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Literature reviews occupy an important corner of the world of scientific activity, yet most scientists do not receive training in how to write them. In the early days of psychological research, many people did their research based on intuitions and personal insights, and one did not have to spend much time in background reading simply because there was not much to read. As our field's knowledge base expands month by month, however, it becomes increasingly important to be able to master the amount of information already published. New ideas increasingly have to build on previously published works.

In many cases, psychologists can now test their theories without collecting data at all—they can simply rely on works already published. Many literature reviews represent empirical tests of hypotheses. There is already so much published information that you can probably find some information on almost any broad question about human behavior. To be sure, collecting new data will continue to represent the vital core of scientific activity, but literature reviews will be an increasingly important and common part of scientific activity.

Literature reviews are special for a couple reasons. First, they combine results of many different studies and that gives them power and value that no single study can have. The results of any one study might be tainted by experi-

menter bias, random fluctuations in the data, methodological errors, and other such problems. Hence it is always risky to draw too firm a conclusion based on a single study. In contrast, literature reviews often combine data from dozens or even hundreds of studies. When so many findings point toward the same conclusion, one can have high confidence in the correctness of that conclusion. It is unlikely that many different studies will yield similar results because of experimenter bias or other such problems.

Second, literature reviews permit researchers to address broad questions. Researchers may start with broad questions like “Does money bring happiness?” or “Are religious people healthier than others?” or “Are men more ambitious than women?” But a single investigation is limited to its sample, procedures, and measures, and so it will not usually permit the researcher to furnish a strong answer. For example, happiness can be measured in many different ways, and even money could be assessed in terms of salary, wealth, savings, or change in any of the above, and so unless one study has used all the different possible measures, it cannot justify a broad conclusion. In contrast, a literature review can draw on studies that used all different methods and measures, and so a sweeping conclusion can be justified.

To put this another way: The research journals are full of findings that are less than fully interpreted. Reviewers will not usually allow the author of a single investigation to draw sweeping conclusions that go beyond the limitations of sample and procedure. Literature reviewers can

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however make such broad conclusions and interpretations. For people who are interested in grand ideas and broad questions, literature reviews constitute an excellent and exciting means of addressing them.

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## Narrative and Meta-analytic Reviews

There are two different strategies for reviewing literature, and these are called narrative review and meta-analysis. Narrative review approaches are more traditional, and indeed almost all literature reviews prior to 1980 used them. They consist of providing qualitative descriptions of the results of many previous studies. Meta-analysis, in contrast, is a newer approach that uses a quantitative method of combining the results of previous studies.

Although there is some tension between the users of the two methods, and some experts who favor meta-analysis disdain narrative approaches as obsolete, my opinion is that the two methods serve different goals and therefore both have a valuable place in science.

Meta-analysis is the preferred method for combining the results of many studies that use comparable methods to address the same question. In contrast, narrative reviews are more useful for combining results from studies that may use very different methods and procedures and that address different questions. For example, if you wanted to combine the results of many studies on gender differences in domestic violence you would certainly use meta-analysis. Gender always means the same thing, and domestic violence is measured in a few rather standard ways, and so it is appropriate to combine the results of many studies to determine what the result is. Thus, Archer (2000) did precisely that and was able to conclude that women are more likely than men to initiate physical violence toward a spouse or dating partner, as well as showing the difference across many studies is quite a small one.

In contrast, narrative reviews can be useful for combining quite different kinds of evidence to formulate a broad theoretical formulation. Baumeister and Leary (1995) reviewed very

diverse literatures in order to conclude that a “need to belong” is one of the most pervasive and powerful human motivations. To make their case, they sought to show that the need to belong is involved in a wide range of very different patterns of behavior, including thought processes, emotional reactions, forming and breaking off relationships, physical and mental health, and lifelong happiness.

In addition, most empirical articles and dissertations contain some review of relevant previous literature and these are typically narrative. They are used to set up the hypotheses for the present study by linking the various steps in the theoretical argument to previous findings.

Thus, the first step in writing a literature review is to decide what kind of review to write. If you are looking at many different studies on the same hypothesis, meta-analysis is generally better than narrative. If the goal of your review is to formulate a new theory that will link together diverse strands of work, then you may favor a narrative method instead. Put another way, meta-analysis is the better method when it is viable, but there many things meta-analysis cannot do, and in those cases narrative reviews can be quite valuable.

Regardless of which method, it is also important to be thoughtful and open-minded when conducting reviews. Recently, there have been several cases in which published meta-analyses yielded conflicting, incompatible conclusions (see, for example, Blackhart, Nelson, Knowles, & Baumeister, 2009). These episodes have led some to begin to question whether meta-analyses live up to their reputation for being able to provide definitive conclusions (see discussion by Baumeister, DeWall, & Vohs, 2009). That meta-analyses have flaws does not mean that narrative reviews are inherently better, and if anything they may be more susceptible to misleading conclusions or fallacies. There are no perfect methods in social science.

