chapter 3 ·······································

Introspection I: Methods and Limitations

> *Introspective Observation is what we have to rely on first and foremost and always.* The word "introspection" need hardly be defined—it means, of course, the looking into our own minds and reporting what we there discover. *Everyone agrees that we there discover states of consciousness* [i.e., thoughts and feelings] (William James 1890/1983, p. 185).

Introspection—or the introspective verbal report—is used in one form or another in virtually all research on consciousness or aspects of conscious experience, such as perception, mental imagery, and so forth. Introspective reports are also used in psychotherapy and in everyday communications between people who are trying to describe how they feel or explain their own behavior. Philosophers and novelists, as well as psychologists, have drawn profound conclusions about human nature from their personal introspections.

In William James's day, introspection was psychologists' primary means of studying consciousness and the mind. Indeed, James (an American) and most British psychologists did not distinguish between consciousness and the mind. They thought that introspection was a general method for studying mental processes (Danziger 1980). Now we know—as many German psychologists suspected even in James's day—that many mental processes are nonconscious, and are not available to introspection. Since 1890 a variety of more objective methods of studying psychological processes have been developed, and introspection has gone through a cycle of being distrusted

and rarely used during the Behaviorist era (roughly 1913 to the early 1960s), to return to frequent but cautious use in the present day. As we will see, introspection has some severe limitations as a means of studying mental processes. But it is still the best method we have for learning about a person's stream of consciousness.

Because introspective reports are so important for the research discussed in this book, it is important to give, early on, an overview of the types and methods of introspection and their limitations. In addition I will consider the question of what is really going on during introspection. Is it really a matter of "looking within?"

INTROSPECTION AND INTROSPECTIVE VERBAL REPORTS

First we need to distinguish between introspection and introspective verbal reports. In the spirit of William James and common usage, let us tentatively define *introspection* as "looking into one's own mind and observing its contents." In other words, introspection is observing your conscious experience. An *introspective verbal report* (IVR) is a verbal description of your conscious experience. For example, suppose you were riding an elevator with an attractive stranger, and suddenly he or she grabbed you and kissed you. You would have certain physical sensations and emotional feelings—either pleasant or unpleasant—and certain thoughts, such as deciding whether to push the stranger away or kiss him or her back, and follow-up thoughts, such as "Could this get serious?" If you then think to yourself, "What am I sensing/feeling/thinking?" and look within to find the answer, you are introspecting. That is, you are observing your conscious experience. You may also ask yourself *why* you are sensing/feeling/thinking as you are. Such thoughts are *interpretive introspections*. If you subsequently try to describe your subjective experiences to someone in words, then you are making an introspective verbal report. (For brevity I will use the term introspection rather than introspective verbal report when it is obvious from the context that I am talking about introspective verbal reports.)

It is important to bear in mind that characterizing introspection as "looking within" is merely a metaphorical description of the introspective process. It is *as if* one is looking within. But as we will see, it would be incorrect to explain the process of introspection as literally a matter of looking within or of internal observation, as if it was closely analogous to visual observation of something outside of ourselves. In terms of the levels-of-consciousness model that I described earlier, introspection is a case of reflective consciousness. It is thinking about one's conscious experience. The initial "raw" experience is a matter of primary consciousness.

Introspection or inner observation is an everyday occurrence for most people.[1] Just as attention to external stimuli is selective, introspection is selective. You select what is relevant to your purpose at the moment. Most introspection and reporting is informal, with little attempt at precision. In psychological research, however, people may be asked to do formal intro-

spection, in which they try to introspect in a systematic manner and report their inner observations as precisely as they can.

Introspective reports versus ordinary verbal responses.

Introspective verbal reports (IVRs) are a type of verbal behavior. We should distinguish IVRs from ordinary verbal responses. Verbal responses are the primary data in a wide variety of psychology experiments. For example, people answer questions "yes" or "no"; they name what they see (such as "triangle" or "circle"); and they report lists of words recalled from memory.

It is not possible to draw a fine line between introspective verbal reports and ordinary verbal responses. In general, ordinary verbal responses are responses to the primary cognitive task of an experiment (for example, tasks requiring perception, memory, judgment, or decision making). Verbal responses may be simple behavioral outputs from mental processes. They could in most cases be replaced by simple mechanical responses, such as pushing one of two or more buttons labeled by appropriate words.

In their analysis and theoretical discussion of ordinary verbal responses, researchers usually disregard the question of whether the verbal responses indicate anything about conscious contents. If consciousness is considered at all, usually there is an assumption of *concordance* between behavior, mental processes, and conscious experience (Tulving 1989). Ordinarily, responses in visual discrimination tasks follow from consciously perceived differences between objects. And reports of remembered information ordinarily follow from memories recalled into consciousness. However, the assumption of concordance has rarely been tested. As we will see in Chapter 6, there are some cases, such as "blindsight" and subliminal perception, in which concordance breaks down and behavioral responses and conscious awareness become dissociated from each other.

When subjects perform cognitive tasks and make ordinary verbal responses, experimenters are mainly interested in the question of how accruately subjects process information, rather than in their conscious experience of the information. On the other hand, introspective verbal reports are intended to be reports on the subject's conscious experience *per se*, including reports on conscious contents and mental processes related to the task at hand, and on daydreams—thoughts unrelated to the task at hand.

Ordinary verbal responses have been accepted without question in psychological research. Introspective verbal reports, on the other hand, are highly controversial as a type of data. There are two reasons why introspective reports are controversial. First, some psychologists, especially radical behaviorists such as B. F. Skinner (1987), believe that consciousness is a mere epiphenomenon—that it plays no role in causing people to behave the way they do. Thus, in their view, introspective reports on conscious experience are unimportant. Second, even for psychologists who believe that conscious experience plays a role in controlling behavior, there is the problem that introspective reports are often inaccurate and unreliable. Errors may occur in both the recall and the reporting of conscious experiences.

