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Prospect and Refuge Theory: Constructing a Critical Definition for Architecture and Design

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Abstract: The theory of "prospect and refuge" seeks to describe why certain environments feel secure and thereby meet basic human psychological needs. Environments that meet such needs will often provide people with the capacity to observe (prospect) without being seen (refuge). Since its original proposition in 1975, prospect-refuge theory has been discussed and debated by art historians and philosophers and it has also been put into practice by landscape designers. However, it wasn't until 1991, when Grant Hildebrand applied this theory to the architecture of Frank Lloyd Wright, that designers became more aware of, and interested in, this theory. One reason for this interest is that Hildebrand expanded the theory to add several additional spatial dimensions to the concept of prospect, including a love of complexity, exploration and opportunity. Hildebrand identifies that prospect and refuge may result intuitively in the work of an architect who seeks to control the manner in which open and bright spaces are framed spatially. He also applied a variation of the theory to analyse ceiling heights, the size of terraces, and the spatial complexity of a design. While prospect-refuge theory has since been widely used to interpret a range of architects' works, relatively little evidence is available to support its application. After more than two decades of use, scholars still do not know which elements of a design shape the presence of prospect and refuge or whether they are independent factors or are mutually dependent on each other. However, one of the primary impediments to the detailed analysis and testing of prospect-refuge theory is the lack of an accepted definition. Thus, the present paper sets out to construct a critical definition of prospect and refuge theory, drawing on the body of past research that was undertaken originally in art theory and landscape design and later in architectural and interior design.

Keywords: Prospect and Refuge Theory, Habitat Preferences, Design Assessment

INTRODUCTION

Since the early 1990s, the theory of "prospect and refuge" has been widely applied in architectural and design critique to assist the interpretation of the phenomenal and volumetric qualities of certain spaces (Loewen et al. 1993; Scott 1993; Heerwagen 2008). Originally proposed by Jay Appleton (1975), prospect-refuge theory describes an allegedly universal, human behavioural and psychological need for places that allow a person to see, but without being seen. Almost two decades later the architectural historian Grant Hildebrand adopted this concept to support his analysis of the interiors of several of Frank Lloyd Wright's houses. Through this analysis Hildebrand identified in Wright's domestic architecture a repetitive formula describing how the relationship between key elements–including a variation of ceiling heights, the location and size of terraces and openings between adjacent interior and exterior spaces–could evoke a sense of prospect and refuge. It is through Hildebrand's work that prospect-refuge theory has become well known in architecture and since that time it has been applied to a wide range of cases including the works of Le Corbusier

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(Unwin 2010), Alvar Aalto (Roberts 2003), Jørn Utzon (Weston 2002), Glenn Murcutt (Drew 1985) and Sverre Fehn (Unwin 2010). Prospect and refuge theory has been widely adopted in popular design theory (Pollan 1998; Jacobsen et al. 2002; Gallagher 2006) and it has become frequently cited as a basic principle of architecture (Lidwell et al. 2003; Kellert 2005; Lippman 2010), interior design (Augustin 2009) and urban design (Menin 2003; Crankshaw 2008). In its original form, as described by Appleton, it promoted a range of responses in landscape photography (Biberstein 1987; Penner-Bancroft et al. 1999), literature (Britton-Wenner 2006) and spatial psychology (Gärling and Golledge 1993).

At the heart of prospect-refuge theory is the idea that the qualities and attributes of a space–particularly including volume, configuration and access to natural light and outlook–can significantly influence a person's emotional response to that space. For example, Kaplan (1983) maintains that an enclosed space will evoke a feeling of safety or relaxation while a view from that space can add levels of stimulation and excitement. Hildebrand (1991) also argues that a certain combination of spatial and formal complexity and order is required in order to uncover the particular prospect-refuge relationship present in domestic architecture. However, given the body of scholarship that has been published about prospect-refuge theory it might be anticipated that a concise definition was readily available for this theory along with evidence in support of it. Yet, few definitions exist and none of these encapsulate the full range of issues that design scholars have attributed to this theory. Similarly, and not surprisingly, given the lack of a concise definition, clear evidence in support of the theory remains elusive. The present paper is focused on the first of these two dilemmas: the lack of a clear and inclusive definition. Without such a definition, prospect-refuge theory remains effectively un-testable and the large numbers of works on architecture and design that make reference to it are potentially incompatible. However, if a general definition could be developed, and even if some sections of that definition were contingent or flexible, then it might be possible for future research to propose a range of methods to test the veracity of claims made by design scholars like Hildebrand. Such a process is not only important to examine existing claims and to compare the diverse propositions made by other scholars, but it might also lead to evidence that a particular spatial and phenomenal configuration is especially appropriate for human inhabitation.