## Searching the Literature

Regardless of what kind of literature review you plan to write, a first step is finding the evidence.

The research literature in psychology has been expanding rapidly for several decades, and each month hundreds or even thousands of new articles are published, and so the task of finding everything you want can be formidable. If you intend to write a good literature review, you should strive to be as thorough as possible. You will lose credibility if the people who read your literature review can say, “Hey, you forgot to include such-and-such a study.”

Recent advances in computer indexing have greatly expanded the literature reviewer’s ability to search large databases for every potentially relevant article. These are becoming ever easier to use. With only a few instructions, you can learn to conduct such searches. Typically they will give you a (long) list of abstracts of articles that refer to whatever key words you type into the computer. You can restrict the search not only by topic but also by time (e.g., you might request only the publications from the last 10 years), by journal, and by other factors as well. Still, the odds are you will end up skimming a long list of abstracts to identify the articles relevant to your cause.

You should keep notes of how you run the computer searches, because you should report your search method in the manuscript itself. Indicate what database(s) you searched, what keywords you entered, and how you restricted the search. The purpose is to let the reader know how you got the information that you are summarizing in your paper.

For some topics, computerized searches are not helpful, because the topic has not been specified. For example, Baumeister (2000) reviewed diverse literatures to formulate and test a hypothesis about female erotic plasticity (i.e., the degree to which the sex drive is affected by social, cultural, and situational factors). Because erotic plasticity was a new theory and a new concept, that article relied on reinterpreting studies that were conducted to test quite different ideas. Using “erotic plasticity” as a term to search a database would have yielded nothing, and a broader term such as “sexual desire” would have yielded many irrelevant findings. In such cases, reviewers must fall back on older methods of finding sources. The obligation to be careful and thorough remains strong, however.

One valuable method of searching the literature without computerized aids is to find the most relevant journals and examine every article they published. In some fields there are prominent journals that are devoted to a topic and are likely to contain most of the relevant articles (as well as many irrelevant ones). For example, to do the paper on erotic plasticity I began with the *Journal of Sex Research*, and in an earlier paper on suicide (Baumeister, 1990) I could rely on *Suicide and Life-Threatening Behavior*. Typically I begin with the most recent years, on the assumption that new articles will contain references to important older works. A good strategy is to read every abstract in the journal. (An abstract is a short summary of the article, and nearly all research journals have these for every article, so it is often possible to cover a lot of ground in fairly short time, just by reading these summaries.) If the abstract shows that the work is relevant to what you are doing then you read the article itself. Otherwise you move on.

When reading the article, it is important to pay special attention to sources that it cites, especially ones that lie outside the journal you are studying. Make a list of other sources to look up. Don’t be discouraged if your list soon grows long, for many articles will turn out to be not all that relevant, whereas everything you do find (that is relevant) will strengthen your paper.

## Meta-analysis

There are standard procedures for conducting a meta-analysis, and if you plan on using that method you may want to work with someone who is already an expert or consult one of the published sources as a guide. Helpful works include Wolf (1986), Hedges and Olkin (1985), Rosenthal (1983, 1991), Cooper and Hedges (1994), and Cooper (1990).

In general, meta-analysis works by converting the findings of many different studies into a common measure that can be used to combine them. Typically you translate your independent variable into two categories or experimental conditions. For example, you might want to compare men against women. Then you look at the difference

between them in each study. The standard way of expressing this difference is in standard deviation units. That is, you take the average for men, subtract the average for women (to produce the difference), and divide the result by the size of the standard deviation. (You may have to compute an average standard deviation, if the paper gives separate standard deviations for men and for women.) This is called *d*. You will therefore have a *d* for every study, and indeed in some cases you will have several *ds* for each study.

Be sure that you always subtract in the same direction and preserve the sign of the difference. Thus, if you subtract the women's mean from the men's mean, then a positive number signifies that men scored higher, whereas a negative number indicates that women scored higher—which is something quite different. In many cases, you can get all the information you need from the tables published in the article. If the article does not publish standard deviations along with the means, you can sometimes estimate them from the other statistics that are reported, but for this you should get a statistical expert (at least a professor) to help you.

From there, it is a short step to get an overall result. You compute an average *d* across all the different studies, simply by averaging all the *d* values you have obtained. (Again, be sure to preserve the positive and negative values, so that these may cancel each other out when you add them together.)

