Chapter 3

Literature Review

3.1 INTRODUCTION

There are occasions when we cannot depend upon knowledge we already possess. Sometimes comes up, and we must seek out new information in order to know what to do. Say, for instance, we decide to go to Paris. Most likely we would need information on times to go, airfares and connections, where to stay, exchange rates, places to see in Paris, and so on. Where would we go to find this information? Nowadays, we would probably turn to the Internet or visit the travel section at the bookstore. We can talk to a travel agent. We might watch a film on Paris, maybe something associated with the city: its art, its parks, its cuisine. This is all research of a kind. What is more, it is a "literature review," a survey of various sources. But a trip to Paris comes and goes. The information we found to make our trip possible tends not to have applicability beyond the single event of our trip, although we can give anecdotal advice to others when they decide to go in the future.

The information gathering this book addresses is of a kind aimed to produce knowledge that is more lasting and has more widespread usefulness. Because of this quest for widely useful knowledge, the literature review is a very important part of the research process. It is essential not only at the beginning of the process, but throughout it.

The information coming out of research should have the following attributes:

1. The information should address a specific topic of inquiry. By specific, we mean that the topic can usually be summarized in several sentences, or at most a concise paragraph or two. (The abstract of a research paper usually fulfills this role,
although the core focus of a research project can often be even more condensed than the wording of a formal abstract.)

2. The research result on this topic of inquiry ought to find its place in a larger domain of relevant literature, or at least be deemed qualified to do so by a representative community of informed people. In other words, the research results should constitute a contribution to (an addition to, an expansion of, a deepening of) a larger body of information related to the topic of inquiry.

3. When completed, the research result should be able to stand on its own for the use of others, independent of the researcher who initially formulated it.

The literature review plays an important role in achieving these goals, where there is always a certain cyclical process at play: A researcher must be informed about the existing literature his or her research needs to draw from, because the outcome of the research will expand that body of literature. The next researcher in this topical area will take from the (now expanded) literature and make further contributions to it, and so on.

3.1.1 Literature Review as an Exploratory System

We define "the literature" as a body of information, existing in a wide variety of stored formats, that has conceptual relevance for a particular topic of inquiry. A literature review, then, is the totality of activities the researcher undertakes to use that body of information in such a way that a topic of inquiry can be competently defined and addressed. Thus, a literature review is not synonymous with a "general" sense of what exists in the literature of a field. A literature review exists only after the general material has been arranged into a coherent system, one that has been customized to fit the research question. Such a system can be in the researcher's mind; it will be more useful if put in some kind of written or diagrammatic form (which expands or changes as the research progresses). Chris Hart lists various issues that a systematic exploration of the literature should address, among them:

1. What are the key sources?
2. What are the key theories?
3. What are the major issues and debates about this topic?
4. What are the epistemological and ontological grounds for the discipline?
5. What are the main questions and problems that have been addressed to date?

Embedded in these questions is the search for a response to the literature, the generation of a topic of inquiry that will be recognizable by all informed persons as a legitimate and original approach to the subject at hand. "The literature" therefore has fluid boundaries; its scope depends upon the topic of inquiry. Formulating the topic in such a way as to determine the initial scope of the literature is one of the first creative steps a researcher takes.

3.1.2 Annotated Bibliography versus Literature Review

A literature review is often confused with an annotated bibliography. An annotated bibliography is an intermediate point toward the literature review. By means of a listing of references obtained from searching a field's literature (or more commonly the literature of several fields), a researcher begins to amass a body of information that shapes the investigation. The aim of an annotated bibliography is to respond to each reference cited with a descriptive paragraph of the work's goals, its theoretical stance, and most importantly, its relevance for the investigation. This process helps focus the emerging research question.

From the annotated bibliography, the literature review proper can then be produced. This is more than an itemized list of existing references; it is rather a narrative document, making use of the references in the annotated bibliography, but going beyond it to include the following information:

1. An introductory statement of the general intent of the literature exploration. This includes suggestions for the ultimate direction of the proposed research to come.
2. A summary of the lines of existing research that provide background for the proposed research; this usually involves grouping the annotated items into larger common themes (see Section 3.2).
3. Observations on the state of the literature in terms of how it can be expanded by the proposed research. In other words, the reviewer needs to identify specific areas that have not been covered by the extant literature, arguments that he or she wishes to challenge, or subjects of study that can be reconfigured by a new conceptual framework.

3.1.3 Diagrammatic Structure for a Research Study

To situate literature review in relation to the overall research process, we offer the diagram in Figure 3.1. The researcher looks in two directions. On one hand there is the question being pursued; on the other there is the audience that must ultimately receive the research results. The research question is accessed by means of research strategies and tactics. The strategy/tactic distinction is elaborated in the previous chapters, and is the format for the seven chapters in Part II. We depict two bodies of literature because usually at least two are consulted in the course of a research project; often there are many more. One of the bodies of literature is often emphasized more than the other, and the results will most probably contribute to that realm. The arrows drawn from the literature to the various junctures of the research process indicate literature review; it is evident that literature review contributes to every aspect of the process. Additionally, the research result relates to the literature by expanding it. Indeed, the success of the research depends upon whether the audience deems it worthy as an expansion of the literature. Finally, the process is a dynamic one. The relationship between the topic of inquiry, the actions taken to access it, and the
researcher's own thinking is an ever-changing reality; the literature review is thus an ongoing activity. It is wrong to limit "lit review" to the beginning of the research process only and to assume that after 20 or 30 titles have been listed, that part of the process is complete. This is simply insufficient.