This paper commences with an overview of the origins of prospect-refuge theory in landscape analysis and a discussion of the results of previous attempts to define prospect-refuge theory in behavioural psychology, urban design and landscape analysis. The second part of the paper undertakes a close analysis of prospect-refuge theory in architecture. Starting with a detailed review of Hildebrand's variation of the theory, this section concludes with a review of previous attempts to define this theory in architecture. In the third part of the paper, those common elements identified in the previous sections are critically compared and then combined to propose a multi-dimensional definition of prospect-refuge theory that is appropriate for architectural and interior design.

Context and Background

The theory of prospect and refuge is derived from the late nineteenth century anthropological belief in the human survival instinct (Darwin 1958); an impulse which directly connects human perceptions or reactions to environmental stimuli. Despite this, the origins of the theory may also be traced, in the Western philosophical tradition at least, to the rationalist concepts of René Descartes and to the separation of the body and mind implicit in Cartesian dualism. Later, German philosopher Edmund Husserl's *Logical Investigations* (1913) introduced a phenomenological philosophy which was concerned with engaged interaction between the human body and the environment. Martin Heidegger, one of Husserl's students, described the relationship between body and environment as one of "being": a continually temporal process of interaction between the body (subject) and its environment (objects). However, in its earliest form phe-

nomenology excluded an objective reality that was independent of humans, as perceiving subjects, and of the individual mind. Husserl is recognised as the founder of phenomenology, one of the major schools of the twentieth-century philosophy and the primary conceptual tradition that has been used historically to relate the human body, and its emotional and physical reactions, to the environment.

Since the rise of phenomenology, many other theories have sought to position the human body as a measure of environmental relationships. For example, studies of proportionality implemented by historians and architects have developed a range of theories describing form in architecture. In 1949, Rudolf Wittkower published *Architectural Principles in the Age of Humanism* in which he explored the search for symmetry, balance and proportional relationships as a fundamental part of human nature. Furthermore, he argues that concepts and beliefs about order must be derived from humans and from their relationship with the environment. In the following year, Le Corbusier (1950) proposed the *Modular* as a universal measure of humanity thereby promoting a largely geometric or aesthetic solution to the vexed question of the ideal relationship between the body and architecture. Christopher Alexander (1959) proposed an alternative, mathematically derived, analysis of ideal and practical dimensions to suggest a desirable range of perceptible dimensions. Alexander's work is important because it extends a largely symbolic treatment of body-environment relations that had dominated architecture since the Renaissance, to begin to embrace more psychological issues. However, it wasn't until the 1960s that Christian Norberg-Schulz linked the philosophical tradition of phenomenology to architectural theory, asserting that humans perceive their environment only to such a degree as it appears as a structured whole, not as random sequences of individual views. This implies that people tend to extrapolate implied spatial relationships to construct a personal functional order. In later publications, Norberg-Schulz (1985) developed this idea to describe the "spirit of a place" as being a result of accepting a site's natural resources and of being in harmony with climate and traditional building patterns.

Since Norberg-Schulz's original development of an architectural phenomenology, various scholars have expanded his ideas. For instance, David Leatherbarrow (2009) argues for the existence of a set of fundamental principles of form, space and materiality which, he suggests, are shown in the designs of Reima and Raili Pietilä, Steven Holl and Peter Zumthor. Leatherbarrow analysed not only the way in which architecture appears, but also how it is perceived and shaped by topography. According to Leatherbarrow and Mohsen (1993), materials, light, sound and temperature are the "language of architecture" which, while often unconsciously experienced, influence the observer's perception of space.

It is against this humanist, philosophical backdrop–of phenomenology and Cartesian rationalism–that prospect and refuge theory is positioned. This is not to say that it possesses the same motivation or conceptual agenda, rather that it posits a similar causal relationship between environmental stimuli and bodily reactions. Moreover, while architectural phenomenology is dominated by poetic or transcendent aspirations, prospect-refuge theory actually evokes a more primal condition associated with safety or survival, not spirituality. Nevertheless, despite these primitive origins, more recent architectural references to prospect-refuge theory have shown a tendency to conflate a sense of being safe, with a sense of being fulfilled, blurring the original distinction between base psychological needs and higher, neo-platonic aspirations (Unwin 2010).