In Chapter 7, "Introspection II," we will consider in some detail the

question of whether introspective reports on conscious experience provide useful information about underlying mental processes and the causes of behavior. But aside from that issue, conscious experience is an important phenomenon in its own right, and introspective reports are critically important for finding out about people's conscious experiences. Introspective reports can be useful for some purposes, if we understand the various factors that affect their accuracy and reliability. Next I will describe three types of introspection, followed by a discussion of the limitations of introspective reports.

TYPES OF INTROSPECTION

We can distinguish three types of introspection—analytic, descriptive (phenomenological), and interpretive—in terms of what they attempt to describe or explain.

Analytic introspection. Analytic introspection—sometimes called "classical introspection" (Boring 1953)—involves attempting to describe one's conscious experiences in terms of their elementary constituents. Analytic introspection was advocated by Edward B. Titchener (1867–1927), a professor at Cornell University. Titchener developed an approach to psychology called *structuralism*, based on a model borrowed from chemistry. Titchener believed that conscious experience is constructed from a limited number of "elements" of sensory experience and simple feelings, and that these elements can be discovered through introspection. More complex percepts and ideas are the "molecules" of experience.

Titchener taught that it was important for introspecting subjects to avoid the *stimulus error* of ascribing meaning to their experience, that is, confusing the complex percept (the molecule) with its sensory elements. For example, while observing a table across the room an observer might describe his or her experience as a visual sensation of a quadrilateral form (not a rectangle, since the retinal image of a table viewed from the side is quadrilateral—a "rectangle" is a higher-order perception), shading from grey to white (according to how light reflects from its surface), with columnar appendages (the legs) hanging from three corners (only three legs are visible from the observer's position) at such-and-such angles, and so on. An observer who said "I see a table" would be committing a stimulus error, according to Titchener, though such a report would be perfectly acceptable for a researcher who was interested in phenomenological reports. In order to minimize the stimulus error, Titchener used rigorously trained introspective observers rather than experimentally naive subjects.

Analytic introspection is rarely used today, for four reasons. First, its theoretical foundation has been discredited. Max Wertheimer and other Gestalt psychologists in Germany argued convincingly that—contrary to Titchener's claims—objects are perceived as unified configurations rather than as sets of elementary sensations: "The whole is more than the sum of its parts." Also, Oswald Külpe and his colleagues at the University of Würzberg, Germany, discovered "imageless thought." When asked to introspect and report on the mental events that occurred while they solved a problem, sub-

jects described a sequence of thoughts or images, each one leading closer to the goal. The subjects were not, however, consciously aware of any process that guided the sequence and accounted for the transformations between one thought and the next. Ach coined the term "determining tendency" for the nonconscious process that guides thinking. Determining tendencies can be established by prior instructions (Ach 1905, cited in Lieberman 1979). If thinking can occur without any accompanying conscious sensations, then elementary sensations cannot be the basis for all complex thoughts.

A second problem was that analytic introspection was unreliable, with different observers giving different reports under ostensibly the same conditions. Third, it was largely sterile, for it led to no understanding or practical applications regarding complex thinking, motives, emotions, and overt behaviors. Fourth, following John Watson's introduction of Behaviorism in 1913, young psychologists had an alternative to Structuralism and analytic introspection that promised much more in the way of practical understanding and applications. Thus, analytic introspection largely disappeared from the psychology laboratory after the death of Titchener in 1927 (Boring 1953; Danziger 1980).

Descriptive introspection.
Descriptive or phenomenological introspection is the simplest and most natural type of introspection. It is simply the description of one's conscious experience in natural language terms. It asks "*What* did I perceive/think/feel?" It concerns meaningful events, objects and people, and thoughts about them, rather than abstract generalizations or unnatural analyses of objects into their sensory elements. Descriptive introspection can be about dreams and daydreams as well as about real perceptions and actions.

Although descriptive introspection is concerned with immediate experience, it is not the immediate experience *per se*. Descriptive introspection is one step removed from the immediate experience. While immediate experience is primary consciousness, descriptive introspection is a matter of reflective consciousness. It asks "What am I experiencing?" or "What did I experience?", trying to consider the experience objectively, perhaps to prepare for verbally reporting it. Descriptive introspective reports describe conscious experiences in everyday language as closely as possible to the way we originally experienced them. Descriptive reports necessarily involve categorizing one's experiences (insofar as descriptive words are category labels), but they include no analysis or interpretation of their causes.

Interpretive introspection.
Interpretive introspection is introspection intended to discover the causes of our thoughts, feelings, and actions. While descriptive introspection asks "*What* do I feel?", interpretive introspection asks "*Why* do I feel this way?" Where descriptive introspection asks "*What* did I do?", interpretive introspection asks "*Why* did I do that?" In interpretive introspection we attempt to discover the *antecedents* of our thoughts, feelings, and actions, such as relevant prior events and thoughts. As we will see in Chapter 7, some psychologists dispute the validity of interpretive introspection (Nisbett & Wilson 1977). That is, they doubt that we can know the

causes of our own thoughts, feelings, and actions through introspection alone.