In keeping with the framework of the chapters in Part II, this chapter considers literature review with a strategy-tactic approach as well. We do not suggest by this that literature review is one kind of research strategy on par with the seven we cover in Part II. Literature review is necessary for any research strategy. Here, we merely follow the strategy-tactic format as a means of organizing our material. Section 3.2 addresses the uses of literature review. Section 3.3 addresses some general tactical considerations for the use of literature review, and Section 3.4 addresses available resources. But before proceeding with the uses of literature review, we first consider some differences between fact-finding for design and fact-finding for research.

3.1.4 Literature Review for Designers and for Researchers

The audience of this book includes designers as well as researchers, two groups that often have different needs. Yet if literature review is understood as fact-finding as such, then it is certainly practiced by both. The chart in Figure 3.2 offers some comparisons between design and research that have a strong bearing on the ways designers and researchers make use of literature review.

<table>
<thead>
<tr>
<th>Design Inquiry</th>
<th>Research Inquiry</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aim</strong></td>
<td>Usually culminates in an empirical object located in a particular place and time</td>
</tr>
<tr>
<td><strong>Use of literature review</strong></td>
<td>Usually culminates in an explanatory conceptual system with use beyond the confines of one place and time</td>
</tr>
<tr>
<td>To develop case-specific programmatic information</td>
<td>To identify and connect topic of inquiry to disciplinary sources</td>
</tr>
<tr>
<td>To gain familiarity with typological precedents</td>
<td>To ground the project in the proper theoretical / philosophical / epistemological starting points</td>
</tr>
<tr>
<td>To garner facts for normative action</td>
<td>To respond to, or in some other way contribute to, the state of knowledge on the subject</td>
</tr>
<tr>
<td>To focus methodological approaches</td>
<td>To focus methodological approaches</td>
</tr>
</tbody>
</table>

![Figure 3.2](image-url) 

Figure 3.2 Similarities and differences in literature review between design inquiry and research inquiry.

While the wording in Figure 3.2 probably does not accommodate all possible cases of design or research, it offers some serviceable oppositions. The design task culminates in a built form, while the research task usually results in a written text. Unlike the former, the latter is not yoked to a particular place or time; rather, it is usually applicable regardless of locale. Also, the design task seeks information that applies to a specific case, sometimes with reference to precedents, and always for the purpose of
taking normative design actions. The design task is thus more loosely tied to the literature initially consulted. The very physical presence of designed objects calls for evaluative criteria rooted in the objects themselves (e.g., functional criteria, client satisfaction, approval of the community, and so on). Whether or not the literature referenced plays a key role in that evaluation is usually a contingent matter. This is not so with research outcomes. Not only must they be affirmed or denied by subsequent tests at times, they must also meet the logical and qualitative demands of the literature they aim to expand. Here, for instance, are some comments on a well-known example of research, Kevin Lynch's *The Image of the City*: these comments can be found on the back cover of the 27th edition of Lynch's book (MIT Press, 2006):

City planners and urban designers everywhere will be taking account of his work for years to come. . . . The importance of this book in the literature of urbanism is obvious. (Leonard K. Eaton, *Progressive Architecture*)

This small and readable book makes one of the most important modern contributions to large-scale design theory. (David A. Crane, *Journal of the American Institute of Planners*)

It is clear from these comments that Lynch’s work is considered valuable insofar as it is deemed a contribution to a literature. Because it is research, rather than design, that demands a more systematic engagement with “the literature,” our observations below are largely given with that domain in view.

3.2 USES OF LITERATURE REVIEW

A large part of the education of researchers involves gaining familiarity with the literature of their fields. This is the reason why masters and doctoral programs in almost all disciplines require a period of coursework before the thesis research is undertaken. The coursework aims not only to expose the student to the extant literature, it also aims to cultivate the ability to interact with it. Research questions emerge out of such interaction. This section addresses ways a working familiarity with the literature can be used.

3.2.1 Using Literature Review to Identify the Research Question

The literature can be “mined” in active ways to identify topics of inquiry; here we list some of those ways. Our list is not comprehensive, but hopefully it is of sufficient variety to stir the mind toward additional possibilities.

First, topics of inquiry can emerge from analyzing, critiquing, and suggesting improvements to an extant work. Consider again Lynch’s *The Image of the City*. Lynch limits his study to American cities, but his analytical categories of city image (paths, edges, districts, nodes, landmarks), with their implicitly universal scope, raise the question of whether or not they apply to non-Western cities as well. Would they apply, for instance, to a Bombay or a Shangai? Lynch’s lack of analysis of non-Western cities opens room for further work. As to methodology, Lynch himself criticizes his method of interview. The groups he interviewed were so small that their city “images” may not have been truly representative. Certainly a theory with such widespread acclaim ought to be re-examined with a larger sample; this is one example where a critique of existing literature can lead to new ideas for research.

