The relevance of the concepts of affordance and behavior setting for housing research

Henny Coolen

Department OTB Research for the Built Environment

Faculty of Architecture and the Built Environment

Delft University of Technology

Delft, The Netherlands

h.c.c.h.coolen@tudelft.nl

Abstract

The housing field has been characterized as the set of relationships involved in the demand, supply, distribution and price of housing. Although many conceptual frameworks have been used to describe and understand this set of relationships, most of these approaches lack a convincing focus on the actors in the housing system, particularly the inhabitants of dwellings. One perspective that tries to overcome these shortcomings is the pathways approach to studying housing in which the subjective nature of meanings held by households is at the centre of the analysis. But choosing the household as the basic unit of analysis confronts this approach with a problem, because the highlighting of subjective and psychological aspects of dwelling would make it more natural to use the individual as the basic unit of analysis. In this paper a dwelling is conceptualized as a locale for certain social practices of the household in the course of a day, it is the place where the routine activities and interactions of the different members of the household take place and intersect, while the locale's settings are also used to constitute meaning to the interactions and to the individual activities and behaviors of the household members. This conceptualization of a dwelling inevitably leads to the household being opened up, because both the household and the individual household members play a part in it. Conceptually, this is where the notions of affordance and behavior setting come into play. Both concepts emphasize the mutuality of people and their environment. Affordances focus on individual-environment relations, while behavior settings conceptualize collective-environment relations. Since both types of relations appear in housing, both concepts are needed for studying housing. But the concepts of affordance and behavior setting are also intimately related, because specific affordances are often embedded in particular settings. In the case of contemporary dwellings these are settings subdivided into several sub-locales that zone time-space in relation to social practices and individual activities and that provide context to both household and individual practices and behaviors. So the notions of affordance and behavior setting make it possible to conceptually relate the extra-individual level of the household to the individual level of the household member. In the paper this framework will be further elaborated.

Introduction

The housing field may be characterized as the set of relationships involved in the production, consumption, distribution and price of housing. Although many conceptual frameworks are used to describe and understand this set of relationships, most of these approaches lack a convincing focus on the actors in the housing system, particularly the inhabitants of dwellings. Due to several trends and developments with respect to housing since World War II a more individualized approach to housing, reflecting the ability to make one's life through choice and avoiding the inadequacies of traditional approaches, is needed (Clapham, 2005; Coolen, 2014)). Such an approach is presented by Clapham (2005) in his notion of a housing pathway. A housing pathway is defined as patterns of interaction concerning house and home, over time and space. According to Clapham housing is consumed by households, where a household may consist of one or more persons, so the basic unit of analysis for housing is the household, despite the problems inherent in using the concept of a household (Kemeny, 1992). Although nowadays many households are one-person households, it is assumed here that households consist of at least two individuals. This assumption does not detract from the generality of our line of reasoning. The housing pathway of a household is the continually changing set of relationships and interactions which it experiences over time in its consumption of housing. One of the reasons for looking at this approach is that it is a framework, which places the subjective nature of meanings held by households at the center of the analysis (Clapham, 2005). A housing pathway also includes such elements as the career-lifecycle of households, mobility and the idea of a housing career. As Clapham acknowledges his conceptualization of a housing pathway leans on Giddens' structuration theory and on Hagerstrand's time-space geography. It draws attention to the social practices inherent in the movement of households through the housing field during their life-course, and also to the locales of social practices, some of the most important of which are the dwelling and the local neighborhood.

Especially Giddens' notion of a 'locale' seems to be important from the perspective of housing. "Social practices can be considered as patterns of interaction that are ordered across time and space. Locales refer to the use of space to provide the settings of interaction, the settings of interaction in turn being essential to specifying its contextuality. It is usually possible to designate locales in terms of their physical properties, either as features of the material world or, more commonly, as combinations of those features and human artefacts. But locales cannot be described in those terms alone. A 'house' is grasped as such only if the observer recognizes that it is a 'dwelling' with a range of other properties specified by the modes of its utilization in human activity. Properties of the settings that form locales are employed in a chronic way by agents in the constitution of encounters across space and time, in the sense that they can be viewed as 'stations' in which the routine activities of different individuals intersect. But the features of settings are also used, in a routine manner, to constitute the meaningful content of interaction. Context thus connects the most intimate and detailed components of interaction to much broader properties of the institutionalization of

social life. Locales may range from a room in a house, a street corner, the shop floor of a factory , towns and cities, to the territorially demarcated areas by nation states. …
Locales are typically internally regionalized, and the regions within them are of critical importance in constituting contexts of interaction. Regionalization should be understood not merely as localization in space but as referring to the zoning of time-space in relation to routinized social practices. Thus a private house is a locale which is a 'station' for a large cluster of interactions in the course of a day. Houses in contemporary societies are regionalized into floors, halls, and rooms. But the various rooms of the house are zoned differently in time as well, for instance the division between day and night." (Giddens, 1984, chapter 3)