The distinction between descriptive and interpretive introspection seems clear enough when we are dealing with perceptual or quasi-perceptual (mental-image) experiences. However, there are some cases in which the distinction between description and interpretation of conscious experiences is not so clear. Are reports of our mental states—such as attitudes, motives, hopes, desires, and intentions—to be accepted as simple descriptions of immediate conscious experiences? Or are such reports really inferences, based on our interpretation of the situation and what we have done? For example, is love a directly felt conscious experience, or is it an inference, based on how we behave when we are with the loved one, and how we think about this person when he or she is absent? This is a complex issue (Wilson 1985). My distinction between descriptive and interpretive introspection is based on people's intentions when they introspect—whether they are to describe their conscious experiences in a relatively straightforward, naive way, or to attempt to interpret the causes of these experiences. By this criterion, attempts to report mental states such as attitudes and intentions are classified as descriptive introspection, whereas attempts to explain those states are classified as interpretive introspection.

LIMITATIONS OF INTROSPECTIVE VERBAL REPORTS

Here we are concerned mainly with descriptive (phenomenological) introspective reports by normal adults. Suppose that you were asked to describe your conscious experiences—perceptions, thoughts, images, feelings—over, say, the last five minutes, without attempting to analyze or interpret them. There are several factors that could limit the accuracy of your report.

Forgetting.   Forgetting is the most important factor that limits the accuracy of introspective verbal reports. Conscious experiences may be forgotten within a matter of seconds or minutes.

Ericsson and Simon (1980) described the verbal report process in terms of the multistore model of memory. In this model, only the contents of short-term memory (STM or working memory) can be verbally reported. STM holds information currently undergoing controlled (flexible, volitional) processing; one is consciously aware only of information that is undergoing such processing. STM has a very small capacity (about seven items), and its duration is only a few seconds except when its contents are maintained by rehearsal. Information is easily lost from STM through interference caused by distraction or by the surpassing of STM capacity by current thinking or memory demands. Some conscious STM contents may be transferred to long-term memory (LTM), depending on factors such as their salience (that is, their conspicuousness, due to such factors as loudness, novelty, surprise, or emotional impact), and the amount and type of rehearsal or thinking about them that you do while they are in STM. In order to report experiences that occurred more than a few seconds after you were last aware of them, you would have to recall them from LTM.

Thus, according to the multistore model, you can report conscious contents under one of two conditions: (1) the contents are still available in STM; or (2) they have been transferred to LTM and can be retrieved from LTM into STM.

Verbal reports of events will be inaccurate or incomplete under any of four conditions: (1) You never attended to the event, so it was not stored in STM and is not available for verbal reports. For example, if you are attending to a task, such as reading, you might not consciously notice a voice speaking softly nearby. (2) The information is in STM and potentially available for verbal reporting, but for some reason you do not report it. Failure of reporting, or incomplete reporting, might occur because you are too busy doing some other task, or because you are withholding the report to protect your personal privacy (for example, you might not report a potentially embarrassing daydream). (3) The information was at one time in STM but was not transferred to LTM. For example, you might briefly notice something—such as a dog on the curb as you drive by—but it is so trivial that you immediately switch your attention to something else, so the event (dog) is lost from STM and not transferred to LTM. (4) The information is in LTM but you cannot retrieve it into STM for verbal reporting.

Ericsson and Simon's analysis has several implications for research methodology: (1) Verbal reports on conscious experiences will be most accurate if they are collected within a few seconds of the original experience, while the information is still in STM. Retention in STM will be best under conditions that minimize interference. (2) Where longer delays in reporting are necessary, accuracy will be greatest under conditions that increase the likelihood that the experience will be transferred to LTM. These conditions include: (a) foreknowledge that the experience is important and that a report will be requested; (b) unique and inherently interesting experiences that would be spontaneously stored; (c) the experience occurs at a time when STM information-processing demands are low, so there is time for mnemonic storage processes to operate.

Reconstruction errors. Reports on episodic memories—long-term memories of personal life events—are not based on a detailed videotape-like replay of the original event. Rather, the report is a *reconstruction* of the original event, based partly on factual recall and partly on filling in the gaps with plausible details (Ashcraft 1989). The same principle applies to recall of conscious experiences, regardless of whether they concern overt actions or dreams, daydreams, or other thought processes. Two types of reconstruction errors can occur: (1) people may report more than they accurately recall, by filling in memory gaps with plausible fabrications; and (2) the memory report may be more orderly than what was really recalled. For example, you might describe a dream as if you are telling a connected, coherent story, when in fact the dream was quite disorderly and you recalled only part of it. Reconstruction errors can occur in reports on either STM or LTM contents, though they are likely to be greatest in LTM recall.

Verbal description difficulties. Some conscious experiences cannot be adequately described in words. For example, you probably cannot describe

in any detail the feelings that go with strong emotions (love, fear), or novel sensations such as pains, tastes, and odors. Experiences that cannot be described in words are called *ineffable* experiences, though this term is applied most commonly to mystical religious experiences. Of course ineffability is a matter of degree; some experiences can be described better than others. Sometimes we have to resort to metaphors and similes. For example, in describing a headache you might say "It feels like my head is being crushed in a vise." People differ in their verbal descriptive skills, and poets will likely be better than engineers at describing their subjective experiences. The problem with metaphorical descriptions is that they do not communicate precisely. They may mean different things to different people. The problem of verbal description difficulties may be partially overcome by training subjects to use special vocabularies to describe their subjective experiences.