Second, research questions can emerge from a comparison of representative works in the literature. Why does Laugier’s *Essay on Architecture* (1751) posit one origin for the built form—the hut—but Quatremere de Quincy’s theory of origins (1800) posits three separate origins: hut, cave, tent? What happened in those 50 years to alter the theoretical emphasis from one to three? In a slightly different twist, Michael O’Neill, in a paper on computer simulation of human way-finding, compares an extant theory in the literature (the computational process model) with a new one he proposes (the biological model). Comparison, the exploration of the implications of two related but different realities, offers fertile ground for new topics of inquiry.

Third, a topic of inquiry can emerge when an existing theory is used to test a related theme. Take Stewart Brand’s *How Buildings Learn*, a work that theorizes why the physical attributes of buildings never stay the same, but change due to a variety of factors, among these economics, technology, and fashion. In a current master’s thesis under one of the authors’ direction, a student is taking Brand’s theory of building change and applying it to the scale of a large city block over 100 years of its history. Do Brand’s six indicators of change (site, structure, skin, services, space plan, stuff—see Figure 11.8) have the same explanatory relevance at the level of a city block? Can they be attributed to the same factors, or do other factors come into play on a larger scale?

Fourth, extant theories in the literature can always be tested. An instance of this can be found in the work of Stephen Kaplan, et al., who tested Christopher Alexander’s claims that certain patterned arrangements in physical environments conduc positive subjective responses in people. For his part, Alexander says of a given pattern: “we have a general sense that something is ‘right’ there; something is working; something feels good.” Kaplan took one of Alexander’s patterns, the window, and tested this claim, producing qualified results. One can see how the addition of Kaplan’s work to a literature that already contains Alexander’s *Timeless Way of Building* deepens the body of knowledge in this area.

Fifth, a topic of inquiry can attempt expansions of an existing concept or theory. Take for instance Christian Norberg-Schulz’s work in applying Heidegger’s phenomenology to the experience of built environments, specifically, to an explanation of “spirit of place” (*genus loci*). Norberg-Schulz’s work made two substantial contributions to the literature in architectural theory. First, his “phenomenology” became an explicit way of critiquing the modernist movement in architecture. More importantly,
Norberg-Schulz's ideas on "spirit of place" and "dwelling" have become a kind of primary source for both architects and architectural theorists in their explorations of subjective identities with physical locales.

There are many more possible ways for "mining" the literature to develop a research question. They all involve imagination and creativity, which can be characterized as an ability to seek new thematic connections. Research creativity is the ability to derive new implications from existing positions, critique past stances from an awareness of present positions, or even project future conditions based upon learned premises. This creativity is of course not equal in all people. But it certainly can be cultivated, and that cultivation starts with gaining familiarity with the existing literature, and then gaining dexterity in reacting to it.

One example of the creative imagination working in conjunction with a knowledge of the literature may be seen in Clare Cooper Marcus's own account of how she came upon the methodology for researching subjective experiences of identity with home. She recounts how early in her career she had been frustrated by extant approaches to this topic. It was not until a friend of hers "talked to the desert" that she discovered a way by which precognitive realities of the "house-self dynamic" could be unearthed. She then embarked on a method that involved asking a subject to talk to the house, and then to have the house "talk" back to her, supplemented by attempts to capture the feelings in graphic form. The point for us is that while Clare Cooper Marcus found the literature in her field lacking, it formed the basis by which her imagination was able to identify something new when the opportunity presented itself. The result is her book *House as Mirror of Self*.

### 3.2.2 Using Literature Review to Focus the Topic of Inquiry

A topic of inquiry should not be too general. Here is an overly general topical question: *How do built forms affect people?* This is akin to asking what is like to be an American. There are so many possible answers that a study based on it is likely to be amorphous. At the other extreme, a topic cannot be so restrictive that the answer will prove to have limited use. Consider this question: *How does Mary like this modernist building?* We may well find out how Mary responds, but this information is not useful in any widely applicable way; it pertains only to the affections of one person.

An indicator that a topic of inquiry may be either too broad or too restrictive is the inability to clearly and simply identify a body of literature to which the topical question can be referred. In the general case above, almost anything related to built form may be relevant. What is driving the question? Thermal considerations? Quality of life issues? Historical and/or cultural considerations? Aesthetics? Psychology? The question is too broad to furnish a direction. Box 3.1 illustrates the fact that, at the initial stages of identifying a topic of inquiry, the questions tend not only to be too broad, but as a consequence, to cover many different literatures. At the other extreme, how a limited sample (Mary) responds to a built form may not be addressed by

### BOX 3.1

**What Is the Right Question? A Case from a B.Arch. Design Project**

Julie Keen's B.Arch. thesis project is motivated by a concept she wishes to capture in material form. That concept is the "in-between." The project is a cultural center to be located on the grounds of a private Catholic university. In a review early in the design process, she presented her concept to the reviewers. However, she presented several possible definitions of "the in-between," and because she did not precisely define the term, other versions of what "in-between" can mean began to proliferate during the discussion.