Origins of Prospect and Refuge Theory

From 1975 to 1995, British geographer, poet and academic Jay Appleton produced several publications of which *The Experience of Landscape* (1975) is probably the most well-known. In this work he examines the questions, "what we like about landscapes and why do we like it?" (1). In answer to these questions he posits a theory of prospect and refuge, the origins of

which he traces to Darwinian notions of the "survival of the fittest" (Darwin 1958). Appleton also refers to John Dewey who states in his publication *Art as Experience* (1934) that "the nature of experience is determined by the essential conditions of life" (4, 13). Appleton argues that not only are human survival instincts important, but humans gain pleasure through doing all the things which are necessary for survival.

Appleton borrows ethologist Konrad Lorenz's (1964) phrase, "to see without being seen" (181) to identify elements in an environment which satisfy the biological need for survival by offering an opportunity to observe or to hide. Appleton's first proposition, called "habitat theory", relates pleasure to environmental conditions that are favourable to biological survival including "the ability of a place to satisfy *all* our biological needs" (1975, 70). Appleton's second proposition, "prospect-refuge theory", proposed the strategic appraisal of various landscapes as potential habitats that enable "the ability to see without being seen" (73); a property which is an "immediate source of aesthetic satisfaction" (73). Appleton's theory of landscape aesthetics is based on experience, behaviour and strategic relationships, rather than on form, order or pattern. Appleton argues that humans evaluate environments functionally, searching for the strategic opportunities they may provide. He develops this position to propose that prospect and refuge are important strategic concepts and thus they also shape our sense of environmental aesthetics.

According to Appleton, what influences the human perception of a landscape are the spatial arrangement of various components that support seeing and hiding, the opportunity for movement and exploration as well as the impact of shadow and sun. To this set of conditions he adds the category "hazards", which refers to real or imagined dangers or risks that have an impact on environmental preferences. A perceived risk that is observed from a secure position, might be tempting and exciting, just as the capacity to hide in an enclosed, dark space while there might be danger nearby could be regarded as a pleasurable experience. To the spatial arrangement, Appleton adds the factor "scale" as a criterion to distinguish behavioural from aesthetic experience. Prospect, refuge or hazard symbols limited by scale influence the behavioural experience by encouraging the body "to misjudge distance, to overestimate the size of a hiding-place" (117) while, for the aesthetic, symbolic equivalent experience of landscape, "when clouds become our sheltering canopy and the low streak of clear sky [becomes] our means of peeping out from under it, it would […] be […] absurd to peg the scale of intervening distances at the level at which they were originally effective" (117). Appleton argues that an equal proportion of prospect, refuge and hazard symbols may establish "balance" (121) in a landscape. However, the effectiveness of the symbols depends on the way in which each individual interprets them. Appleton proposed that prospect-refuge theory could be used in a variety of disciplines (including art, architecture, landscape design, photography and literature) to analyse aesthetic preferences for environments. He considers that architecture is a "field in which the concepts of 'order', 'symmetry' [and] 'proportion' [… give] us an understanding of the basis on which to distinguish between the beautiful and the ugly" (195). However, he explains that a planned environment does not necessarily need to be aesthetically more satisfying than an irregular, natural one.

Appleton not only describes a general theory connecting prospect, refuge and hazard, but he also divides each of these three factors into various sub-categories, offering a breakdown of their potential relationship. For example, he distinguishes between "direct prospects" (all views directly observed from a given view point) and "indirect prospects" (restricted views) (Table 1). All direct prospects observed by an individual are called primary vantage-points. Secondary vantage-points suggest the expectation of an indirect prospect (Table 2). Just as he has divided prospect into several sub-categories, so too Appleton distinguishes refuge symbols by "function", by "origin", by "substance" and he adds "accessibility" and "efficiency" as two further groups (Table 3). Finally, Appleton identifies three main types of psychological threats: "incident hazards", "impediment hazards" and "deficiency hazards" (Table 4).