Distortion through observation.   In atomic physics, one cannot know both the velocity and the position of an electron at the same time, because the process of observing an electron's position with high-energy light waves changes its velocity. This discovery led to the formulation of the Heisenberg Uncertainty Principle, which says that the process of observation may alter the thing that is being observed. An analogous *Introspective Uncertainty Principle* applies in psychology: attempting to introspectively observe one's conscious contents may change the contents that are being observed. For example, if you introspect on your thoughts while you solve a difficult problem, you may try to attend and store in memory more details than usual, thus causing the thought process to go slower and perhaps take a different course than it otherwise would. If you try introspectively to judge the frequency of a certain type of thought—such as aggressive thoughts, or guilty thoughts— then the frequency of that type of thought might be altered by the introspective process. (A demonstration: For the next ten minutes, try to avoid thinking about pink elephants. But count the number of times that you think about pink elephants over the next ten minutes.) If research subjects know that they will be asked to report their thoughts, as in experiments on daydreaming, then they may try to inhibit thoughts that they would be embarrassed to report.[2] Thus, if researchers want to minimize distortion through observation, they must ask for *retrospective* reports, without giving subjects any advanced warning. (Retrospective reports, on the other hand, are plagued by the problem of forgetting. No method is perfect.)

Censorship.   Sometimes people choose to keep secrets. This is a minor problem in most cases. But in studies of daydreams, subjects may be reluctant to reveal embarrassing thoughts—for example, sexual or aggressive thoughts about the experimenter. Subjects may give false reports or claim that they do not recall anything. To reduce this problem, researchers can ask for reports on the general nature of the conscious experience without asking for details. For example, subjects can classify thoughts into labeled categories.

Experimental demands.   Introspective verbal reports are overt behaviors, and they may be influenced by a variety of factors that also affect other

overt behaviors. Among the factors that can affect people's behavior in psychology experiments are the demand characteristics. The *demand characteristics* of an experiment are the situational cues from which subjects try to figure out what the experimenter expects them to do (Orne 1962). Subjects may try to be helpful and do what they think the experimenter expects them to do. Thus, their verbal reports may be altered directly through deliberate exaggeration or distortion, or indirectly by trying to produce subjective experiences of the expected type and then accurately reporting them. For example, suppose you were a subject in an experiment on dreams. Before you go to sleep you are asked to watch a movie about a soldier's frightening wartime experiences. You might assume that the experimenter expects that the movie will influence the content of your dreams. Then in your subsequent dream reports you might exaggerate the frightening nature of your dreams, or selectively report only the unpleasant dreams, in order to help the experimenter confirm his or her hypothesis. The problem is that the experimenter's hypothesis would be confirmed artifactually, as a result of the effects of experimental demands on your verbal-reporting behavior, rather than as a result of the true effects of the movie on your dreams.

Lack of independent verification.   In studies using introspective methods, we may say that subjects observe their conscious experiences, then report their observations to the researcher.[3] But researchers have no way to independently check on the accuracy of subjects' reports. For example, I could not check on the accuracy of your dream report, or of your description of the thoughts you had while trying to write a poem.

That observations can be independently verified by others is a fundamental principle of scientific research, and the fact that introspective observations cannot be independently verified is the major reason why introspection has been rejected as a research method by many psychologists. However, this problem is not as serious as is sometimes supposed. Researchers can make reasonable judgments about the accuracy of introspective reports by considering: (1) their consistency with other reports, by the same person or other persons, made under similar conditions; (2) their consistency with other behavioral evidence, such as facial expressions, eye movements, or physiological measures; and (3) their consistency with specific theories about the mental processes that occur in the situation under consideration.

Substitution of inferences for observations.   A special type of error sometimes occurs when people are asked to do interpretive introspection, to explain the causes of their behavior or feelings. When people do not have direct introspective access to the stimuli or mental processes that caused their feelings or behavior, they may make plausible inferences, using whatever information is available. Such inferences are heavily influenced by people's *a priori* theories about the causes of human actions (Nisbett & Wilson 1977). For example, if you were to eat very rapidly, devouring a hamburger in four bites, and someone asked you "Why did you eat so fast?", you might reply "I was very hungry." In fact, you might have a habit of eating rapidly all of the time, regardless of how hungry you are. You don't know

why you eat so rapidly, but it seems reasonable to attribute it to great hunger. (I'll go into more detail on the problem of introspective access to the causes of our actions, and the problem of substituting inferences for observations, in Chapter 7.)

   Conclusion.   Psychologists have to keep in mind two aspects of introspective verbal reports. First, they are behavioral data, and all behaviors are influenced by a variety of causal factors. Second, they are attempts to accurately describe subjective experience. Numerous factors may prevent verbal reports from accurately or completely describing conscious experience. However, the topic of conscious experience is too interesting and important for it to be ignored merely because of difficulties in studying it.

METHODS OF OBTAINING INTROSPECTIVE REPORTS

Several methods of obtaining reports on conscious contents have been used in psychology research (Ericsson & Simon 1980; Klinger 1978). Each method has its good and bad points. Which method is best depends on the specific question under investigation. You will encounter research based on these methods throughout this book.

   Thinking out loud.   In the thinking-out-loud method, subjects make a continuous verbal report on conscious contents while they are in a particular situation, for example, solving a chess problem, or relaxing with their eyes closed. The advantage is that the researcher can obtain a lot of detailed information about the stream of consciousness, with relatively little loss due to forgetting. The disadvantage is that both the introspection process and the verbal reporting may alter the flow of conscious experience. For example, the flow of your daydreams would be less spontaneous than normal if you had to describe them as they occurred (Pope 1978). The thinking-out-loud method has, however, been popular in research on thought processes that occur during problem solving. Ericsson and Simon (1980) argued that thinking out loud does not affect ongoing thought processes during which subjects can make a direct report of ongoing verbal thoughts. Thought processes may be slowed if people have to use words to describe nonverbal experiences, such as visual-mental images. Thought processes may be altered if people have to attend to information to which they would not ordinarily attend—for example, in trying to describe their thoughts step-by-step while solving a problem. In some cases thinking out loud actually improves performance on cognitive tasks, perhaps because it gets people to attend to relevant information that they might otherwise overlook.