The combined (average) value of *d* sums up the results of all the studies you have included. You can establish whether it is significantly different from zero and also how large it is. By convention (Cohen, 1977), a *d* of about 0.3 is a small effect, 0.5 is medium, and 0.8 or more is large.

Meta-analysis can be made more complex and more theoretically interesting if you sort the studies by important factors. To do this, you code each study when you look at it and then see how *d* varies with your codings. For example, Oliver and Hyde (1993) conducted a meta-analysis of gender differences in sexual behavior, and they coded their findings by the year in which the study was published. In this way, they could look at changes across time. For example, they found

that gender differences in many variables (such as support for the double standard of sexual morality) were larger in older articles and smaller in new ones, indicating that men and women had become more similar over time.

## Narrative Reviews

Even if you do not use a meta-analysis, it is important to make an effort to be thorough and balanced and to indicate how all the information you present fits together. In contrast to meta-analysis, narrative reviewing has not elicited many books or papers to explain the procedures, although some useful tips have been furnished by Bem (1995) and Baumeister and Leary (1997).

One particular benefit of a narrative review is that it can integrate results from very different methods and procedures. When you try to evaluate all the information you have found, you should give some thought to how many different research methods pointed toward the same conclusion. To illustrate: five studies that led to the same conclusion from different methods are quite convincing, as compared to five studies that found the same result using the same method. To be sure, having five studies get the same result with the same method is somewhat good, and such a pattern shows that an effect is reliable and can be obtained repeatedly (perhaps by different researchers). It is however possible that that method contains a hidden source of bias or error, and so each study that uses the same method simply repeats the same error, thereby producing a distorted result. In contrast, if five studies with different methods point to the same conclusion, one can have high confidence that the conclusion is not the result of some bias or flaw in any one method. It is also unlikely that the different methods will all lead to the same flawed conclusion because of all different biases. Methodological convergence is therefore a valuable tool for the literature reviewer, and the greater the methodological diversity, the stronger the paper and its conclusions. Hence you should always discuss the methodological diversity of your findings and the implications of its presence or absence.

For example, Baumeister, Catanese, and Vohs (2001) sought to investigate the question of whether men or women have a stronger sex drive. There is no one optimal way of measuring the strength of sex drive, and any one measure might be questioned. Thus, if men report thinking about sex more often than women, this might reflect merely a greater willingness of men to report their sexual thoughts. Accordingly, we came up with almost a dozen different indices of strength of sex drive and then sought evidence of gender differences on all of them. The convergence was decisive: On every measure (desired frequency of sex, frequency and variety of sexual fantasies, frequency of arousal, desired number of sex partners, willingness to forego sex, initiating vs. refusing sex, frequency of sexual thoughts, scope of sacrifices made for sex, and so forth) men exhibited higher sex drives. The point is that only the convergence across multiple methods and measures permitted a strong conclusion. If men had scored higher on some measures and women on others, the conclusion would have been very different. And if the studies had all used the same method, the conclusion would have had to be much more tentative, no matter how many studies there were.

At present, meta-analysis does not have a procedure for integrating methodological diversity into its calculations, and so the five studies with different methods will not score any better than the five studies with the same method. Recognition of methodological diversity is therefore (for the present, at least) a major advantage of the narrative reviewer. In my view, an important challenge for statisticians is to come up with a means of incorporating methodological diversity into meta-analyses.

### **Hypotheses in Advance?**

Most courses in experimental methods insist that researchers should have their hypotheses clearly spelled out before they collect their data. This requirement is made partly to prevent people from “capitalizing on chance.” That is, if someone conducts a large study with many

different measures and conditions, by random chance alone something is likely to turn out to be statistically significant. Researchers call such approaches “fishing expeditions,” because the researcher is like someone who goes fishing and does not know what he is going to catch but will settle for almost anything. Such exploratory studies do have a role in science, but mainly as ways of generating ideas for further research. For a researcher to describe such findings as if they were predicted in advance is therefore misleading, and capitalizing on chance can lead to false conclusions getting published and thereby lowering the value of the knowledge base that all future scientists will use to guide their own work. Some researchers treat the practice of developing hypotheses after the results are known (called “HARKing”—an acronym for Hypothesizing After Results are Known; see Kerr, 1998) as an unethical violation of scientific honesty. By requiring researchers to specify their hypotheses in advance, the field protects itself from these errors.

A literature reviewer does not need to be so scrupulous about having hypotheses in advance, however. First and foremost, the danger of capitalizing on chance is greatly reduced in a literature review as compared to a single study. A single study might by chance produce an odd, misleading result here and there, but a literature review combines the results of many different studies, and it is highly unlikely that a chance result will occur over and over.