Table 1: Appleton–Types of Prospects

Category	Direct prospects					Indirect prospects			
Sub-category	panoramas (open or closed)		vistas (open or closed)			secondary panoramas	secondary vistas		secondary peepholes
Type	simple	interrupted	simple	horizontal	peepholes		deflected vistas	offsets	
Notes	360`	minor obstacles	Some Intervening screen	wide but vertically re-stricted view	restrictions to both planes				

Table 2: Appleton–Types of Vantage-Points

Category	Primary vantage-points (commanding, direct prospect)	Secondary vantage-points (commanding, in the imagination, indirect prospects)		
Sub-category		natural	artificial	composite
Notes/ Examples		hills, mountains	man-made structures as observation point	

Table 3: Appleton–Types of Refuge

Category	by function			by origin			by substance		
Sub-category	hides	shelters	composite	natural	artificial	composite	earth refuges	vegetation refuges	nebulous refuges
Notes/ Examples					buildings, ships, others		caves, rocks hollows	arboreal, trees, hedges, reeds	mist, smoke

Table 4: Appleton–Types of Hazards

Category	Incident hazards		Impediment hazards		Deficiency hazards
Sub-category	animate	inanimate	natural	artificial	natural
Examples	human or non-human	fire, water, instability	dense vegetation, cliffs	hedges or fences	hunger and thirst

While the division of the three main categories–prospect, refuge and hazard–into various sub-sets suggests a degree of gradation to the theory, no explanation for how these sub-sets may be used, or what they mean in combination, has ever been offered. Furthermore, while Appleton offers some examples to illustrate his various sub-set categories, many of the combinations seem unlikely or repetitive suggesting that the set of possible options is not so extensive as it first seems and is perhaps less useful as well. For example, in landscape analysis the classic prospect-refuge case is a cave, with one entrance that overlooks a steep gorge with a stream running down it; a situation with enclosure, outlook and danger. Depending on the degree of correlation between the view of the gorge and the direction of the cave mouth, the prospect may be either “direct” or “indirect”, but it is likely to be “closed” and framed like a “peephole”

(Table 1). In terms of refuge, it is definitely defined by the material properties of "earth" and it is of "natural" origins and it functions as a "shelter" (Table 3). The hazard is simultaneously an "incident" and an "impediment" danger, the former being "inanimate" and the second "natural" (Table 4). If there was a detailed survey plan, with photographic documentation of the particular cave that is being considered, it might be possible to narrow a few of the prospect categories including vantage point differentiation, but it is unclear what purpose this would serve. In the present context, which is focused on potential definitions, the categories are of interest, even if their application remains less clear. However, ten years after the publication of *The Experience of Landscape,* when Appleton revisited prospect-refuge theory, he describes it as an "exploratory tool" (1984, 100) which enables individuals to see the significance of a landscape component in relation to all others. If the purpose of the various categories and subsets is largely to assist in exploration, then this may be useful, but for deeper analytical purposes their application remains less apparent.

Prospect and Refuge Theory in Landscape and Urban Design

At around the same time Appleton was developing prospect-refuge theory from studies of habitat preference, multiple other researchers were exploring similar ideas. Many of these researchers explicitly refer to prospect-refuge theory although not all agree with Appleton and several have expanded or revised his original idea or proposed alternative, similar theories. There are also several instances where theories strikingly similar to Appleton's were proposed prior to the publication of *The Experience of Landscape.* For example, Adrian Stokes (1947; 1965) theory of "enclosure and envelopment", while inspired by a different body of thought, has strong resonances with Appleton's work. Kite (2008) claims that Appleton arrived at his theory "from the angle of evolutionary biology" (203) while Stokes drew from "deep reflection on the nature of spatial experience and […] the discourse of psychoanalysis" (203). The works discussed in this section are typically concerned with testing preference for particular landscape or urban environment. All of these works explicitly refer to prospect-refuge theory, typically stressing different dimensions of it or adding additional factors or qualifiers. This section is not concerned with whether the works being considered agree with the theory, or the results of their isolated tests, rather it is focused on the way they define the theory.

The work of Rachel and Stephen Kaplan, both researchers in environmental psychology, has influenced a range of landscape and design professionals. Over a twenty-year period, the early stages of which coincided with the publication of Appleton's work, the Kaplans developed a framework for the prediction of environmental preference (Kaplan 1975, 1987; Kaplan and Kaplan 1982a, 1982b, 1989). The Kaplans' (1983) exploration of habitat preference is, like Appleton's, a response to the combination of human needs and environmental conditions. In this work, they propose that a key factor influencing preference is "mystery". Prior to that, Stephen Kaplan (1982) used measures of affective reaction (pleasure and pain) and interest (like or dislike) as criterion to analyse landscape preference. Rachel Kaplan and Eugene J. Herbert (1988) later expanded their ideas testing landscape preferences in a cross-cultural context.