   Thought sampling.   In thought sampling, subjects are instructed that whenever a designated signal (such as a brief tone) occurs, they are to report what they were thinking at the moment that the signal occurred. Then they go about their activities in a (presumably) normal way until the signal occurs again at some unpredictable time. While thought sampling does not yield as much detailed information about the stream of consciousness as thinking

out loud does, thought sampling causes less distortion of the normal progression of thoughts. Since the sampled thoughts are reported immediately after they occur, the reports come directly from short-term memory. Depending upon the purposes of the experiment, thought samples may be either brief verbal narrative descriptions, responses to brief questionnaires, or nonverbal responses (such as pushing a button to classify the thought into one of several prearranged categories). Thought sampling is used in laboratory research on dreaming, when experimenters periodically awaken subjects to obtain dream reports.

Retrospective reports.   Whereas the thinking-out-loud method and the thought-sampling method are used for studying the ongoing stream of consciousness, retrospective reports are used to collect data about thoughts that occurred on a specified previous occasion in reference to a specified previous event. For example, subjects might solve a problem that requires creative thinking, then afterward try to recall and report their thoughts that led to the solution. Or they might respond to particular stimuli (words, pictures), then later try to recall the thoughts that preceded their responses. Retrospective reports may be either verbal narratives or responses to prepared questionnaires.

The advantage of retrospective reporting is that it does not interfere with ongoing thought processes during the main task, particularly if subjects do not know in advance that they will be asked to make an introspective report. But forgetting may be a serious problem with the retrospective reporting method. This problem will be greater the more time that elapses before the report. Retrospective reporting may be especially susceptible to the problems of reconstruction errors and of substituting inferences for observations. In dream research, the retrospective reporting method is used when subjects record their dreams upon awakening in the morning.

Event recording.   Researchers and psychotherapists use event recording when they need to know how often a subject (or client) has a particular type of thought, but they do not need to know the full range of thought contents. In event recording, the subject notes each occurrence of the designated type of thought (such as anxiety or aggression thoughts). The thought events can be recorded in a notebook or on a tape recorder. Usually a brief notation of the time and place is sufficient; detailed reports are not usually required. In the laboratory subjects can report simple thought events by pushing buttons, with precise time records being kept automatically. Event recording is useful for tracing changes in the frequency of a particular type of thought. For example, a therapist might collect data about the frequency of anxiety thoughts before, during, and after a treatment program. Event recording has the advantage of reports being made from short-term memory rather than long-term memory, though subjects may sometimes forget to record pertinent thoughts. Knowing that one is supposed to report a certain type of thought may initially affect the frequency of such thoughts, though this problem will decrease after an adaptation period.

Diaries.   Diaries are written narrative reports on one's activities and thoughts, in which entries are made periodically over a period of several

days, months, or years. Diaries can provide abundant useful information about individuals over a long period of time, for example, about the thought processes of creative thinkers. Diaries are necessarily very selective in what they report. Ordinary diaries may be quite unsystematic, especially when entries are made at irregular time intervals and express different types of thoughts and experiences on different occasions, depending on the individual's shifting interests and current concerns. Besides being selective and unsystematic, diaries are subject to the problems of forgetting and reconstruction errors. Because diaries consist of unsystematic reports made under uncontrolled conditions, they are not useful for rigorous testing of research hypotheses. However, a good feature of diaries is that they are open-ended; people are not constrained by a particular questionnaire format, so they can report anything that happens. Thus, for researchers, diaries can be valuable for showing the range of possibilities for human conscious experience, and they may be a rich source of ideas that can be tested with systematic research. The usefulness of diaries for systematic research, such as dream research, can be increased by teaching subjects to keep systematic diaries.

Group questionnaires.   With group questionnaires the purpose is to get a lot of data from a lot of people as quickly and cheaply as possible. Group questionnaires have been used, for example, to find out about the frequency of different types of contents in night dreams or daydreams. The questions are usually of the multiple-choice, true-false, or percentage-estimation types, that yield quantitative data that can be scored and analyzed by computers. (For example, about what percent of your daydreams are about sex? About financial problems? About acts of violence?) Questions are chosen on the basis of prior research and/or theoretical hypotheses. Group questionnaires are useful for comparing groups of people, based, for example, on gender or age or socioeconomic status. However, they have serious disadvantages, particularly the problem of forgetting. Also, they are closed rather than open, in the sense that people can give only responses that fit the question-and-response formats on the questionnaire. When they use questionnaires, researchers cannot discover anything that is totally different from the possibilities that they had anticipated.

THE PROCESS OF INTROSPECTION

Earlier I provisionally defined introspection as "looking within one's own mind and observing its contents." I pointed out that this is simply a metaphoric description of introspection. What is really going on during introspection?

What Introspection Is Not

It will be easier to explain what introspection is if we first consider what introspection is not (Lyons 1986). First, though introspection concerns conscious contents or experiences, *introspection is not equivalent merely to hav-*

ing conscious experiences. Recall the distinction between primary consciousness and reflective consciousness (Chapter 1). Introspection is an act of reflective consciousness. It attempts objectively to describe, identify, and interpret our primary conscious experiences. But *introspection does not deal with all conscious experiences.* Most primary conscious events are so fleeting that they are immediately forgotten and are not available for introspection. Introspection is not like a videotape replay of our conscious experiences. Introspection is selective, and it is limited by gaps and distortions of attention and memory.