1. In between the past and the present (we are forever in the NOW).
2. In between two cultures of the region.
3. In between the cultures of her own background (Julie's background is Asian and Western).
4. In between two physical objects (the actual site of the building).
5. In between earth and sky.

It is clear that many different literatures can be examined in her project, depending upon the precision of her question. Here is a sampling of the literatures possible for each item above:

1. Phenomenology: Heidegger, Gadamer, perhaps Blode and Bergson.
2. In this case: Northwest American Indian culture vs. general American culture.
5. Mystical literature/eastern writings and exemplars; Heidegger.

---

Figure 3.3 A student preliminary study of a structure somehow expressive of "in-between." Here an "elbow-shaped" form is placed on the site in-between some strategically formed topological conditions. Drawing courtesy of Julie Keen, Washington State University at Spokane. John Abell, instructor.
"a literature" at all. The single case is simply too localized to need any written material (which, again, is motivated by a need to share observations and results that are relevant in a broad sense). Now, consider a question that is somewhat intermediate between the two extremes: what is the length of stay of nursing home occupants in "homey" interior environments versus the length of stay in facilities with more "institutionalized" interior decor? This is a good beginning for a research question because it easily conjures up available literature. And one additional indicator of a good question is that it quickly conjures up certain methodological possibilities as well. For instance, in this case, we can immediately devise paths of action: defining "homey" and identifying sample environments; identifying "nonhomey" exemplars; surveying records; designing questionnaires; planning for statistical sampling and analysis, and so on.

Consider this question: How does the everyday person on the street in Boston respond to Boston City Hall? This question immediately leads to the following considerations:

1. History of Boston City Hall
2. Modernist architecture
3. Boston, Boston downtown, architecture of Boston
4. Opinion surveys in architecture

This question, which is neither too general nor too restrictive, was asked by Ellen Berkeley. The results were communicated to a popular audience, appearing in the February 1973 edition of Architecture Plus. Berkeley takes note of the literature on modernism (e.g., she cites Le Corbusier), contemporary commentary (e.g., she cites Ada Louise Huxtable and other critics), details of recent planning policies for the site produced by I. M. Pei and Partners (and commentary on it), and data about the building itself (publicity brochures, etc.). In addition, she was aware of the kind of survey she was conducting with passersby ("it was undoubtedly not a scientific investigation—I did not stop every tenth person for instance—and these brief interviews went off in whatever directions seemed a good idea.

Figure 3.5 A diagrammatic of Ellen Berkeley's research on Boston City Hall.

This subsection and the next two (3.2.4, 3.2.5) address the makeup of the topic in terms of the literature or literatures it draws from. Consider again Lynch's The Image of the City. What is the topic of inquiry? Lynch aims to understand what attributes of physical city form can produce clear images of the city in the experiencer. Hence his technical term imageability, "that quality in a physical object which gives it
a high probability of evoking a strong image in any given observer.” What might those qualities be? Is this the question? Well, yes, but there is more. Lynch does not want to limit his research to individual experiences of imageability. Rather, he wants to address public imageability, that is, experiences of a city’s imageability that hold true for a community of people. But what is the literature that informs this investigation? From his association with the field, Lynch’s knowledge of the literature on city form is no doubt substantial. His preface graciously mentions several people and their work in this area. But what is striking is that Lynch draws much from a variety of works having to do with perception and orientation (under the headings of “legibility,” “structure and identity,” “building the image,” etc.) and not necessarily from the literature on city form. In other words, the literature referenced reveals the fact that Lynch’s topic of inquiry involves something quite distinct from the material furnishings of city form. Rather, it intimately involves the subjective perception of those furnishings. Thus:

Structuring and identifying the environment is a vital ability among all mobile animals... Psychologists have also studied this ability in man... [Lynch gives nine references after this statement.]

Brown remarks that a maze through which subjects were asked to move blindfolded seemed to them at first to be one unbroken problem... DeSilva describes the case of a boy who seemed to have 'automatic' directional orientation... Shipton's account of the reconnaissance for the ascent of Everest offers a dramatic case of such learning... Kilpatrick describes the process of perceptual learning... Stern... Langer... etc.

Appendix A of his book cites many other sources from literature addressing perception and orientation. Lynch is also extensive in describing his research methodology, itself rooted in a body of literature (see Figure 3.6).

From a literature point of view, then, we see that Lynch built his theory by drawing from three bodies of literature: perception/orientation, city planning, methodology. He is most explicit with his connections to the perception and orientation literature; knowledge from the other two is embedded in the work. Lynch had to grapple with his topic of inquiry, recognizing that it was not the physical object of the city only, but rather the subjective images that a city can produce in a community of people. This subtle and pivotal distinction in the makeup of the question led to an association with certain bodies of literature and not others.