In terms of Giddens' conceptualization a house may be described as a locale for certain social practices of the household in the course of a day, it is the place where the activities and interactions of the different members of the household take place and intersect. By using the locale's settings for these social and individual practices they constitute meaning to the activities and interactions. Contemporary houses are also regionalized into several sub-locales that zone time-space in relation to all practices that take place in it, and that provide context to both household and individual activities and behaviors.

The importance of the conceptualization of 'locales' as the places that provide the settings for activities and social interaction, while at the same time specifying their context cannot be overestimated. Although this idea is not new (see below Barker's concept of the behavior setting), it is still worth emphasizing it. Social interaction and individual activities take place in locales, which also provide the context for the meaning of these interactions and activities! However, choosing the household as the basic unit of analysis in this context confronts us with a problem, because the highlighting of psychological aspects of housing would make it more natural to use the individual as the basic unit of analysis (c.f. Bengtsson, 2002). Although it may be right that the household is the natural unit in which people consume housing and make decisions about it and although Clapham (2005) states that throughout his book the focus is on individual and household pathways, the contention that the pathway approach inevitably leads to the 'household being opened up' is problematic, because the pathway approach seems to lack the conceptual framework to completely do so. This is where environment behavior research (EBR) in general and the ecological approach to people-environment relations in particular may come into play.

One of the central tenets in environment behavior research (EBR) is the reciprocity of people and their environment (Gifford 2001; Rapoport 2005). Human beings use and change the environment, and their experiences and behavior are influenced by the environment. Given this two-way relationship between human beings and their environments there must be mechanisms that link them. A central aim of EBR is to identify and study these mechanisms in order to make the environment more humane and improve our relationship with the environment. A theory that has been put forward to grasp the mutuality of people and environments is Gibson's theory of affordances. This theory aims at describing and

understanding individual-environment relations. As has been hinted at above there are also collective-environment relationships, for instance the household consuming housing. These type of relations have been conceptualized by Barker (1968) in his notion of the behavior setting. I will first deal with the concepts of affordances and behavior settings separately. Subsequently, I shall discuss the relationship between both concepts and their relevance for housing research.

Affordances

Gibson developed his theory of affordances as part of his research on visual perception. He believed that we do not perceive objects in the environment in terms of their physical characteristics but in terms of their ecological meanings which he called affordances. According to Gibson (all emphases are his): "The *affordances* of the environment are what it *offers* the animal, what it *provides* or *furnishes*, either for good or ill. The verb *to afford* is found in the dictionary, but the noun *affordance* is not. I have made it up. I mean by it something that refers to both the environment and the animal in a way that no existing term does. It implies the complementarity of the animal and the environment. … If a terrestrial surface is nearly horizontal (instead of slanted), nearly flat (instead of convex or concave), and sufficiently extended (relative to the size of the animal) and if its substance is rigid (relative to the weight of the animal), then the surface *affords support*. … Note that the four properties listed - horizontal, flat, extended, and rigid - would be *physical* properties of a surface if they were measured with the scales and standard units used in physics. As an affordance of support for a species of animal, however, they have to be measured *relative to the animal*. They are unique for that animal. They are not just abstract physical properties. They have unity relative to the posture and behavior of the animal being considered. … If a surface of support with the four properties is also knee-high above the ground, it affords sitting on. We call it a *seat* in general, or a stool, bench, chair, and so on, in particular. It may be natural like a ledge or artificial like a couch. It may have various shapes, as long as its functional layout is that of a seat. The color and texture of the surface are irrelevant. Knee-high for a child is not the same as knee-high for an adult, so the affordance is relative to the size of the individual." (Gibson, 1979, pp. 127-128) "… they are *ecological*, in the sense that they are properties of the environment *relative to* an animal." (Gibson, 1982).