Second, *introspection is not a sensory process.* There is no introspective organ that stands apart from consciousness and observes it. Unlike the sensory modes of vision, hearing, and so forth, introspection does not have any unique sensory qualities. Rather, though it can deal with the senses, it is mainly a matter of verbal thinking. Furthermore, to conceptualize introspection as a sensory-perceptual process is similar to the *homunculus fallacy,* that there is someone (a homunculus or little person) inside of your brain who observes your conscious experience and then reports it. The problem with the homunculus is that you then have to explain how the homunculus could observe your consciousness—so you end up with an infinite regression (a homunculus inside the homunculus, and so forth).

Third, *introspection is not a brain scanner.* A strict materialist- or identity-theory view of the mind/brain relationship says that mind and brain are one. Thus, it might be inferred that introspecting consciousness is really introspecting brain processes. Introspection has been equated with a specialized "brain scanner" that scans the parts of the brain that produce conscious experience (Armstrong 1968). But subjective conscious experience and objective neurophysiological observations are two different perspectives on the brain, and you cannot see one type of phenomenon from the opposite perspective. Introspective reports describe conscious experiences, not brain processes (Lyons 1986).

Fourth, *introspection is not simply the making of inferences about our mental states, based on our overt behavior.* From a behaviorist viewpoint, it has been claimed that an introspective report of a felt desire for something is really just an inference. A "desire" is nothing more than a tendency to do things that lead to certain goals (food, sex, achievement, and so on). We infer that there is a mental state—a "desire"—that produces our goal-oriented behavior. Though I do not deny that introspective reports are influenced by inferences, I argue that some conscious contents or experiences are immediately given and available to descriptive introspection, without inference. For example, desire has components of thoughts, images, and feelings, as well as behavior.

Fifth, *introspection is not direct inner observation.* This point is rather subtle, but important. Direct inner observation of ongoing thinking is impossible, according to the nineteenth-century French philosopher Auguste Comte. By analogy to the fact that you cannot directly see your own eye, Comte argued: "The thinker cannot divide himself into two, of whom one reasons whilst the other observes him reason. The organ observed and the organ observing being identical, how could observation take place?" (1830, pp. 34–37 cited in James 1890/1983, p. 188).

Franz Brentano (1874), an Italian-German psychologist, had a similar

opinion. He distinguished between the ideas of *Selbstbeobachtung* (active self-observation) and *innere Wahrnehmung* (passive inner perception). (James characterized *Wahrnehmung* as "the immediate feltness of a feeling," [1890/1983, p. 189]. It apparently is the same as what I call primary consciousness.) Brentano argued against the possibility of active self-observation (*Selbstbeobachtung*). He said that we cannot directly observe our ongoing conscious experiences "because in doing so we would thereby draw away the attention necessary for the existence of the first-order mental life of thoughts, feelings, and volitions. To attempt direct inner observation therefore was *ipso facto* to diminish or destroy what one was attempting to observe" (Lyons 1986, p. 4).[4]

Now that we know what introspection is not, we are closer to understanding what it is.

What Introspection Is

Two principles are relevant to all types of introspection. First, introspection is a thought process—or a set of thought processes. It is an act of reflective consciousness. Introspection is, essentially, thinking about one's primary conscious experiences (including verbal thoughts, images, perceptions, feelings, intentions, and actions) for the purpose of describing and interpreting them. Introspection is not fundamentally different from other cases of descriptive and interpretive thought, except that the topic of introspection is one's own (primary) conscious experiences.[5] Second, the data of introspection come from memory. Strictly speaking, introspection is retrospection.

Descriptive (phenomenological) introspection is the most natural, straightforward type of introspection: the attempt to describe (to ourselves or to others) the contents of our stream of consciousness—our thoughts, feelings, and perceptions—without attempting to explain them or analyze them in any detail. Descriptive introspection is not a passive process—it is not the mere having of conscious experiences. Descriptive introspection is an active thought process, involving discriminating, classifying, and naming of experiences, and describing them, often with the help of metaphor or analogy.

The first problem for understanding descriptive introspection is to explain the nature and source of the data of introspection. In ordinary (nonintrospective) thought, the data come from both ongoing perceptions and memory of past experiences and conceptual knowledge. The situation is more complicated for introspection. Introspection is about our own (primary) conscious experience, but as Comte and Brentano explained, we cannot directly observe our ongoing conscious experience because the attempt to observe it directly would modify or destroy it.

So where do the data of introspection come from, in order that we may introspect without interfering with the thoughts that are introspected? As James (1890/1983) argued, the data of introspection come from memory. *Introspection is really retrospection:* observing (that is, thinking about) our remembered past conscious experiences. Introspection deals with either immediately past experiences retrieved from short-term memory, or more distant past experiences retrieved from long-term (episodic) memory.

Questions about introspection as retrospection.   In cases where we are introspecting—thinking about—conscious experiences that were clearly in the past, there does not seem to be any problem in interpreting introspection as retrospection. But you may ask, "If introspection is really retrospection, why does it seem that I can introspect and report on my *current* conscious experiences, such as my current thoughts, feelings, and perceptions?" Three comments are pertinent here.

First, the act of introspection is not the same as the experience that is introspected. For example, thinking in order to solve a problem is not the same as introspectively thinking about the problem-solving thought process. Nor is feeling an emotion the same as introspecting it, trying to classify and describe it. Introspection involves a temporary change in attitude toward conscious events, one in which we attempt to think about them objectively (reflective consciousness), rather than experiencing them in a simple, direct, natural manner (primary consciousness).[6]

Second, the illusion that introspection occurs concurrently with the introspected primary conscious experience arises because in many cases primary experience remains more-or-less constant over a period of time. This can occur because the conditions that produce the primary experience remain relatively constant. Thus, we can alternate attention back and forth between introspection and primary experience. Finding that the primary experience remains unchanged each time we return to it, we have the impression that we are introspecting concurrently with the primary experience. For example, a feeling of pain or anxiety might remain unchanged as we alternate between the primary experience and introspective thoughts about it.[7] Each period of introspection is a retrospection of the immediately preceding moment of primary experience.[8]

Third, current perception—at least visual perception—seems to be an exception to the claim that introspection is retrospection. If you want to make a descriptive introspective report on your current conscious perceptions, you don't have to rely on memory; you can just keep your eyes open and describe what you see. Lyons (1986) argued that it is not appropriate to speak of introspection of ongoing perceptions. Nor are verbal descriptions of perceptions equivalent to introspective reports. For example, you might report "I see a train," but it would be redundant to say "I am experiencing the sight of a train."