Indeed, my view is that literature reviewers should be much more flexible in their thinking than experimentalists. If you have a firm hypothesis and are committed to testing it alone, you may miss valuable and important patterns in the data. Perhaps your initial theory will not be supported, but by working with large numbers of published studies you might find other patterns that make important, valuable contributions to the field. You might realize that your initial hypothesis framed the question wrong.

If anything, strong commitment to an initial hypothesis might create bias in a literature reviewer. A reviewer who is locked into one idea or one way of looking at a phenomenon may end

up imposing his or her rigid ideas onto the data and thereby produce a conclusion that is misleading.

Personally, I think clinging to strong initial ideas reduces much of the fun of literature reviewing. I write literature reviews because they help me learn new things and sometimes create new ideas. An open-minded search for patterns in the literature is much more conducive to this than a rigid hypothesis-testing approach. Let the literature surprise you!

In short, I recommend that literature reviewers try to remain open-minded when reading the literature and be willing to revise their theories substantially. There is no consensus among experts on this issue, and so it is possible that some experts would disagree with my recommendation. Still, my own experiences in writing many literature reviews has found that my initial theories and hypotheses were often quite wrong and in other cases seriously oversimplified. It would be a shame to fail to learn and change one's thinking during the process of reading a large amount of research findings.

## The Value of Null Findings

Every laboratory experimenter dreads the "null finding," which is essentially the no-difference conclusion. The null hypothesis is that no difference exists between the control condition and the experimental conditions. Typically researchers are trying to support their theories by finding positive evidence that some differences exist, and so the null hypothesis is the opposite of what they want to find. Usually null findings are considered unworthy of publication, because they are inherently ambiguous. For example, sloppy work or poor measures will produce null findings, and in those cases it would be fallacious to conclude that the researcher's theory was wrong. Hence a null result is very discouraging to the experimenter, because it is a kind of failure, and it is not possible to advance one's career by publishing null results.

The literature reviewer is in a quite different situation, however, and null results can be important. For one thing, it is important for researchers (especially meta-analysts) to include null findings

in their calculations. For example, suppose ten studies found no difference (and weren't published) whereas two studies did find a difference. A meta-analysis that concentrated only on the two successful studies might conclude that there is positive support for the theory, but a meta-analysis that included the ten null findings would probably draw the opposite conclusion. Yet because null findings are generally not published, there is a real danger that literature reviewers will end up only finding the two successful studies.

One solution to this problem is to include theses and dissertations. In recent years, meta-analyses have come under increasing pressure to include unpublished theses and dissertations, simply because these will give some indication of null results. That is, if a professional researcher comes up with null findings, he or she will probably never write them up (because the journals generally refuse to publish them), but dissertations get written even if the study yields null results. The use of dissertations is at best a partial solution to the problem of unpublished null results, but it is a step in the right direction.

What about if the literature review itself produces null results? A literature reviewer is not as vulnerable as an experimenter to the danger of null results. Indeed, a literature review that concludes there is no difference can be published. For example, DePaulo, Charlton, Cooper, Lindsay, and Muhlenbruck (1997) meta-analyzed the results from many studies on people's ability to detect lying and deception in others. In particular, they focused on whether people's objective accuracy was linked to their subjective confidence. In countless courtroom scenes in movies and television, there is a crucial point at which the lawyer points to the defendant and asks the witness "Are you *sure* that this was the person you saw?" DePaulo and her colleagues concluded that the statistical relationship between confidence and accuracy across all the studies in their sample averaged out to a paltry 0.04, which was not significantly different from zero. In plain terms, lawyers should not bother asking witnesses whether they are certain, because their degree of certainty bears no relationship to whether they are right or wrong.

A literature review may also succeed in showing that the totality of existing evidence is inconclusive. Perhaps many of the studies are flawed or confounded, or they point in opposite directions. Such a literature review might conclude that “we simply don’t know yet.” It still performs a valuable service to the field by highlighting the limitations in current knowledge. It can help advance the field by pointing out that an issue that experts have assumed to be settled is in fact unresolved, and so more (and perhaps better) research is needed.

### Types of Possible Conclusions

Four possible conclusions can emerge from a literature review. This is far more than from a standard experimental study, which typically can only draw one positive conclusion or else the ambiguous failure to reject the null hypothesis.

The first conclusion is that the theory or hypothesis is correct. After reviewing many different studies and combining the information from them, the reviewer draws a confident conclusion that the idea has been well supported and should be considered true, at least until and unless some strong contradictory evidence emerges from future work.