Caroline M. Hagerhall (2000) applied the Kaplan's framework for prediction of preference, alongside Appleton's prospect-refuge theory, to analyse Swedish landscapes. In her work she investigates an alternative way of identifying a connection between preference and predictors that does not rely on expert judgments or initial categorization: two common approaches in environmental psychology. Hagerhall's criteria include implied capacity for preference, exploration, safety and overview which are related to aesthetic preference and refer to predictors such as prospect, refuge and mystery. Further criteria she uses in the questionnaire cover management (is this environment well-managed?), agrarianism (would you call this pasture?), progenitors (does this environment have a clear and apparent history or historic connection?) and physical

age (has this environment been pasture land for a long time?) all of which are related to cultural heritage and to the evolutionary approach to aesthetics.

In 1983, Jack L. Nasar's team examined the affect of prospect and refuge on people's perception of a site. They created four different scenarios ("closed view" or "open view" from a "protected" or "unprotected" observation point). The three assessment factors they used are evaluation (like or dislike), internal arousal (excited or calm) and safety (safe or unsafe). Nasar (et al. 1983) expected individuals "to prefer more openness in a natural scene [and] more enclosure in the observation point" (Nasar et al. 356). However, these results only partially supported Appleton's theory. Five years later, Nasar (1988) argued that a successful design results from understanding both the visual environment and its human affect. The aesthetic quality of an environment influences the sense of being attracted to, or distracted to or repulsed by, certain spatial conditions which in turn have an impact on well-being. Nasar's (1988) conclusion was derived from a comparative analysis of visual preferences for urban environments between Western (United States) and Asian (Japan) cultures. Nasar assumed that relatively novel scenes would be preferred in comparison to relatively familiar scenes and that preference was expected to be relative to visual complexity. His expanded criteria for assessing prospect and refuge are: novelty, complexity, order, naturalness, openness, upkeep and prominence of vehicles. Each of these were rated as either pleasant or unpleasant, interesting or uninteresting, as differentiated by cultural background.

Ruddell and Hammitt (1987) examine Appleton's prospect refuge theory "as a psychological orientation for visual preference of outdoor recreationists for edge environments" (249). In their research, the following categories of themes are derived from prospect-refuge theory: "refuge symbolic (distant)", "refuge symbolic (immediate)", "refuge dominant", "rough, ill-defined" and "prospect dominant". They distinguish three categories for refuge which suggest a reachable place to hide (distant refuge), a place nearby where a person would be concealed (immediate refuge), or a place where a person is hiding in the bush (refuge dominant). "Prospect dominant" conditions describe a broad view-point. Visual criteria for identifying edge environment themes are the "degree of distinct edge", "viewer position relative to the edge", "degree of prospect", "degree of refuge" and "degree of refuge symbolism".

Stamps III's (2008a, 2008b) research into environmental preference is drawn from a series of studies of the following four factors: "prospect (depth of view), refuge (presence of protective regions in front of the observer or […] possibilities of escape), direction of light (either front or back lighting), and venue (natural or built environment)" (147). Stamps III uses two scales, "comfort" and "liking", to differentiate various spatial responses. Comfort is a substitute for perceived safety or danger and liking refers to those results chosen for purely aesthetic reasons. In a similar way, Loewen, Steel and Suedfeld (1993) analyse specific urban environments in relation to the degree to which people feel safe from crime. They examine the interaction between prospect, refuge and gender on perceptions of safety. Environmental characteristics such as light, open space and access to an "unambiguous refuge" (323), by which they mean a space that has the potential for supporting human assistance if needed, are the indicators of safety. Mumcu, Düzenli and Özbilen (2010) also attempt to identify criteria for the evaluation of spatial features of successful seating areas in urban open spaces. The qualities they seek to study include prospect and refuge along with consideration of most attractive, most preferred, non-preferred, comfortable and safe scenes.