We can try, however, to distinguish between perceptions and introspection of perceptions. Conscious sensory perceptions are about things in the world: recognized objects, sounds, and so forth. Introspection is about conscious experiences. According to the constructivist theory of perception, when we are describing something that we currently perceive in the world we are, strictly speaking, describing our conscious experience and not the object or scene itself. (The constructivist theory says that our perceptions are interpretations of sensory inputs, based on our past experiences, assumptions, and expectations [Best 1989; Neisser 1975].) But for most practical purposes we can take a naive realist view and accept descriptions of perceived objects as descriptions of the objects themselves. Probably nothing is to be gained by thinking of such descriptions as introspective reports.

It is appropriate, however, to speak of introspection of perceptions in

certain cases: (1) Thoughts about ongoing perceptual experiences *as perceptual experiences* (in contrast to thoughts about the perceived objects) are introspective thoughts, for example, the attempts of the classical introspectionists to analyze perceptions into their sensory elements. Similarly, a painter analyzes a scene in terms of forms, colors, and light values. Of course, when you are in an analytic introspective attitude, you are not perceiving in a natural, naive way. [See Chapter 2, Endnote 2, on Gibson.] (2) Attempts to describe past perceptions, retrieved from memory, are cases of retrospective introspection. Describing what we saw and heard in the past involves more than simple memory retrieval: it also involves a large component of thinking, in which we must reconstruct our past experience based on the limited available data (Best 1989). More often than not, introspection of perceptions is concerned with past perceptual experiences—either immediately past (from STM) or in the more distant past (from episodic LTM)—not with ongoing perceptions.

Reconstruction and inference in introspection.   Conceiving of introspection as retrospection explains how we can describe our stream of consciousness without destroying it through the process of observing it. But accepting introspection as retrospection acknowledges that we can never give a completely detailed and perfectly accurate description of our conscious experiences. The data available for introspection are limited by: (1) incomplete storage, where selective processes determine which experiences are stored in short-term or long-term memory; (2) incomplete retrieval of stored information from memory; and (3) distortions when we try to reconstruct our experiences.

Memory research indicates that when people try to describe a past event (such as a story or personal experience) and their recall is incomplete, they will attempt to reconstruct the prior experience, making plausible inferences about what must have happened to fill in the gaps in memory and create a more orderly description. The same reconstruction processes occur when we try to describe our prior thoughts, feelings, and so forth. For example, in trying to describe our feelings in a situation involving personal failure, we might describe how we think we should feel, or how we have felt in typical, similar situations in the past, without necessarily recalling how we felt during the specific situation in question.

Likewise, interpretive introspection—in which we try to explain the causes of our thoughts, feelings and actions—is limited by our limited recall of pertinent antecedent events and thoughts. Interpretive introspection is often based more on inference than on memory, and it is heavily influenced by our prior beliefs about the causes of people's thoughts, feelings, and actions (Nisbett & Wilson 1977; Wilson & Stone 1985). (In Chapter 7, I will go into more detail on the role of inference processes in introspection.)

The bottom line is that introspection as a source of information about conscious experience is inherently restricted by limitations of memory storage and retrieval processes.[9] These problems can be reduced, but not necessarily eliminated, when introspective reports follow the primary experience very quickly, so that pertinent experiences can be retrieved from short-term rather than long-term memory. Descriptive and interpretive introspection

are not fundamentally different from other cases of descriptive and interpretive thought. The main difficulty of introspection is the problem of obtaining accurate data about our conscious experiences from memory, and the problem of distinguishing accurate memories from plausible but possibly erroneous reconstructions.

CONCLUSION

Contrary to the beliefs of some earlier introspectionist philosophers and psychologists, introspection does not give us direct access to all mental events. At best, it gives us limited access to a limited aspect of mental life, namely, conscious experience. Fortunately, psychology is not limited to the introspective method for studying how the mind works. Psychologists have made considerable progress in understanding mental processes by making inferences from nonverbal behavior as well as nonintrospective verbal responses. Physiological responses, such as brain waves and evoked potentials, have also been useful. However, if we want to study conscious experience *per se*, then we must rely on introspective reports as one of our methods. Other measures, such as physiological responses and various nonverbal behaviors, are useful insofar as they have been validated by showing their correlation with introspective reports on conscious experience. For example, in Chapter 11 we will see that brain wave recordings are useful for studying consciousness in different sleep states, insofar as different brain wave patterns are correlated with different patterns of subjective experience as revealed in introspective reports (such as dream reports). Thus, if we are to study consciousness we must use introspection and introspective reports, and we must understand their potentials and their limitations.

We will encounter instances of introspection and introspective reporting throughout this book. In the next chapter we will see how Descartes used introspection to try to understand the relationship between the mind and the body, and drew conclusions with profound implications for psychology, philosophy, and religion. In Chapters 5 and 6 we will see how introspective reports have been used in research on the brain processes that underlie conscious experience, and we will discuss some of the evidence for the claim that many mental processes occur nonconsciously. Then in Chapter 7 we will discuss the question of whether we have introspective access to our higher mental processes and the causes of our actions. In later chapters, introspective reports will be critical for studying conscious experience during daydreaming, dreaming, hypnosis, meditation, and states induced by psychedelic drugs.