The second is that the hypothesis is not proven but is currently the best guess. The reviewer says that it would be premature to draw a strong conclusion that the truth has been found, but there is enough quantity and variety of evidence to permit a tentative conclusion. This conclusion says that the burden of proof should be shifted onto anyone who wishes to conclude otherwise, but it is quite conceivable that this will happen. For the time being, the field should proceed as if the theory is correct, even though more research is needed before one can consider the matter settled once and for all. Such conclusions are especially important in matters relevant to psychotherapy or applied psychology, because many practitioners cannot wait around for 25 years until somebody decides that an issue is definitely proven. Therapists have to use the best available evidence to deal with problems

in the immediate present. It may be helpful to them to know the difference between a definite, proven fact and a best guess, but in most cases they may find it necessary to base their work on these conclusions. In other words, a “best guess” is much more useful and helpful for them than the “wait and see” shrug that purists might favor.

The third conclusion is that the available evidence does not permit a confident conclusion (even a best guess) either way. This may arise because there is not enough evidence available or because different studies cancel each other out by coming to opposite conclusions, or because a few pervasive methodological flaws render the evidence unreliable. It is often helpful to the field to be told what it does not know—perhaps especially if people have assumed that some view is strongly supported when it is not. If your literature review draws this conclusion, it is especially important that you spell out the requirements for future researchers who wish to provide more conclusive evidence.

The fourth conclusion is that a hypothesis is false. After reviewing all the available evidence, you find that the theory has consistently failed to gain support. Possibly the evidence points to the opposite theory, or in other cases a meta-analysis may show that there is no difference. In either case, the literature review concludes by saying that a theory should be abandoned and regarded as wrong. A variation on this might be that there was indeed a significant relationship overall, but the effect is so small as to be hardly worth talking about and is unlikely to make much difference in actual behavior.

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### Common Problems and Errors in Literature Reviews

Because few people receive explicit training in how to conduct a literature review, many end up having to learn it by themselves, often by trial and error. This section summarizes some of the common problems among literature reviews.

## Uncertain Purpose

It is important to know what the goal of your literature review is. Many people think, “The goal is just to summarize past work on the topic!” However, a simple summary of previous findings does not generally make much of a contribution, and so that kind of review ends up being difficult to publish.

Ideally, a literature review should have a clear goal of advancing the field’s theoretical understanding of some issue. It may propose a new theory that links together a diverse array of findings. Alternatively, it may evaluate a theory by testing it against the wealth of published work. In both these cases, the article will offer a new, improved understanding of the phenomena. Simply providing a list and summary of findings on some topic is not enough.

## Vague Introduction, Poor Organization

The introduction to your literature review should spell out the goals of your review (see previous section). It should also explain the theory carefully and thoroughly. This may seem obvious, but many writers of literature reviews do not follow this plan. Some are tempted to offer only a short introduction that focuses on the importance and interest value of the question. Then they present all the research findings. Only after all the material is described do they begin to offer their own theoretical ideas of what the important patterns and conclusions are. Many writers may feel that this organization accurately reflects how they produced the paper. Often a person will start reading with only a basic curiosity about some phenomenon or a sense that it is important. Then the person accumulates findings, and after they are all in hand the person starts to think about what they mean.

Unfortunately, this style of organization produces a paper that is very difficult to read. Readers need to know where the paper is going. You cannot expect a reader to keep dozens of research findings straight in memory before finding out how they all fit together.

Hence it is important to put all your theorizing in the introduction, even if you actually did construct your theories after you finished reading the literature. You should not mislead the reader by falsely claiming that you had these theories in advance, but the reader needs to have the broad theoretical ideas in mind when reading through the summaries of research findings. Of course, you do not have to offer only one single theory in the Introduction. It is often useful to set up your literature review as a competition between two or more theories. Explain how each of them is reasonable and plausible and indicate how you will look for evidence that will show which of them is correct.

Your presentation of research findings should then be organized on the basis of your theory. For example, if your theory has three steps, you would probably organize your presentation of the research by those three steps. Do not make the mistake of feeling that you have to summarize the literature in the way it has usually been understood or presented. Remember, the goal of your literature review is to achieve a new understanding of some phenomenon, so it is quite appropriate to break free from the conventional ways of thinking about the topic. Developing or evaluating the theory is the purpose of your review, and the way you organize your presentation of findings should reflect and serve that purpose.

Once you have presented all the material, you can then provide a General Discussion section that sums up what you have found. Which aspects of the theory are well supported? Which have been disproven? Which require modification? Which require further evidence? Try to imagine how someone who supported the theory would evaluate the weight of evidence and then imagine how someone who opposed the theory would evaluate the same evidence.

Thus, the plan of the paper is to present the theory first, then the review of findings, and then a discussion of what has been learned. This organization is not all that different from how one writes up an experiment or other empirical report. That is no mere coincidence: Rather, following that organization is an effective way to communicate information with readers.