The concept of affordances most basically emphasizes the congruence between structural features of the environment and abilities of individuals. When an individual perceives this congruence, there is awareness of a fit. In this sense environmental features are experienced as having meaning for the individual. So, meaning resides in the individual-environment congruence and is thus relational. Some other examples of affordances are: air affords breathing, unimpeded locomotion, and visual perception; solids afford various kind of manufacture.

According to Gibson (1982) not only objects but also substances, places, events and artifacts have affordances. But the richest and most elaborate affordances are provided by other animals and, for us, other people (Gibson, 1979). They are so different from ordinary objects that infants learn almost immediately to distinguish them from plants and non-living things. They interact with the observer and with one another. They provide mutual and reciprocal affordances at extremely high levels of affordances. The other person, the alter as opposed to ego, is an ecological object, but it is not merely an object, and we do right to speak of you and he instead of it.

Affordances are characterized by several properties. According to Gibson affordances imply the *complementarity* of the animal and the environment. This property defines the relational character of affordances. Affordances are relationships between certain animals and certain things in the environment. Moreover, affordances are relative to specific users. Environmental features can afford different behaviors to different users. The *polarity* of affordances was also indicated by Gibson. Positive affordances are potentially beneficial to the user, while negative affordances are potentially harmful. Any part of the environment may also possess a *multiplicity* of affordances. For instance, water affords drinking, pouring, washing, and bathing. According to Maier and Fadel (2009a) even if an environmental feature possesses an affordance, there is still room to describe how well this feature affords a specific use in terms of *quality*. Some seats afford sitting on better than others. Finally, Maier and Fadel indicate that affordances are *form dependent*. By definition, it is the form (i.e. structure) of environmental features that determines what they afford to specific users. This is an important difference with the concept of function, since functions and functional decomposition are form independent (Maier and Fadel, 2009a).

Gibson's theory is a general one in which the environment refers to the surroundings of all organisms that perceive and behave, and in which affordances always express a complementary relationship between the environment and such an animal. In the context of housing studies we can view the environment as the built environment, i.e. artifacts, and consider the typical animals in them to be human beings. Moreover, our focus here will be on the dwelling and the residential environment in which this dwelling is located and not on the built environment in general. With respect to dwellings and residential environments some simple examples of affordances are: dwellings afford shelter, concealment, storage, comfort, privacy; a kitchen affords cooking; a bathroom affords personal hygiene. Moreover, dwelling provide the affordances of the other members of the household. And in the residential environment public green spaces afford the experience of nature and livability, and a local supermarket affords daily shopping, while all these public places also provide the affordances, positive or negative, of other human beings.

Recently a few authors have argued that if the concept of affordances is relevant in EBR this might also be the case for architectural theory, design and practice (Tweed, 2001; Koutamanis, 2006; Maier et al.,2009). They argue that in architectural theory affordances can be used as a conceptual framework to understand the relationship between dwelling

environments and occupants. The concept of affordances also allows for a common theoretical basis that improves the design process in terms of communication and transfer of information between the different phases of the design process and between the different professionals involved in the planning, designing and building of dwelling environments. With regard to architectural practice affordances can be used as a tool to evaluate the connection between the intentions of the design with how the artifact is actually used.

Behavior settings

Barker who originally started his research and fieldwork with the idea of explaining individual behavior, subsequently developed the idea of a behavior setting: a higher order environmental structure that is congruent with respect to a certain behavior pattern. A behavior setting has both structural and dynamic attributes. "On the structural side, a behavior setting consists of one or more standing patterns of behavior-and-milieu, with the milieu circumjacent and synomorphic to the behavior. On the dynamic side, the behavior-milieu parts of a behavior setting, the synomorphs, have a specified degree of interdependence among themselves that is greater than their interdependence with parts of other behavior settings." (Barker, 1968, p. 18). The essential attributes of behavior settings are:

1. 'A *standing pattern of behavior* is another behavior unit. It is a bounded pattern in the behavior of men, en masse. … A standing pattern of behavior is a discrete behavior entity with univocal temporal-spatial coordinates; a basketball game, a worship service, or a piano lesson has, in each case, a precise and delimited position in time and space. Furthermore, a standing pattern of behavior is not a characteristic of the particular individuals involved; it is an extra-individual behavior phenomenon; it has its unique characteristics that persist when the participants change.' (Barker, 1968, p. 18