SUMMARY

Introspection was tentatively defined as looking into one's own mind and observing its contents, in other words, observing one's conscious experience. An introspective verbal report (IVR) is a description of one's conscious experience in words. Three types of introspection were distinguished: analytic,

descriptive (phenomenological), and interpretive. Eight limitations on the accuracy of introspective verbal reports on conscious contents were discussed: (1) forgetting; (2) reconstruction errors; (3) verbal description difficulties; (4) distortion through observation; (5) censorship; (6) experimental demands (7) lack of independent verification; and (8) substitution of inferences for observations.

Six methods of obtaining introspective reports, and their particular limitations, were described: (1) thinking out loud; (2) thought sampling; (3) retrospective reports; (4) event recording; (5) diaries; and (6) group questionnaires. None of the methods is perfect; researchers must select the method that is best suited for the specific problem being investigated.

The question of what is really going on during introspection was discussed. Introspection is not literally "looking within" in a perceptual sense, nor can one directly observe one's ongoing thought processes. Rather, it was argued, introspection is a thought process—thinking about our (primary) conscious experiences—and the data of introspection come from memory. Thus, introspection is retrospection. Due to limitations of memory and errors of reconstruction and inference, introspection is inherently an imperfect method for studying conscious experience. Nonetheless, it is a critical method, so researchers need to learn about its potentials and its limitations.

ENDNOTES

[1]Does everyone introspect? To people who are in the habit of introspecting it may seem obvious that introspection is natural and that everyone does it. But this is not necessarily the case. Introspection is a sophisticated kind of thinking. We know little or nothing about the prevalence or nature of introspection in simple-minded people or in primitive people who have good practical intelligence but little interest in psychological questions. In a study involving extensive interviewing of subjects, Belenkey et al. (1986) found poorly developed capacities for introspection, reflective thought, and self-concept among some people from lower socioeconomic and educational levels. The authors attributed these underdeveloped capacities to negative social experiences in childhood and adulthood (such as being abused or ignored), and suggested that reflective thought could be enhanced through more positive social encounters.

[2]Attempts to suppress unwanted thoughts are only partly successful, and there may be a rebound of increased frequency of such thoughts after we stop trying to suppress them (Wegner et al. 1987). See Wegner (1989) for an interesting discussion of the psychological consequences of attempting to suppress unwanted thoughts.

[3]It should be clear that in talking about introspective observation, I do not mean observation in the sense of looking at something. Rather, I mean observation in the sense of "an act of recognizing and noting a fact or occurrence" (*Webster's Ninth New Collegiate Dictionary*).

[4]For more on the nineteenth-century psychologists' ideas about introspection, see Danziger (1980) or Leahey (1987); or see Fancher (1990) for a brief and entertaining account. See Lyons (1986) for a contemporary analysis.

[5]In Chapter 1 I said that introspection is an aspect of reflective consciousness. In fact, there is no clear distinction between the concepts of introspection and reflective consciousness. Both refer to thoughts about our own thoughts. The term "introspection" is used more commonly when reflective thought is intended to lead to an introspective verbal report for the purpose of psychological research or philosophical writing. "Reflection" (or "reflective thought" or "reflective consciousness") is used more commonly in regard to more private, informal ruminations. The processes of evaluating our thoughts and actions, and comparing them to a self concept, are aspects of reflective consciousness.

[6]Here and elsewhere, conscious "experience" is a somewhat problematic term, because the

word "experience" may seem to imply passiveness (like something that happens to us), whereas the term "conscious experience" is intended to cover active thinking and perceptual searching as well as more passive perceptions, feelings, and images. No entirely suitable English-language generic term exists to cover the full range of conscious contents, but it seems preferable to settle arbitrarily on a single term such as "experiences" rather than repeating each time a list of what is intended (perceptions, thoughts, feelings, and so forth). (William James struggled with this terminology problem, and settled on "thoughts" as a generic term, though "thoughts" has its own unintended connotations—it seems to stress intellectual activity over perception and feeling.)

[7]To say that the primary conscious experience continues more- or-less unchanged is not to say that the primary experience is not affected by the act of introspection. A primary conscious experience might well have been somewhat different if it had been allowed to flow without interruption by periods of introspection. For example, a spontaneous sensuous experience might be less spontaneous and sensuous if you introspect on what you are doing and feeling. But the point is that, given that the primary experience is being introspected, the experience-as-introspected may remain relatively unchanged through several cycles of alternation of introspection and primary experience.

[8]Peripheral awareness of current sensory perceptions (discussed in Chapter 1) can continue during introspection. For example, you might introspect on a recent emotional experience while you are driving a car with visual guidance. My argument is that focal attention alternates between primary consciousness and introspection; we cannot focally attend to both at the same time. But highly practiced actions such as driving a car can be carried out in a largely automatic manner; they require little focal attention, so there is little interference with introspection. Only under unfamiliar and difficult conditions (such as heavy traffic) when driving requires almost continuous focal attention is it likely to interfere with introspection—or vice versa.

[9]Natsoulas (1985) argued for a concept of "direct (reflective) consciousness," which involves direct observation or recall of conscious experiences, without reconstruction or inference. My argument is that reconstruction and inference processes are common in descriptive introspection (as well as interpretive introspection), and we have to be cautious about assuming that introspective reports are direct reports of directly observed or recalled conscious experience. Natsoulas's term, "direct (reflective) consciousness," can be confusing because "direct" sounds like what I call primary consciousness, but Natsoulas is really referring to pure (noninferential) reflective consciousness.