

Whatever Happened to Little Albert?

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ABSTRACT: *John B. Watson and Rosalie Rayner's 1920 conditioning of the infant Albert B. is a well-known piece of social science folklore. Using published sources, this article reviews the study's actual procedures and its relationship to Watson's career and work. The article also presents a history of psychologists' accounts of the Albert study, focusing on the study's distortion by Watson himself, general textbook authors, behavior therapists, and most recently, a prominent learning theorist. The author proposes possible causes for these distortions and analyzes the Albert study as an example of myth making in the history of psychology.*

Almost 60 years after it was first reported, Watson and Rayner's (1920) attempted conditioning of the infant Albert B. is one of the most widely cited experiments in textbook psychology. Undergraduate textbooks of general, developmental, and abnormal psychology use Albert's conditioning to illustrate the applicability of classical conditioning to the development and modification of human emotional behavior. More specialized books focusing on psychopathology and behavior therapy (e.g., Eysenck, 1960) cite Albert's conditioning as an experimental model of psychopathology (i.e., a rat phobia) and often use Albert to introduce a discussion of systematic desensitization as a treatment of phobic anxiety.

Unfortunately, most accounts of Watson and Rayner's research with Albert feature as much fabrication and distortion as they do fact. From information about Albert himself to the basic experimental methods and results, no detail of the original study has escaped misrepresentation in the telling and retelling of this bit of social science folklore.

There has recently been a revival of interest in Watson's conditioning research and theorizing (e.g., MacKenzie, 1972; Seligman, 1971; Weimer & Palermo, 1973; Samelson, Note 1), and in the mythology of little Albert (Cornwell & Hobbs, 1976; Larson, 1978; Prytula, Oster, & Davis, 1977). However, there has yet to be a complete examination of the methodology and results of the

Albert study and of the process by which the study's details have been altered over the years. In the spirit of other investigations of classic studies in psychology (e.g., Ellenberger, 1972; Parsons, 1974) it is time to examine Albert's conditioning in light of current theories of learning. It is also time to examine how the Albert study has been portrayed over the years, in the hope of discovering how changes in psychological theory have affected what generations of psychologists have told each other about Albert.

The Experiment

As described by Watson and Rayner (1920), an experimental study was undertaken to answer three questions: (1) Can an infant be conditioned to fear an animal that appears simultaneously with a loud, fear-arousing sound? (2) Would such fear transfer to other animals or to inanimate objects? (3) How long would such fears persist? In attempting to answer these questions, Watson and Rayner selected an infant named Albert B., whom they described as "healthy," and "stolid and unemotional" (p. 1). At approximately 9 months of age, Albert was tested and was judged to show no fear when successively observing a number of live animals (e.g., a rat, a rabbit, a dog, and a monkey), and various inanimate objects (e.g., cotton, human masks, a burning newspaper). He was, however, judged to show fear whenever a long steel bar was unexpectedly struck with a claw hammer just behind his back.

Two months after testing Albert's apparently unconditioned reactions to various stimuli, Watson and Rayner attempted to condition him to fear a

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white rat. This was done by presenting a white rat to Albert, followed by a loud clanging sound (of the hammer and steel bar) whenever Albert touched the animal. After seven pairings of the rat and noise (in two sessions, one week apart), Albert reacted with crying and avoidance when the rat was presented without the loud noise.

In order to test the generalization of Albert's fear response, 5 days later he was presented with the rat, a set of familiar wooden blocks, a rabbit, a short-haired dog, a sealskin coat, a package of white cotton, the heads of Watson and two assistants (inverted so that Albert could touch their hair), and a bearded Santa Claus mask. Albert seemed to show a strong fear response to the rat, the rabbit, the dog, and the sealskin coat; a "negative" response to the mask and Watson's hair; and a mild response to the cotton. Also, Albert played freely with the wooden blocks and the hair of Watson's assistants.

After an additional 5 days, Watson reconditioned Albert to the rat (one trial, rat paired with noise) and also attempted to condition Albert directly to fear the previously presented rabbit (one trial) and dog (one trial). When the effects of this procedure were tested in a different, larger room, it was found that Albert showed only a slight reaction to the rat, the dog, and the rabbit. Consequently, Watson attempted "to freshen the reaction to the rat" (p. 9) by presenting it with the loud noise. Soon after this, the dog began to bark loudly at Albert, scaring him and the experimenters and further confounding the experiment.

To answer their third question concerning the permanence of conditioned responses over time, Watson and Rayner conducted a final series of tests on Albert after 31 days of neither conditioning nor extinction trials. In these tests, Albert showed fear when touching the Santa Claus mask, the sealskin coat, the rat, the rabbit, and the dog. At the same time, however, he initiated contact with the coat and the rabbit, showing "strife between withdrawal and the tendency to manipulate" (Watson & Rayner, 1920, p. 10). Following these final tests, Albert's mother removed him from the hospital where the experiment had been conducted. (According to their own account, Watson and Rayner knew a month in advance the day that Albert would no longer be available to them.)