2. 'It consists of standing patterns of behavior-*and-milieu*. The behavior patterns of a behavior setting are attached to a particular constellation of nonbehavioral phenomena. Both man made parts … and natural features … can comprise the milieu of a behavior setting. … The milieu of a behavior setting exists independently of the standing pattern of behavior and independently of anyone's perception of the setting.' (Barker, 1968, pp. 18-19)

3. 'The milieu is *circumjacent* to the behavior. Circumjacent means surrounding (enclosing, environing, encompassing); it describes an essential attribute of the milieu of a behavior setting. The milieu of a setting is circumjacent to the standing pattern of behavior. The temporal and physical boundaries of the milieu surround the behavior pattern without a break, as in the case of a store that opens at 8:00 A.M. and closes at 6:00 P.M.' (Barker, 1968, p. 19)

4. 'The milieu is *synomorphic* to the behavior. Synomorphic means similar in structure; it describes an essential feature of the relationship between the behavior and the milieu

of a behavior setting. The synomorphy of the boundary of the behavior and the boundary of the milieu is striking and fundamental: the boundary of a football field is the boundary of the game … But the synomorphy of behavior and milieu extends, also, to the fine, interior structure of a behavior setting. In the case of a worship service, both the pews (milieu) and the listening congregation (behavior) face the pulpit (milieu) and the preaching pastor (behavior).' (Barker, 1968, p. 18)

5. 'The *behavior-milieu parts* are called synomorphs. The physical sciences have avoided phenemona with behavior as a component, and the behavioral sciences have avoided phenomena with physical things and conditions as essential elements. … We lack a science of things and occurences that have both physical and behavioral attributes. Behavior setting are such phenomena; they consist of behavior-and-circumjacent-synomorphic-milieu entities. We call these parts of a behavior setting behavior-milieu synomorphs, or, more briefly, synomorphs. Structurally a behavior setting is a set of such synomorphs.' (Barker, 1968, pp. 19-20)

6. 'The synomorphs have a specified degree of interdependence. … behavior-milieu synomorphs are more or less interdependent. … the synomorphs have a greater degree of interdependence among themselves than with parts of other behavior settings.' (Barker, 1968, pp. 20-22)

A behavior setting provides congruence between the physical and designed features of settings, on the one hand, and the collective activities that take place in the setting, on the other. The meaning of the setting - that is, what type of place it is and what kind of behaviors are appropriate in it - resides in the perceived synomorphic relations between milieu features and behavior. Although it is often portrayed that the physical and designed features of a BS provide the opportunities for collective action this seems to be only part of the story. Many BSs can only provide the patterns of behavior through efforts of other people without the participation of whom the settings cannot 'operate'. For instance, a worship service cannot take place without the presence of the preaching pastor. And a shop cannot operate without the store personnel such as a store manager, cashiers and stock clerks. Although it may be argued that these people are part of the patterns of behavior, as Barker seems to do, it must be recognized that their role is different from that of the people experiencing the standing pattern of behavior. And although Barker argues that people who occupy a particular BS are to a certain degree interdependent in the sense that actions by one person are likely to affect others in the BS, it seems that the people that keep the BS 'operating' are more supportive of the standing patterns of behavior than experiencing them themselves while operating the BS. So, the roles of the people participating in a BS may be asymmetric.

Affordances and behavior settings: relationships
Although Barker and Gibson were hardly aware of each other's work, it is according to Heft (2001) related because they share the same metaphysics. As we have seen Barker was

involved with extra-individual – environment congruence, which he called synomorphy, while Gibson focused on individual – environment correspondence, called affordances. In particular the notions of behavior setting, synomorphy and affordance seem conceptually related. In order to elaborate this relationship one has to realize that people's behavior is goal-oriented. In ecological psychology this intentional aspect is mainly focused on action, but Clapham (2011) convincingly argues for broadening the concept of intention aiming it more generally at well-being. He describes well-being as "…subjectively defined contentment with life that is more than a temporary mood state" (Clapham, 2011, p. 368). The intentional aspects of people's behaviors become most evident in the selection, discovery, and the creation of meaningful environmental features. Individuals selectively engage particular objects in their surround; individuals typically make choices from among the range of potential features in a setting to support some behavior. However, individuals do not have unconstrained choice. Factors outside of their control may limit the range of socially and/or culturally sanctioned choices. So there is self-selection of affordances but often within constraints.