How is this accomplished? There is no easy answer to this question; we have already noted the creative back-and-forth between the literature and the formation of a topic in the researcher’s mind. Experience indicates that the back-and-forth process is itself key. It is rare that an initial attempt at stating a topic ends up being the final one. Usually the topic gets restated several times, often after discussion with others, as

Figure 3.6 Diagrammatic of Kevin Lynch’s research in image of the City.

recommendations for perspectives and approaches, not to mention literature, help to sharpen the research focus.

3.2.4 Using Literature Review to Understand an Idea’s Genetic Roots

A topic of inquiry tends to have a historical lineage, and the literature will contain its family tree, as it were. In other words, the literature is not only a conceptual domain of contemporary material, it is also a reservoir of historical information that contains the genetic links of an idea’s background. The topic at hand, then, should be networked not only to its contemporary connections but also to its genetic ones. Indeed, without the history, it is often difficult to make sense of the contemporary state of affairs. With this in view, it is always helpful to diagram the family tree of an idea during the literature review. As familiarity with existing sources increases, additions can be made to the tree. Figure 3.7 shows a family tree that situates Norberg-Schulz’s attempts to develop a theory of “dwelling” from the phenomenological literature.

This tree is by no means complete; further investigation will uncover other sources. But the diagram is the beginning of a map that helpfully traces the genetic roots of the theme. During literature review, each task is to “grow the tree” by mapping additional connections as they are uncovered. Uncovering these connections not only gives confidence that the problem is situated in the correct conceptual network, it also
generates material for critique. For instance, knowing on what foundation Norberg-Schulz built his theoretical arguments, how well he actually grasped Heidegger's phenomenology becomes a point of critique, if the goal is an analysis of his theory. Can Norberg-Schulz's argument be better framed by referencing material from a neighboring thinker that he does not cite (perhaps because he was not as familiar with it): Merleau-Ponty? The tree diagram is often able to draw out such questions.

3.2.5 Using Literature Review to Understand the Current Conceptual Landscape

If awareness of a literature's historical roots is important, so is knowledge of the literature in its contemporary context. This is true in two ways. First, within a discipline, one must be aware of current points of view relating to the topic. For instance, on the subject of town growth, it is clear that some literature affirms growth management policies, while other literature opposes them. Any contemporary cross-section of a literature can reveal competing views for getting to one result, opposing agendas, nuanced positions, and so on. Of course, nuances can be mapped in diagrams as well to gain an overall "lay of the land" in graphic terms.

Second and equally important is this: During any period, there are overarching intellectual agendas that tend to inform (or color) diverse investigations independent of disciplinary domain. Poststructuralism, for instance, is not really the domain of any one discipline (at least no longer), but rather describes an important general way of perceiving reality at the end of the twentieth century. Now, one indicator that a researcher is up against a transdisciplinary theme is that a "buzz-word" is usually used to stand in for a reality that many have bought into, but far fewer people can actually define. In the design fields, decomposition is surely such a word. Sustainability is another one. The researcher should identify these buzz-words, and be familiar with a cross-section of bodies of literature that traffic in them. Each body of literature will apply the term in its own way, and a rich understanding of the overall theme can be gained by grasping the nuances. Deconstruction, for example, should lead the researcher into the literature in linguistics, semiotics, structuralism and poststructuralism, philosophies of meaning, political science, and so on. All of this cross-disciplinary sampling of common themes goes towards situating the topic of inquiry in a contemporary arena; it also assures that a research result will be well rounded in its ability to confront challenges from neighboring disciplines.

3.3 GENERAL TACTICS

In this section we distinguish between facts and ideas, define primary and secondary sources, and discuss using literature review to understand research methodology. The aim is to elucidate different ways that the literature can be organized to help clarify the goals of the research.

3.3.1 Facts and Ideas

Literature can be organized in terms of facts and ideas. Jacques Barzun and Henry Graff, in their well-known text The Modern Researcher, make this useful distinction. In brief, a fact is "a clear and distinct relation held to be so by tacit agreement" (e.g., President Garfield was shot by Charles Guiteau), while an idea is a statement of inference or hypothesis (e.g., Guiteau was a disappointed office-seeker). Put another way, facts are quantifiable and certifiable pieces of information, while ideas, even though they may well be procured in the same ways by delving into the literature, tend to have more of an illustrative or interpretive role. In generating the research report, the integration of facts and ideas is important. This is particularly true in qualitative and interpretive-historical studies, where the researcher needs to get "into" a social-cultural situation not his or her own. Figure 3.8 lists a variety of aspects of fact sources that can serve to bring the researcher "into" another place or period. Newspaper articles, letters, material objects, etc., are not facts in themselves; these merely serve to represent more intimately the ideas of the day, from which the researcher can frame a more robust narration. The headings in Figure 3.8 come from
the example in Box 3.2, which is an early M.Sc. Arch. thesis draft that was fact-intensive but idea-light.