## Not Enough Information

Another common mistake is to fail to provide enough information about the literature you review. Occasionally one makes the opposite mistake, such as by providing excessive detail about some of the studies one covers. But simply because of the constraints of how long a manuscript can be, the more common error is to present too little information.

The most common form of this error is to say what some study concluded without indicating how it reached that conclusion. After all, this is what many researchers do when writing the introductions to their empirical reports. But it is not sufficient for a literature review. An empirical report contributes original data. A literature review relies on its presentation of previous work to justify its conclusions. Hence it is necessary to spell out the nature of that evidence.

In general, a literature review should summarize the specific methods and findings of the studies it cites, rather than just the conclusions. In a narrative review, this is a matter of summarizing how each study was done and what it found. In a meta-analysis, one indicates precisely what kinds of procedures and measures were used. Sometimes this can be done in a large table. One way or another, however, the reader must be told what the substance of the previous investigations was.

In many cases, a sentence or two may be sufficient for summarizing each study. It is not necessary to spend multiple paragraphs on every previous article. But readers should be given sufficient information so that they can make up their own mind as to whether the evidence supports the conclusion.

## Failing to Connect to Take-Home Message

When Sternberg (1991) took over as editor of *Psychological Bulletin*, he directed authors to make sure that their manuscript had a “take-home message.” In a sense, his directive conforms to my earlier comments about making sure that your paper has a purpose of developing or evaluating a

theory, rather than just summarizing the current state of knowledge on some topic or other. The take-home message should be stated explicitly in your General Discussion and in your abstract. You can recognize it easily: It is what you would answer when someone asks you what the point of your paper is. If your answer to such a question is along the lines of “There’s a lot of research on attitudes,” or “There are plenty of sex differences,” you should hear an alarm go off, because that is hardly important enough to be worth publishing.

The take-home message may not have been in your mind when you started the project. Indeed, if you remained open-minded as I recommended, you may not have known what the take-home message would be until you completed reading the literature and spent some time rereading your notes and thinking about how they fit together. Still, the take-home message is the capsule value of your paper, and *everything in the paper should refer to it*.

The obligation to make the connections to your take-home theme may seem obvious with the Introduction and General Discussion, but it is also important in your coverage of the research findings. Do not fall into the trap of describing study after study on its own terms, such as by presenting methods and results but without stating the implications for your theory. Readers need to be told explicitly how the various findings fit into the theoretical scheme of your paper and how they contribute to the take-home message. You may do this for individual studies or for groups of studies, but it is not adequate to leave this until the end of the paper.

## Be Critical!

Another common mistake is to forget to criticize the research you cover. In psychology and the other social sciences, hardly any methods are perfect. You should indicate their limitations. Again, this is something you can do study by study or in groups of studies, but it needs to be done. One format I have found useful is to organize the presentation of research findings into subsections,

each of which has a single theoretical point to make, and provide a summary critique at the end of each subsection (e.g., Baumeister, 1990). This summary critique can evaluate the group of studies as a whole. Thus, if one study has a problem or shortcoming but another study has reached a similar conclusion but avoided that problem, you do not need to waste space criticizing the problem in the first study—you can point out that the conclusion is not tainted by that problem, insofar as studies have reached the same conclusion without that problem. A summary critique can also evaluate the amount and methodological diversity (i.e., converging evidence) of the evidence.

Forgetting to criticize is especially common among authors who have a favorite theory and are presenting evidence to support it. They might even feel they are undermining their take-home message by criticizing the evidence that supports it. They are wrong, however. The contribution of your paper is that much stronger if you can indicate the weaknesses (as well as the strengths) of the evidence. If the critique means that you have to downgrade your conclusion from a proven fact to a best guess, so be it: All that means is that researchers should continue to study the problem rather than considering the matter settled. Remember, flaws or gaps in the published literature are not your fault—but neglecting to point out flaws or gaps in the literature is your fault. Your role is not that of a lawyer who tries to make the best case for one side of the argument. Rather, your role is to be a judge and jury, skeptically evaluating the evidence for both sides and rendering the fairest judgment possible.

Assuming you want to publish your literature review, it is helpful to consider the perspective of the editor who will decide whether to accept it. Editors do like to have novel theories and interesting ideas presented in their journals. They do not, however, want their journal to have articles that overstate the case for these ideas. Imagine that you are an editor who publishes many articles that are later proven to be wrong because of overzealous statement of unjustified conclusions: You would probably feel ashamed. When you write a literature review, make your case, but be frank about the limitations in the evidence you review.