Intentionality is also apparent in the processes through which individuals learn about and discover the features of objects and the affordances in their surroundings. This is not a random process; which objects are selected in the first place is delimited by the perceived congruence between an object's features and the individual's functional capabilities and intentions. This reciprocity gives rise to exploration and discovery within constraints. Finding novel uses for familiar objects is a particular satisfying way for new affordances to be discovered. Actions involving the learning about environmental features are frequently guided by others. Throughout life, most apparently during childhood, individuals are explicitly taught, often in very subtle ways, to recognize and utilize the functional features of objects. Individuals also learn about the meanings of objects by observing the behavior of others. Finally, affordances are sometimes created when the range of possibilities available in the environment are insufficient to meet certain goals. The environment is comprised of meaningful features that were created by an individual or a group of individuals at some time. This omnipresent fact about the world is one manifestation of the fundamental reciprocity of individuals and environment. Individuals do not merely take the world as they find it, the environment is continually being modified. Many of these activities are efforts to create new affordances in order to address specific individual and socio-cultural needs.

In many cases, meaningful features of the environment that are created reflect individual's knowledge about environment-behavior relations. This means that in a functional sense every object has a meaning that distinguishes it from other objects. This meaning constitutes the nature of the object for the individual for whom the object exists. One confronts an object, sees it, refers to it, talks about it, or acts toward it in terms of the meaning it has for one. No objects exist, in a functional sense, for a person except in terms of the meaning it has for the person. Meaning is not something that is inherent in an object; it is not an intrinsic part or attribute of the object. The meaning of an object exists in a relation between the object and the

individual for whom it is an object; its meaning exists in how the individual designates the object, and in this sense an object may have different meanings for different human beings, while it may also have different meanings for the same individual in different contexts. Given Gibson's conceptualization of affordances and taking the intentional aspect of people's behavior into account, it follows that people's participation in behavior settings is individually motivated in the first place. In the typical examples of behavior settings mentioned by Barker (1968) – worship service, basketball game, piano lesson – the individual participates because he/she wants to practice religion, wants to play basketball or wants to watch a basketball game, wants to learn how to play the piano. By participating in behavior settings the individual realizes certain affordances and at the same time contributes to its overall structure and becomes part of it in a functional sense. Given the intimate relationships between affordances and behavior-milieu synomorphs it becomes apparent that in many cases affordances can be conceptualized as part of behavior settings. Furthermore, settings can be considered as places where characteristics with particular affordance properties are likely to be found. People recognize that certain affordances are typically found among the characteristics of particular behavior settings, it has become part of their knowledge about environment-behavior relations.

At this point it provides further insight to realize that people participate large parts of their daily lives in behavior settings – at home, at work, at school – not only because our society is organized that way but also because of the fact that for the fulfillment of their wants and needs they are dependent not only on these behavior settings but also on others such as shops, churches, theatres, and so on. Gibson realized this when he remarked: "The habitat of a given animal contains places. A place is not an object with definite boundaries but a region. … The different places of a habitat may have different affordances.' (Gibson, 1986, p. 136). And Heft (2007) argues that the most thoroughgoing analysis of places from this perspective is given by Barker in his work on behavior settings. Although our habitat consists of places one has to realize that not all places are behavior settings (Heft, 2001). One of the defining characteristics of a behavior setting is that it facilitates collective behavior of men en masse. Places such as bus stops, sidewalks, and parking lots seem to miss this defining characteristic. Although these places have an extra-individual character in the sense that their features are not specified relative to a particular individual but more in relation to an 'average' individual, they nevertheless are not features of ongoing collective behavior. Heft (2001) calls the possibilities for action that these places provide 'affordances of places' and distinguishes them from the affordances that behavior settings provide, which he calls 'affordances in places'.

Housing research: affordances and behavior settings
What is the relevance of the concepts of affordance and behavior setting for housing research?