3.3.2 Primary and Secondary Sources

Another way to divide the literature is into primary versus secondary sources. [Primary sources are original sources that, relative to the topic, are not essentially commentary about the topic. Primary sources usually are the topic that other sources comment upon. Those other sources, then, are the secondary sources.] The identification of primary sources is important for the definition of a topic of inquiry. Consider again the family tree in Figure 3.7. The primary source for Norberg-Schulz is Heidegger. For Heidegger, on the other hand, the primary sources are the works of the early Greeks. Depending upon the research strategy chosen, there are nuances in what "primary" can mean. In what we call interpretive-historical research (Chapter 6), that is, investigation into past conditions, primary sources would be those that "give the words of the witness or the first recorders of an event." In qualitative research (Chapter 7), a primary source is any information that is contemporary with the period under study.

An identification of primary and secondary literature can be strategically used to frame the contents of the research. Consider the example of one of the present authors' doctoral dissertations, which used the research strategy of logical argumentation...
The topic of inquiry: How can Kant's aesthetic philosophy yield an explanation for why people feel a "sense of place," and how can this explanation be more robust than the theory put forth by the "phenomenology" of Christian Norberg-Schulz? This is of course no place to answer the question, but a map of the literature review summarizes how primary and secondary sources played key roles in generating the answer. The operative portion of the map is shown in Figure 3.10.

The diagram maps the flow of the original philosophical material in Kant's works, how this material was digested by a network of commentators and analysts (the secondary sources), and finally how a new theory was framed from material taken from both the primary and secondary sources. Also shown is the necessary engagement with the line of thinking proposed by Norberg-Schulz, to which the new theory was a response. Note the designation of Heidegger as a secondary source. Although a primary source for Norberg-Schulz, Heidegger was a secondary source for the research on Kant. This does not mean that original Heidegger material did not play a part in the dissertation; certainly it did, because the critique of the Norberg-Schulz material demanded it. But relative to the topic of inquiry centered on Kant's philosophy, Heidegger's works were secondary sources. This dynamic raises the point that "primary" and "secondary" can easily blur in meaning, depending upon the exact intent of the research. Ultimately, however, an arrangement of the literature into primary and secondary (and even tertiary) sources is integral to framing the logic of a research project. During the literature review as well as into the first drafts of the project, this diagramming should be going on, until clarity on a hierarchy of the source material emerges.

3.3.3 Methodology by Theory and by Application

A topic of inquiry is accessed by way of a research methodology. In the literature, there exist works that describe methodologies as well as works that simply apply them. A fine example where both of these realities are found in one volume is a work we refer to in our chapter on simulation research (Chapter 10), Environmental Simulation, edited by Robert Marans and Daniel Stokols. In this work, the first two chapters, by Stokols and Colin Clippson, are obviously about the methodology, while the subsequent chapters provide specific instances of how the strategy has been applied. Or again, in our chapter on interpretive-historical research (Chapter 6), the reader will see how the works by Arthur Danto, W. B. Gallie, R. G. Collingwood, and others are clearly theories about method, while the example given of Jean-Pierre Proven's work is one of an application. The researcher would do well to identify both categories in the literature review. One purpose of the present text is to provide both the theory and examples of applications for a variety of research strategies in one source.

3.4 SPECIFIC TACTICS: WHERE TO GO, WHAT TO DO

The practical "how-to" of a literature review consists of three parts: 1) knowing where the resources are; 2) having an organizing and retrieving system; 3) bringing motivation and imagination to the task. Whether these three ingredients are always equally represented in any effort at literature review is not the point. A great deal of effort spent in locating resources and amassing titles may end up in very limited original results. Conversely, a swift and fortuitous location of the needed materials coupled with a clearly defined aim and an acute imagination can produce much fruit. Suffice it to say that while percentages probably vary from case to case, it is difficult to imagine a good literature review—and a good research result—without a competent knowledge of the resources, a clear organization of accrued information, and a good imagination.

3.4.1 Where to Go: Resources

In this subsection we address the Internet as a powerful information identifier, the library as still the primary source of literature, archives as distinct from libraries, organizations and agencies, and the popular media. We use web site addresses here as the initial means to identify sources for literature in all of these categories. This is because
the Internet makes available at the fingertips of today’s researcher an array of sources that would have astounded a researcher merely 20 years ago. We address it first because more and more it is used to find out where the resources are. The following tools are usually used:

Internet Search Engines. Even without knowledge of any specific web addresses, typing a key word into an Internet search engine can lead to innumerable web sites containing that word. Common Internet search engines include Altavista http://www.altavista.com/, InfoSeek http://www.go.com/, and MetaCrawler http://www.metacrawler.com/index.html. A generally recognized "meta-search engine," or a search engine that searches search engines, is Dogpile http://www.dogpile.com/. We typed "city image" into Altavista and found addresses for more than two million web pages. At this point, a search engine can usually narrow the search by domain. Under the "education" domain in Altavista, we located a site from Florida State University addressing the following themes related to city image: cognitive maps, sense of place, characterless places, and a questionnaire on cities void of sense of place.24 Another link led us to an entire book in electronic form on a case study of the changing city image of Heusden in the Netherlands, with due mention of Lynch's work.25