Prospect-refuge Theory in Architecture

Grant Hildebrand, professor emeritus of architecture and art history at the University of Washington, wrote several books in architecture before he became interested in prospect-refuge theory. In 1991, he published *The Wright Space: pattern and meaning in Frank Lloyd Wright's houses* and in 1999 he expanded the theoretical foundations of that work to propose a general

aesthetic theory in *Origins of Architectural Pleasure*. In *The Wright Space* Hilde- brand (1991) analyses spatial characteristics of thirty-three of Frank Lloyds Wright's houses and identifies a repetitive use of key elements–including combinations of ceiling heights and openings between interior and exterior spaces–which he categorises as prospect and refuge factors. To these basic spatial relations, Hildebrand adds what he calls "complexity and order" to describe the unique quality of Wright's domestic architecture which makes it so valued by clients and designers. According to Hildebrand, Wright arranged certain elements in a repetitive way which he calls "Wright's pattern" (19). Usually, there is an open plan living area with a fireplace at the centre of the house. There will be windows on the wall opposite the fireplace and an opening which leads to a large terrace (which acts as an extension of the living space) which functions as an observation platform. Throughout his life, Wright changed some attributes of this configuration including, on the exterior he added deep overhanging eaves and additional terraces while the interior became more complex by adding openings to, and interior views through, adjacent spaces. In Wright's houses the living area will typically sit directly under the rising roof or, if on a lower level, become a two-story space with the central fire place having a lower ceiling height; a spatial configuration what allegedly adds significantly to the sense of refuge and prospect. In total, Hildebrand identifies thirteen characteristics of the pattern which he observes can all be found together, for the first time, in Wright's Arthur Heurtley House which was completed in 1902.

> The major spaces are elevated well above the terrain they overlook. The fireplace is withdrawn to the heart of the house [...] emphasised by a low ceiling edge and flanking built-in seating and cabinetwork. The ceiling forward of the fireplace zone sweeps upward into the roof [...]. There are interior views to contiguous spaces seen beyond architectural devices. Glass and glazed doors are located on walls distant from the fire. A generous elevated terrace lies beyond. The exterior consists of deep overhanging eaves, an evident central chimney, broad horizontal groupings of window bands, and conspicuous balconies or terraces. The connection from exterior to interior is by means of a long and circuitous path. (25)

Of the set of thirteen characteristics of the pattern (Table 5) Hildebrand acknowledges that Wright did not use all characteristics in all of his houses, but most of his major houses have at least ten of these elements. He also considers that Wright himself was not aware about the pattern and that most architectural critics were also not aware of its significance. As an example, Hildebrand refers to Norberg-Schulz's (1980) proposition that Wright "destroyed the traditional 'box' and created a new interaction between inside and outside" (194). Norberg-Schulz (1985) also said that Wright "created an inner world of protection and comfort" (99).

Table 5: Hildebrand–Wright's Pattern

Characteristics	Prospect	Refuge	Complexity
major spaces elevated	yes	-	-
withdrawn fireplace	-	yes	-
low ceiling	-	yes	-
built-in seating and cabinetwork	-	yes	-
ceiling sweeping upwards into roof	yes	-	-
interior views to contiguous spaces	yes	-	yes
glass and glazed door	yes	-	-
generous elevated terrace	yes	-	-
deep overhanging eaves	yes	yes	-
evident central chimney	-	yes	-
horizontal window bands	yes	-	-
conspic u ous balconies or terraces	yes	-	-
connection of exterior to interior/circuitous path	yes	-	yes

Table 6: Hildebrand–Characteristics

Category	Prospect and refuge		Complexity and order		Enticement	Peril
Relationship	mutually complementary		coexistent (depends on individual)			
Attribute	expansive, bright	small, dark	high level	high degree	desire to explore	handling danger
Symbolism	intrinsic pleasure when observing	hiding, safety	overwhelming; movement allows choice	pleasure	view (light) and opportunity for movement	source of pleasure
Meaning	fundamental to habitable space		key to aesthetic approach		fundamental to habitable space	

For Hildebrand, prospect-refuge theory suggests that there is an intrinsic pleasure in the act of observing from a safe place. He then defines the following spatial characteristics as being central to the pleasure: "complexity and order, prospect and refuge, hazard, and mystery" (1991, 29). He describes the first two pairs, complexity and order and prospect and refuge, as mutually complementary, but an increase in complexity does not necessarily mean a decrease in order, and also an increase in prospect does not require a decrease in refuge. Hildebrand states that an environment which is rated as very high in aesthetic quality usually is related to high levels of complexity and order (Table 6).