A house has been described in Giddens' terms as a locale for certain social practices of the household in the course of a day, it is the place where the activities and interactions of the different members of the household take place and intersect, and by using the locale's settings – living room, kitchen, dining room, individual rooms, bathroom, garden, and so on - for these social and individual practices they constitute meaning to the activities and interactions. Given this description it is evident that a dwelling can be considered a behavior setting that provides congruence between the features of its settings and the collective activities of the household. At the same time it is also clear that the dwelling is a place that provides affordances for the individual members of the household. This is not just a matter of definition in which a house is described in a certain way but an empirical reality, that emerges from research on the use of houses (see for instance Meesters, 2009). The house is a place that provides opportunities for collective actions of the household, behavior-milieu synomorphs, such as eating together-dining room, being together with the nuclear family-suitable area in the living room, and going to bed and sleep at night-suitable arrangement of rooms and sleeping places. But it also provides individual-environment congruence – affordances – for many activities of the individuals that form the household such as sleeping-(bed)room, studying-own room, working at home-own room, relaxation-living room/garden, enjoying one's hobby-own room/attic/garage, and so on. Social, cultural and economic changes have not only led to changing family structures but also to different attitudes towards working at home, privacy, comfort, security, an aging population, and a growing respect for the natural environment. These developments are evidently reflected into a growing demand for more quality in our dwellings (Dowling, 2008), which means that we require modern dwellings to provide both appropriate behavior-milieu synomorphs for the household as well as high quality affordances for the individual household members. And the regionalization of contemporary houses into floors, halls and rooms reflects more than ever before these collective and individual facets of dwelling.

In what follows the consequences of considering the dwelling in housing research as a behavior setting that provides both behavior-milieu synomorphs to the household collectively as well as individual-environment congruence to the household members will be sketched for research on housing preferences. Housing preferences have been studied from different theoretical perspectives and with a great variety of methodological approaches. It is an area of interest to researchers in fields such as economics, social geography, housing studies, and environment-behavior studies (Jansen et al. 2011). Apparently, what dwelling people prefer can be measured in many different ways. Although the approaches to measuring housing preferences vary, they also have certain aspects in common. First, they all assume that houses can be described and evaluated in terms of a bundle of featues, each of which has a limited number of levels, often two or three. Second, they all assume that people derive some satisfaction from each of the attribute levels, and in some approaches this satisfaction is expressed in terms of a part-worth utility. Third, all the approaches assume, albeit some implicitly, that people combine the satisfactions for the different attribute levels into an

overall preference for a dwelling, but they may differ in the specification of the combination rule. Furthermore, preliminary to every approach is the determination of the salient housing attributes and the relevant levels of these attributes. So, in housing preference research the house is dismantled into a number of salient features which are assumed to provide people some satisfaction.

Coolen (2014) argues that due to several societal, cultural and economic trends a more individualized approach to the development, design and building of dwellings seems needed. With this in mind he develops an affordance based approach to housing preferences. In this approach the initial focus is on the dwelling process, on the objectives and activities that motivate people to prefer a certain dwelling. The house is not an end in itself, but it is a means to an end. Starting point for the elicitation of housing preferences are now the inhabitants' goals and activities with respect to the dwelling, and subsequently the final design consists of a dwelling that affords these objectives and activities as much as possible. In other words, in this approach one starts with the elicitation of affordances and not with the housing features as is common in housing preference research. After having established the affordances that one wants the dwelling to provide, one may subsequently relate them to features of the dwelling that are appropriate for providing these affordances. In the end this may lead to a design of the dwelling that provides as much people-environment congruence as possible. The approach described by Coolen (2014) is entirely oriented towards the individual's affordances, which in itself seems an improvement over existing methods for measuring housing preferences, but by doing so systematically ignores the extra-individual level of the household and the related behavior-milieu synomorphs. Although synomorphs may turn up during the process of elicitation of affordances, this is more a byproduct than the result of the procedure. It follows that the affordance based approach to measuring housing preferences results only partly in the appropriate behavior-milieu congruence that is relevant for dwelling. And that for truly measuring behavior-environment congruence with respect to the dwelling the approach should be extended to also include synomorphs.

Conclusion

In this paper a house is conceptualized as as a locale for certain social practices of the household in the course of a day, it is the place where the routine activities and interactions of the different members of the household take place and intersect, while the locale's setting are also used to constitute meaning to the interactions and to the individual activities and behaviors of the household members. Analytically this conceptualization requires relating the extra-individual level of the household to the individual level of the household members. From the perspective of people-environment relations Barker's notion of behavior settings and Gibson's idea of affordances may fulfil this requirement. In ecological terms a dwelling is a place that provides behavior-milieu synomorphs to the household as well as affordances to the individual members of the household which they experience by virtue of being a

household member. The consideration that behavior settings are places that provide particular affordance properties is certainly appropriate for dwellings. By dwelling in a house individual household members experience certain affordances and at the same time they contribute to the overall structure of the household by being part of it and in this role they experience certain behavior-milieu congruence. Empirical research on the use of dwellings corroborates this view.