A related error is the failure to adjust your conclusions based on your critique. I have seen this in particular when an author submitted a paper without any critique of the evidence and then was told by reviewers to add such a critique. Some authors will dutifully furnish the critique, but they then leave the same strong, optimistic conclusions they had in the first place. Before you state that the evidence for or against some theory is “strong” or “clear” or “convincing,” you should evaluate the weight and diversity of that evidence as well as your critique of its flaws, shortcomings, and ambiguities. In other words, look at both the strengths and weaknesses of the literature you have reviewed, and only then decide how strong a conclusion is warranted.

### **Exceptions and Counterexamples**

The normal, everyday thought processes of ordinary people involve selective coverage or selective critique of evidence (e.g., Kunda, 1990; Lord, Ross, & Lepper, 1979). For example, people may recognize evidence contrary to their position but apply stricter critical standards when evaluating it. Writers of literature reviews are subject to similar tendencies, which can bias their results and conclusions. Such biases are especially likely when a conclusion accords with prevailing wisdom or seems politically correct. Hence it is important to guard against these tendencies as much as possible.

One device is the deliberate search for exceptions and counterexamples. Most of your work in putting together a literature review is probably devoted to seeking positive examples that support the pattern or theory you are describing (your take-home message). The approach of looking for confirming examples is however what produces the infamous “confirmation bias,” in which people selectively attend to evidence that supports their conclusion and overlook contrary evidence (e.g., Darley & Gross, 1983). To overcome this bias, you should spend some time late in the project searching for any sort of contrary evidence. That is, once you have your general conclusions in mind and have formulated your take-home

message, stop and ask “Is there any evidence that anyone might interpret as contradicting that conclusion?” You may even be moved to look in some new places for relevant evidence.

Devoting a small section toward the end of your paper to a deliberate search for contrary evidence has several advantages. First, it will help you find such evidence, which might require you to temper or qualify your conclusions. Second, it will make your overall presentation more accurate. Third, it will make it more convincing to readers, because if they see you have exerted yourself to examine both sides of an issue, they will be less likely to assume that your approach was biased or selective.

Fourth, this section may even help you develop a more sophisticated, complex, and interesting (and probably more accurate!) theory. For example, in my literature review on erotic plasticity (Baumeister, 2000), I had reached the general conclusion that female sexuality is more responsive than male sexuality to a variety of social, situational, and cultural factors. A deliberate search for possible exceptions led me to find a handful of findings that pointed in the opposite direction. When I lumped them together, I noticed that they all involved early childhood experiences. Hence I revised my general theory to say that male sexuality seems to go through a period of plasticity during childhood, when environmental influences and experiences can have a significant effect, but starting at adolescence male sexuality remains fairly constant whereas female sexuality continues to respond and develop. Thus, focusing on exceptions helped develop a better and more balanced theory.

### **Tell Them Where to Go**

A good literature review should nearly always contain some statements about what are the priorities for future research. Normally these will occupy a subsection in the General Discussion. By this point you will have presented and criticized the available evidence and then summarized the main conclusions. You have told the reader what segments of the evidence are strong and which ones are weak or ambiguous.

It is therefore not difficult to extend your discussion by saying what you think researchers should focus on during the next decade or so.

Thus, you may conclude that some issues have been resolved and no further research is needed. This is helpful to prospective researchers so that they will not waste their time continuing to prove things that are already well established. On other matters, however, you may conclude that the evidence suffers from serious flaws, and so further work may be directed to try to remedy those problems. You might even suggest what methodological improvements or controls are needed in further work. On yet other aspects of the issue, evidence may be sparse, and so you would call for more studies of the topic.

In my experience, editors nearly always expect a literature review to include some recommendations for empirical research. After all, a literature review is republishing information that has already been published, and so it needs to serve some additional function beyond reporting what has already been done. Helping to guide empirical researchers as to what they should do next is one such valuable service. Indeed, it may help your paper get cited. Researchers may justify their investigation by saying that your review highlighted the need for precisely the kind of study they are doing.

When you have completed a literature review, you are in an unusual position of having a broad grasp of a great deal of information. You may have a perspective that gives you an overview of an entire field of work. No one else has that same perspective unless he or she is willing to do all the reading you have done. Hence it is valuable for you to use that perspective to say what you think should be emphasized in further research. Even though it may seem obvious to you that one question is definitively settled whereas another issue needs plenty of more and better research, it is worth saying so explicitly.

### **Matters of Style**

Your literature review can be more effective if it follows several guidelines for style and presentation. One of these is to be careful and scrupulous

about what you mean when you make a statement followed by a name and date in parentheses. In particular, it is vitally important to maintain a distinction between what someone may have said vs. what someone showed or proved on the basis of strong data. In your literature review, you probably want to cover both what people may have said by way of theorizing and what researchers have shown with empirical findings. Unfortunately, the format for citing someone is the same in both cases. As a literature reviewer, the responsibility falls on you to make the difference clear.

