mitigate contaminated interaction
Identify meaning in non-ownership

A rising number of business models are moving towards non-ownership schemes with the development of product service systems. Among the motivations for these models is the option to make better use of resources and find new ways to capture user value. Despite these models being investigated for many years now, users still prefer traditional ownership in many cases over these models (Tukker, 2013). It seems that the issue lies in the inability of companies to recognize where the value of ownership is for users. An entrepreneur working in the area explained it this way, “everything made sense except that nobody gives a shit. They go buy [a drill]. Or they just bang a screwdriver through the wall” (Kessler, 2015). The quote pays tribute to the statement from Theodore Levitt describing how people want a hole, not the drill. It seems, however, that we have not yet figured out how to offer them the value they seek.

The motives outlined in psychological ownership (Pierce et al., 2003) suggest three things people seek from ownership: efficacy and effectance, having a place to dwell, and self-identity. In most cases, non-ownership business models promote their offerings based on convenience or cost savings. This might most closely be related to the efficacy and effectance motive since they suggest that with these offerings people can better influence their world, e.g. get access to tools when they want for a lower price. In many cases, however, the offerings are still not convenient nor do they fulfil the other motives. Rather than talking about ownership, designers might start with the three motives of psychological ownership and explore new ways to fulfil the value sought by users.

Structure the ownership experiences

The interactions needed to develop ownership can be designed into the offering in creative ways. An interesting example of this comes from a strand of architecture which believes housing should not be a static offering but a dynamic process of co-creation together with the tenants (Turner, 1972). Proponents of this method tend to identify the most difficult parts of housing projects, particularly
for low-income housing, and leverage funding to build those sections first. The tenants then maintain a high sense of control regarding how the remainder of their property is formed. Alejandro Aravena and the architectural firm Elemental (www.elementalchile.cl) have conceptualized this in several projects in which they build half a home but leave the other half for the residents to build out when and how they like. The result is a home that tenants can call theirs. As with this case, design can structure specific interactions resulting in a stronger sense of ownership.

Limit redundant effort

The interactions involved in developing feelings of ownership for something require effort as represented by the area under the curves in Figure 2. Traditionally, this effort may be seen in the set-up phase of engaging with a product where a user learns to use an interface or establishes personal settings. There is great value in this effort in terms of helping establish feelings of ownership and loyalty to an offering. However, the effort invested in a product can be a deterrent for adoption if it is seen as a disproportional burden relative to the value that will be achieved.

While this effort is itself an important part of developing feelings of ownership, designers should work to minimise any redundant effort required from users. Redundant effort is effort which has already been expelled once and should therefore be carried over through the design of the system. One area where this is important is in the creation of mental models regarding how a product should be used. For instance, one respondent in a previous study reported her continued use of a particular type of camera simply because she is most comfortable with the interface she has spent years mastering (Baxter et al., 2016b). In this example, her knowledge of the interface meant she did not have to learn a new camera setup when upgrading her model and thus saved a great deal of effort. Likewise, companies should be wary of making too large of changes in product iterations as they require significant effort from users to learn the new interface. In other cases, it is possible for
multiple users to engage in a single offering and all feel a strong sense of ownership. This is particularly the case if the offering recalls the preferences of previous users. This is common with various digital technology such as phones, computers, and cars which remember different users’ preferences (Baxter et al., 2015).

**Mitigate contaminated interaction**

The exchange of items between uses and users make them susceptible to contamination. Contaminated interaction moderates ownership and often requires that users erase traces of prior use before they can take possession of it themselves (McCracken, 1986). This is a particularly salient issue in access-based consumption where objects quickly move between different users. With access, users often do not engage with the product long enough to be willing to invest the effort to clean and take ownership of the object, see Line D in Figure 2. In such cases contamination can provide negative experiences and prevent users from engaging in the wider brand community (Bardhi and Eckhardt, 2012). Contamination is also prevalent in other situations of reuse including with entirely remanufactured goods such as food processors (Abbey et al., 2015).

The issue of contaminated interaction will be of increasing concern in situations in which multiple users engage with the same object. This is true of digital and physical interactions (W. L. Baxter et al., 2017). Designers can help identify ways to mitigate contaminated interaction. Work by the authors suggests that there are a finite number of design strategies that are used to counter contaminated interaction (W. Baxter et al., 2017). These strategies can be a source of inspiration for future design interventions.

**Conclusions**

This chapter has examined the role of design in creating ownership. We have argued for the need to shift the frame in design from designing products to possessions. The benefit of this approach is that
a stronger emphasis is placed on creating meaningful interactions between people and objects. This is particularly needed with new dimensions for ownership in design. Building on psychological ownership theory, designers can use the motives, routes, and paths of ownership to guide thinking and enable better design. We identify four specific ways that design can aid in creating ownership. First, designers can help identify meaning in non-ownership contexts such as access-based consumption. Second, designers can help structure the specific interactions that lead to the experience of ownership. Third, designers can help limit redundant effort required by users in establishing ownership. Finally, design can help mitigate contaminated interaction to enable ownership to occur.

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