Specialized Search Engines. Academic institutions usually subscribe to a variety of services offering specialized search engines in various disciplinary domains. The Avery Architectural Index, attached to the Avery Architectural & Fine Arts Library, Columbia University, and operated by Research Libraries Group, is an example; the general web address is https://eureka-alg.org/, although an additional password is needed per institution. Other useful specialized search engines are Arts and Humanities Search, First Search More (under Art Abstracts), and PsychINFO, which leads to many works relevant to environment-behavior research.26 For instance, we searched "environmental aesthetics" in this engine, and the first article to come up was one on community meanings of town character, which makes use of material from Lynch.27

Full Text Services. Complete texts of journal articles or even books can be accessed via the specialized search engines. For instance, the article above from PsychINFO is available in full text format via the Internet. The terms eJournal and eBook refer to this service. ProQuest Direct, Science Direct, Ideal, and NetLibrary are just a few of these full text services. Again, university (research) libraries subscribe to these services, so users of their systems can generally download a complete text without charge. In the case of entire books, the site is generally open to the user for a limited period of time, after which a charge may be required.

Library Databases. Most library catalogues are now accessible via the Internet. One example is the catalogue of the Library of Congress at www.loc.gov/catalog/

with the largest collection in the world. A keyword search for "city image" at this site produces the following response: "Your search retrieved more records than can be displayed. Only the first 10,000 will be shown." Item 15 in this search happened to be "Lynch, Kevin, 1918-... Image of the city, 1960." While of course the works themselves cannot be accessed through the Internet, these listings are useful research tools in that they allow many topical connections to emerge.

Specific Web Sites. There are of course specific web sites that researchers become acquainted with in various ways. A handy listing of architecture sites can be found at http://www.bc.edu/bc_org/avp/cas/arts/archweb_noframes.html.

The library is still the place to conduct most research. Research libraries are usually attached to universities, and these reflect the research interests and strengths of the particular institution. The holdings of public libraries reflect the town or city in which they are located. For the researcher in architecture, this may be of particular importance if the research question has to do with a community's history. Special libraries are attached to institutions such as hospitals or corporations, and have holdings that pertain to that particular organization.

A tendency among research libraries is to cross-list their holdings in one centralized system, so that all materials are available via interlibrary loan. For instance, the Big 12 Plus Libraries Consortium is a network of university research libraries in the Midwest and West whose member number continues to increase. The catalogues of libraries in this consortium can be accessed as one source on the Internet. The homepage for the Big 12 Consortium can be found at http://www.big12plus.org.

Literature review can involve archival materials. An archive is a limited-access repository of materials, usually connected to a particular entity (government body, organization, institution, even individual), organized and maintained for long-term safekeeping and for selective review and use. These "traces of past human activities" can include "letters, diaries, confidential memos, lecture notes, transcripts, rough drafts, unpublished manuscripts, and other ... records."28 Generally, the topic of inquiry will lead a researcher to identify organizations that may have the relevant archives. Then, contact must be made with the archive to learn what the requirements for accessing the material are. Not surprisingly, this task is again made easier by the Internet, as more and more archives are putting their information on the web. Furthermore, universities are beginning to link catalogues of their archival holdings with their library information retrieval systems. A National Archive of the United States can be accessed at http://www.nara.gov/.

Documents from organizations and agencies are another source for literature review. Government agencies such as the Department of Housing and Urban Development http://www hud.gov/ are a source for literature related to housing. The HUD web site connects to http://www.huduser.org/, which leads to publications, periodicals, ongoing research, bibliographic databases, and so on. Professional organizations
offer literature pertaining to their disciplines, a significant amount of it research-oriented. One example is the American Institute of Architects’ website at http://www-aia.org/. This site connects to other sites with relevant research interests; for example, a search led to sites published for a summit on “Communities of Tomorrow,” the AIA Center for Advanced Technology Design, an international conference on architecture and health, AIA market research, and many more. Similarly, many disciplines related to the building trades publish extensive information on research; one example is the American Society of Heating and Refrigerating and Air Conditioning Engineers (ASHRAE) at http://www.ashrae.org/. This site offers connections to an abstract center, position papers, publication updates, comment on publications, and continuing education. Testing agencies also generate literature. For example, the National Fire Protection Association (NFPA) web site http://www.nfpa.org/ links to codes and standards, conferences, research and reports, a special journal on fire research, fire data analysis, the Charles S. Morgan Technical Library, and the NFPA archives. Literature is also developed by many private companies serving the architectural profession. For example, the web site for the furniture systems company Herman Miller http://www.hermanmiller.com/ links to a page that contains case studies, research papers, and issues papers: http://www.hermanmiller.com/index.hbk/US/en/WR.