It was noticed in the introduction that in housing research the household is often considered to be the unit of analysis and that this assumption creates problems for studying for instance psychological aspects of housing such as meanings which would make it more natural to use the individual as the basic unit of analysis. Considering the dwelling as a behavior setting and realizing that behavior settings are places where particular affordances are likely to be found, leads to the insight that neither the household nor the individual are the basic units of analyses, but that both the individual *and* the household are the units of analyses. The dwelling provides synomorphs to the household that dwells in it and affordances to the members of the household which they experience by virtue of being a household member. The perspective of one's study determines which one of these units will be the starting point for the analyses. Nevertheless whatever the starting point is, though, one must always realize that the level of the individual is intimately related to the extra-individual level of the household.

Realizing that both the individual and the household are the units of analysis in housing research immediately raises the question who is to be interviewed and/or observed about what when performing housing research. Should this be the individual members of the household about both affordances and synomorphs followed by some form of aggregation, the household as a group about both affordances and behavior-milieu synomorphs, or the individual household members about their affordances and the household collectively about behavior-milieu congruence, or maybe even some other form.

References

Barker, R.G. (1968), Ecological Psychology. Concepts and Methods for Studying the Environment of Human Behavior, Stanford University Press, Stanford.

Bengtson, B. (2002), Promising but not Post Modern. A Comment on David Clapham's Concept of Housing Pathways, Housing, Theory and Society, 19, pp. 69-70.

Clapham, D. (2005), The Meaning of Housing. A Pathways Approach, The policy Press, Bristol.

Clapham, D. (2011), The Embodied Use of the Material Home, an Affordance Approach, Housing, Theory and Society, 28, pp. 360-376.

Coolen, H. (2014), Affordance Based Housing Preferences, forthcoming.

Dowling, R. (2008) Accommodating Open Plan: Children, Clutter, and Containment in Suburban Houses in Sydney, Australia, Environment and Planning A, 40, pp. 536-549.

Gibson, J.J. (1982), Notes on Affordances, in: E. Reed, R. Jones, J. Gibson (Eds), Reasons for Realism; Selected Essays of James J. Gibson, Lawrence Erlbaum Associates, Hillsdale.

Gibson, J.J. (1986), The Ecological Approach to Visual Perception, Lawrence Erlbaum Associates, Hillsdale.

Giddens, A. (1984), The Constitution of Society, University of California Press, Berkeley.

Gifford, R. (2001), Environmental Psychology. Principles and Practice, Allyn and Bacon, Boston.

Heft, H. (2001), Ecological Psychology in Context. James Gibson, Roger Barker, and the Legacy of William James's Radical Empiricism, Lawrence Erlbaum Associates, Hillsdale.

Heft, H. (2007), The Social Constitution of Perceiver-Environment Reciprocity, Ecological Psychology, 19, pp. 85-105.

Jansen, S., Coolen, H. , Goetgeluk, R. (Eds) (2011), The Measurent and Analysis of Housing Preference and Choice, Springer, Dordrecht.

Kemeny, J. (1992), Housing and Social Theory, Routledge, London.

Maier, J.R.A., Fadel, G.M. (2009) , Affordance Based Design: A Relational Theory for Design, Research in Engineering Design, 20 , pp. 13-27.

Maier, J.R.A., Fadel, G.M., Battisto, D.G. (2009) 2009, An Affordance-Based Approach to Architectural Theory, Design, and Practice, Design Studies, 30 , pp. 393-414.

Meesters, J. (2009), The Meaning of Activities in the Dwelling and the Residential Environment. A Structural Approach in People-Environement Relations, IOS Press, Amsterdam.

Rapoport, A. (2005), Culture, Architecture, and Design, Locke Science Publishing Company, Chicago.

Tweed, C. (2001) , Highlighting the Affordances of Designs. Mutual Realities and Vicarious Environments, in: B. de Vries, J. van Leeuwen, H. Achten (Eds), Computer Aided Architectural Design Futures, Kluwer, Dordrecht.