In *Origins of Architectural Pleasure* (1999), Hildebrand further explores why some buildings elicit happiness of excitement arguing that these reactions occur when architectural and natural elements are combined in complex but organised environments. Hildebrand explains that "[r]efuge and prospect are opposites: refuge is small and dark; prospect is expansive and bright" (22), however, they are interrelated and both are needed together. Thus, refuge and prospect in an interior depends on a combination of spatial dimensions, light quantity and view. According to Hildebrand, a low ceiling plane is the most important dimension for creating a sense of

containment (interior refuge). Interior prospect, on the other hand, depends on "generous plan dimensions, a significantly raised ceiling plane, significantly increased light levels, and generous expanses of transparent surface" (1999, 32). Spaces which are opened to each other provide interior prospect. Furthermore, Hildebrand explains that when we move "from darker to lighter, we will again be able to see without being seen, and so will ensure for ourselves relative safety during exploration" (54). The desire to explore is called "enticement". According to Hildebrand, enticement is both,

> a view and [an] opportunity for movement [: …] the occupied space being relatively darker and the partly revealed space relatively brighter. Enticement is like refuge and prospect in deploying light in a way that suggests safety, but it differs in concealing significant elements of what lies ahead. (55)

"Enticement" and "peril" are other important characteristics Hildebrand uses to expand the base definition of prospect and refuge. According to him, handling danger by experiencing it is a source of pleasure. Both enticement and peril demand a dramatic site or a generous interior volume. "Complexity and order" are further important factors Hildebrand uses to differentiate spaces by aesthetic experience. He states that a high degree in order is associated with pleasure and that the degree of complexity and order depends on the individual's perception. Some of Frank Lloyd Wright's houses may appear overloaded with detail this detail has very high levels of ordered or controlled complexity. However, movement through the space allows a choice of degrees of prospect and refuge so the architecture can suit the inhabitant's mood. Hildebrand sees the Palmer House as a good example of this capacity in Wright's pattern.

Hildebrand's development of prospect-refuge uses the following six factors to evaluate individual preferences: "the necessarily complementary [1] prospect and [2] refuge; the more or less autonomous [3] enticement and [4] peril; and the necessarily coexistent [5] order and [6] complexity" (144). All of these characteristics have an impact on the composition of architectural space. Hildebrand (1999) maintains that refuge and prospect spatial conditions are "keys to our appropriate habitation" (145) and concludes that "human pleasure is a legitimate architectural purpose" (148).

Prospect-refuge Theory in Interior Design

While Hildebrand's development of a series of constructed spatial patterns to support prospect and refuge theory includes both interior and exterior elements, there have since been additional proposals which have been largely focused on interior design. For example, academic Suzanne C. Scott (1993b) examines the relevance of "complexity" and "mystery" as predictors of preference for designed interiors. Her study was intended to provide direction for designers so that they could manipulate "complexity" and "mystery" within interior environments and thereby create more desirable spaces. For her study, "complexity" was defined as "diversity, richness, or intricacy of the overall scene"; "mystery" was defined as "the degree to which a scene suggests the opportunity to venture further and learn more" (27). In a separate study Scott (1993a) investigated relationships between environmental attributes and preference to relate aesthetic quality to physical well-being and particularly in situations where there is exposure to natural environments. Scott's study is based on "conceptual frameworks linking aesthetic evaluation to cognitive processes and common human needs for information" (7). The principal components of her analysis were named after common design attributes and were grouped by expert judges. The factors included geometric shape, spaciousness (size, degree of enclosure and density of interior forms), directional emphasis, spatial organisation, complexity of visual field (number and variety of elements), surface texture and pattern, surface value and lighting composition and type (9).

Franz, Heyde and Bülthoff (2004) present an empirical approach to the experience of interior space based on a combination of virtual reality simulations and a description of spatial properties. Isovists and visible graph analysis are used to identify parameters that are most suitable for generally predicting experiential qualities like prospect and refuge. Thirty-three characteristic values derived from the isovists were used to test the experiential qualities of spatial situations in a hypothetical art gallery. The rating categories were based on affective experience (pleasure, beauty) as well as spatial qualities (spaciousness, openness, clarity, complexity).