To some extent, this problem of confusing assertion with proof can be minimized if you follow my earlier advice to describe the methods and results of studies (instead of merely their conclusions). I recommend going a step farther, however. When you wish to cite someone's assertion that was in the form of a theory, speculation, casual observation, clinical impression, or the like, say so! Thus, instead of saying "Women are nicer than men (X, 1982)" you should say something along the lines of "X (1982) speculated that women are nicer than men" or "Based on her personal experiences, X (1982) concluded that women are nicer than men." The crucial point is to prevent readers from confusing such a statement with an empirical finding such as "In a carefully controlled study with young adult college students, X (1982) showed that women were nicer than men insofar as the women were more friendly and tolerant toward a newcomer who did not know how to behave."

My suggestion to indicate precisely what a given previous author had done seemingly runs counter to Bem's (1995) injunction that names of researchers should always be in parentheses rather than serving as the grammatical subject of a sentence. Bem recommended that authors should focus on the research findings themselves rather than the researchers. Although I agree with the general attitude behind Bem's comments, I do think there are many circumstances in which it is helpful, even necessary, to take the name outside the parentheses. Indicating that someone said rather than proved something is just one important instance. Another important and obvious one

is when you are discussing disagreements among previous writers or findings. Yet another is when you are summarizing views with which you disagree.

Generally, though, you should avoid letting the names play too prominent a role in your writing. One rule of thumb is never to start a paragraph with a name. When you start with a name, you have effectively neglected any transition, and the reader does not know how the new paragraph fits into your evolving argument. Graduate students who write their first literature reviews are particularly prone to starting paragraphs with names, because they tend to cover the published works one at a time and devote a paragraph to each one. That style of writing is very hard to read, however, because the reader has to figure out what the continuity across paragraphs is and where the line of evidence is supposed to lead. Use the first or last sentence of each paragraph to connect with your take-home message.

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## Conclusion

The psychology journals contain the diligent efforts, indeed in many cases the life's work, of thousands upon thousands of researchers. This is an immensely valuable stock of information, but it exists in a state of near anarchy and chaos, with articles on the same topic scattered across different journals and different years, while the same issue of one journal will contain pieces that have nothing in common.

To help the field cope with such a mass of unorganized information, literature reviews serve valuable purposes. They bring together the information that is otherwise dispersed in many places. They summarize and integrate many individual findings, permitting much stronger and more confident assertions about which ideas are correct and which are false. They can address broad, integrative questions that single empirical papers cannot. They can propose broad theories and evaluate them against a diverse assortment of work. Literature reviews seem destined to play an ever-increasing role in psychological science, as

experts want to have reliable answers to broad questions and as it becomes ever more difficult to cope with the burgeoning mass of information.

Although this chapter has focused on the difficulties, dangers, and pitfalls of writing literature reviews, let me close by saying a few words about its pleasures. Writing literature reviews can be fun as well as deeply satisfying. They are certainly not for everyone, but for some they are ideal. It is, after all, nice to be able to work with other people's published data rather than always having to struggle with your own! More important, literature reviews permit you to tackle broad questions that have a resonance and intellectual stimulation that goes beyond what can be addressed in a single empirical paper.

From my own perspective, a special appeal of literature reviews is that they allow you to study different questions, and so they increase the breadth and diversity of your thinking. To collect data on a new problem typically requires a new set of skills, and so it is difficult to collect data on very many new topics. (That is why most laboratory-oriented researchers devote their entire careers to a small set of issues and questions.) But to write a literature review on a new topic involves the same set of skills, namely reading and thinking and discerning patterns, or possibly meta-analysis. Once you have mastered how to write a literature review, you can move from one interesting question to another fairly easily, and you are on your way to a very interesting career and life.

Another benefit of literature reviews is that they are often quite influential. The large citation-tracking engines (e.g., Google Scholar or the Institute for Scientific Information) allow researchers to see which of their papers have been included in the Reference sections of other journal articles. Periodically I check what they have on my work, as a way of seeing which papers are being found useful and influential by other scientists. Invariably, my most heavily cited papers are my literature reviews, rather than my reports of experiments. I suspect this is a general pattern, though I cannot prove it. Still, if that is true for you, it helps to realize that literature reviews may be a valuable way to reach a broad audience and

influence the field in a way that is even more powerful than writing up experiments.

As I have said, writing literature reviews is not for everyone. It is activity best suited to people who are good at spotting patterns in large masses of information, who like to write and think (perhaps more than they like to collect and analyze data), who enjoy thinking about broad questions, and who have many different interests.

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