The popular media is also a rich source for literature review. The researcher usually needs to situate popular materials within a larger theoretical framework of analysis or criticism; but given this, particularly in the realm of interpretive research, materials from popular media often lend depth to a research report. We leave the kinds of popular sources to the researcher’s imagination because they are abundant: newspapers, popular magazines, views of theater and other entertainment productions, advertisements and other marketing literature, novels, and other forms of fiction, editorials, political commentary, documentary films, and so on. Again, many of these sources can be accessed through the Internet. For instance, a search of www.amazon.com is as valid as any other literature source. Many newspapers and periodicals update their web sites daily.

3.4.2 What to Do: Organization and Retrieval

Locating the resources is one thing, but organizing them and making some sort of conceptual sense out of the information is quite another. We recommend Bazran and Grall’s The Modern Researcher, already cited above, as perhaps the definitive work on this topic. Our comments here are distillations of their recommendations with some personal experience added. In brief, the researcher must digest the gathered information in order to frame the research report. This takes an organizing schema that includes note taking and cataloguing for retrieval, all admixed with a creative imagination.

As to note taking, pieces of information found in the literature deemed relevant for an emerging topic of inquiry need to be noted in a systematic way. The mode by which this is done is less important: by index cards, by a notebook, or by the laptop computer. Notes need to record all of the bibliographic information of the source. In addition, as Bazran and Graff point out, the writing of a note is the first step toward framing an idea.28 Initial notes can also be taken by annotating the source material itself. Of course this requires ownership of the material. The proliferation of full text services on the Internet, along with the availability of inexpensive editions of many texts, makes this a small price to pay for research results that may be lasting. Such notes also serve as a permanent record of sorts—referring to a passage in an annotated text will always link to the research idea connected with it. Figure 3.11 is from the present author’s annotated copy of Kant’s Critique of Judgement, the primary source of his dissertation work. The penciled diagram in the top margin was the beginning of an idea that eventually led to one of the explanatory diagrams in the final work (reproduced at right).

Bazran and Grall stress that the researcher must have a “love of order.”29 Operationally, this means having a system that allows for any piece of information to be retrieved. During the initial “hunt” through the literature, whether on the Internet, in a library, or in some other venue, the present author simply keeps a notebook with jottings recorded chronologically. Figure 3.12 is one page from the notebook containing
information for this chapter—in fact this very section. (The messiness of this page, taken during an interview with a librarian, illustrates the tension between the ideal of taking neat systematic notes and the "real" of the situation; so we include it as illustrative. The facts should subsequently have been organized in a more coherent way.) As the research process advances, the initial notes can be further distilled or expanded into brief sentences or paragraphs which are in turn organized either by literature area, by subtopic, or by chapter concentration of the research report, once that structure begins to emerge.

Operational considerations aside, note taking and note organization mean nothing without the ability to engage in concept formulation. This is also part of "what to do," but it necessarily mixes with issues of creativity and imaginative thinking. We have discussed this earlier in the chapter, suggesting that, even though imagination is hard to quantify, disciplined interactions with the literature can be good training. Barzun and Graff's initial chapters ("The ABC of Technique," "The Searcher's Mind," etc.) are difficult to add to, so we refer the reader to that work.

3.5 RECOMMENDED READINGS

As noted, Jacques Barzun and Henry Graff's The Modern Researcher ought to be in the personal library of all researchers, particularly those involved in more qualitative and interpretive research. We have cited this work often in this chapter.

Although not written for the design fields, we recommend referring to the mapping diagrams provided by Chris Hart in Doing a Literature Review.31 We have cited this book earlier in this chapter. Hart goes into more depth than we do on different kinds of mapping. For instance, feature maps result from organizing articles by their bibliographic information, along with key theoretical standpoints; a collection of these reveals useful patterns that can be captured in a diagrammatic map. Tree constructions diagram major ideas and sub-ideas (different from our "family tree" of Figure 3.7 in that they do not require the temporal element). Subject relevance maps, taxonomic maps, and concept maps, are some others Hart covers, and these can no doubt be helpful to those doing architectural research.

Two works by Paul Leedy that we did not cite in this chapter are a) A Key to Better Reading (New York: McGraw-Hill, 1968); although an older book, this has general pointers for reading that are timeless; and b) How to Read Research and Understand It (New York: Macmillan, 1981); this is useful for those doing quantitative research.

Chapter 5 ("Reading Other People's Research") of W. Lawrence Neuman's Social Research Methods (Boston: Allyn and Bacon, 1997) is also worthwhile.
NOTES

4. Ibid., 140, 152–154.
8. Ibid., 12–23.
16. Ibid., 7.
17. Ibid., 3.
18. Ibid., 11, 13.
19. Ibid., 123–139.
21. Ibid., 114.
24. Lisa Waxman, “Cities and Towns” (Florida State University, 1999). Available at http://and6601-01.qpolu.fsu.edu/citytownable/td413.htm
26. http://newfirstsearch.oclc.org/WebZ/FSPenefit/entityjsdetect=javascript:truescreen-size=medium;sessionid=sp02w11-34526-c9styf6x4-kdha2ventitypagenum=1:0
30. Ibid., 44–45.