In the last of the interior design examples, Stamps III (2006) conducted two studies describing how well the concepts of "prospect", "refuge" and "comfort" work for interiors, in relation to various formal and spatial variations including horizontal size, height and light. Stamps III's definition of prospect-refuge, unlike the other three interior studies described in this section, largely drew on Appleton's original description.

Discussion and Conclusion

What then are the most common terms to describe the different facets or dimensions of the theory of prospect and refuge? If a simple qualitative review of word usage in each of the variations discussed in this chapter is undertaken, it is possible to identify which words or concepts are considered central to the theory by the majority of researchers. Table 7 lists the relative frequency (very common, common, rare) of words used in these separate formulations of the theory, along with the broad theme in the theory which they address (divided by prospect, refuge, hazard and other). It is important to remember that this process counts each definition in the same way, so while Appleton's ideas dominate the early thinking on prospect and refuge, his definition is accorded the same weighting as any other scholar who offers a variation. The goal of this process is not to identify a correct or perfect definition, but rather to seek an accepted or inclusive one to use as a starting point for a future testing, and possible revision, of that definition.

Table 7: Frequency of Words Used to Define Prospect-refuge Theory

Incidence	Prospect	Refuge	Hazard	Other
Very common	prospect	refuge	-	-
Common	safety	safety	-	complexity, preference, light, comfort, mystery
Rare	direct or indirect prospect, interior prospect, open view, closed view, overview, openness, prospect dominant ,	interior refuge, protected or unprotected observation point, access to help, refuge symbolic, immediate refuge, refuge dominant	hazard , peril	naturalism, order, spaciousness, spatial organisation, clarity, enticement, exploration, excitement, novelty, venue

By virtue of only choosing research that explicitly refers to prospect-refuge theory, these two words–prospect and refuge–are ubiquitous, but thereafter, several different properties of the various definitions emerge. For example, safety is commonly used to define both prospect and refuge: a value which underpins a large proportion of the theory. However, in the common category, a wide range of other concepts also recur. In order of their relative frequency in this category, these words include complexity, preference, light, comfort and mystery. That these "other" categories are so extensive immediately suggests that scholars have been drawn to add to prospect and refuge theory to make it workable in their different fields. Moreover, several of these, including complexity and mystery and possibly also preference, relate to a sense of

spatial richness and diversity. A quality that may relate to choice (multiple paths), discovery (the route through which the prospect is unveiled) or visual depth.

In the rare category, a large number of additional qualifiers or adjectives are used to describe the theory. Some of these words include organisation, novelty and access. However, possibly the most interesting pair of words in the rare set are hazard and peril. Given the apparent importance of the existence of a form of danger as a prerequisite for the theory, these words are rarely used. Instead, the more positively framed word, safety is typically stressed, and hazards are, with the exception of in Appleton's work, rarely described or differentiated.

What then are the elements of an inclusive definition of prospect-refuge theory? They include, in priority order, the following four features:

1. An outlook, vista or view; the prospect around which the remainder of the theory revolves. There are many ways of differentiating types of view or outlook but without this feature the conditions that enable the theory do not exist.
2. A setting, context of frame; the refuge, which contains or houses the viewer or person experiencing the prospect. It is only by providing such a frame to the view that the theory can work. Indeed, a large amount of the discussion underpinning the theory is concerned with the right balance, or pattern of relationship, between frame and view.
3. A sense, either real, implied, imagined or symbolic, that safety is required. The sense of comfort provided by the right balance of view and frame operates to provide psychological comfort only because the particular combination serves to provide a sense of safety, or militate against potential hazards.
4. A degree of visual and experiential richness and complexity. There is little agreement on where precisely this quality must reside, but there is a widespread sense that it is part of the larger, prospect-refuge equation. For example, some argue that the approach path taken to the refuge site, must entail a sense of discovery or conversely a sense of separation or hiding. However, others argue that the mystery should be implied in the relationship between the view and frame, insisting that lateral or indirect views evoke this property most strongly.

Prospect-refuge theory could therefore be described in general terms as *a particular environmental pattern, made up of spatial and formal relations that educe feelings of safety and well-being*. The environmental pattern is achieved through a careful balance between vista and frame that also evokes a sense of the unknown.

This theory suggests that humans seek out environments which make them feel secure. It also suggests that the aesthetic experience and pleasure which a person derives from observing and exploring an environment is reliant on a particular combination of openness and enclosure. The theory proposes that a balanced arrangement of prospect and refuge in an environment will achieve this affect.

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