The Context of Watson and Rayner's Study

What was the relationship of the Albert experiment to the rest of Watson's work? On a per-

sonal level, this work was the final published project of Watson's academic career, although he supervised a subsequent, related study of the deconditioning of young children's fears (M. C. Jones, 1924a, 1924b). From a theoretical perspective, the Albert study provided an empirical test of a theory of behavior and emotional development that Watson had constructed over a number of years.

Although Watson had publicly declared himself a "behaviorist" in early 1913, he apparently did not become interested in the conditioning of motor and autonomic responses until late 1914, when he read a French edition of Bekhterev's *Objective Psychology* (see Hilgard & Marquis, 1940). By 1915, Watson's experience with conditioning research was limited to this reading and his collaboration with his student Karl Lashley in a few simple studies. Nevertheless, Watson's APA Presidential Address of that year made conditioned responses a key aspect of his outline of behaviorism and seems to have been one of the first American references to Bekhterev's work (Hilgard & Marquis, 1940, p. 24; Koch, 1964, p. 9; Watson, 1916b). Less than a year after his APA address, two articles by Watson (1916a, 1916c) were published in which he hypothesized that both normal defense mechanisms and psychiatric disorders (e.g., phobias, tics, hysterical symptoms) could be understood on the basis of conditioning theory.

Six months later, the *American Journal of Psychology* featured a more extensive article by Watson and J. J. B. Morgan (1917) that formulated a theory of emotion, intended to serve both experimentalists and clinicians. Its authors hypothesized that the fundamental (unlearned) human emotions were fear, rage, and love; these emotions were said to be first evoked by simple physical manipulations of infants, such as exposing them to loud sounds (fear) or restricting their movements (rage). Concurrently, they hypothesized that "the method of conditioned reflexes" could explain how these basic three emotions become transformed and transferred to many objects, eventually resulting in the wide range of adult emotions that is evoked by everyday combinations of events, persons, and objects. In support of these theoretical ideas, Watson and Morgan began to test whether infants' fears could be experimentally conditioned, using laboratory analogues of thunder and lightning. In the description of this work and the related theory, a strong appeal was made for its practical importance, stating that it could lead to a standard experimental procedure for "bringing

the human emotions under experimental control" (p. 174).

By the early months of 1919, Watson appears not yet to have found a reliable method for experimentally eliciting and extinguishing new emotional reactions in humans. However, by this time he had developed a program of research with infants to verify the existence of his hypothesized three fundamental emotions. Some early results of this work were described in May 1919, as part of a lengthy treatise on both infant and adult emotions. Anticipating his work with Albert,¹ Watson (1919b) for the first time applied his earlier principles of emotional conditioning to children's fears of animals. Based on a case of a child frightened by a dog that he had observed, Watson hypothesized that although infants do not naturally fear animals, if "one animal succeeds in arousing fear, any moving furry animal thereafter may arouse it" (p. 182). Consistent with this hypothesis, the results of Watson and Rayner's experiments with Albert were reported 9 months later.

Although Watson's departure from Johns Hopkins prematurely ended his own research in 1920, he continued to write about his earlier findings, including his work with Albert. In 1921, he and Rayner (then Rosalie Rayner Watson) summarized the results of their interrupted infant research program, concluding with a summary of their experience with Albert. Although this was a less complete account than their 1920 article, it was the version that was always referenced in Watson's later writings. These writings included dozens of articles in the popular press (e.g., Watson, 1928b, 1928c), the books *Behaviorism* (1924) and *Psychological Care of Infant and Child* (1928a), and a series of articles in *Pedagogical Seminary* (Watson, 1925a, 1925b, 1925c). Many of these articles retold the Albert story, often with photographs and with added comments elaborating on the lessons of this study.

Introductory-Level Textbook Versions of Albert

A selective survey of textbooks² used to introduce students to general, developmental, and abnormal psychology revealed that few books fail to refer to Watson and Rayner's (1920) study in some manner. Some of these accounts are completely accurate (e.g., Kennedy, 1975; Page 1975; Whitehurst & Vasta, 1977). However, most textbook versions of Albert's conditioning suffer from inaccuracies of various degrees. Relatively minor

details that are misrepresented include Albert's age (Calhoun, 1977; Johnson & Medinnus, 1974), his name (Galanter, 1966), the spelling of Rosalie Rayner's name (e.g., Biehler, 1976; Helms & Turner, 1976; McCandless & Trotter, 1977; Papalia & Olds, 1975), and whether Albert was initially conditioned to fear a rat or a rabbit (CRM Books, 1971; Staats, 1968).

Of more significance are texts' misrepresentations of the range of Albert's postconditioning fears and of the postexperimental fate of Albert. The list of spurious stimuli to which Albert's fear response is claimed to have generalized is rather extensive. It includes a fur pelt (CRM Books, 1971), a man's beard (Helms & Turner, 1976), a cat, a pup, a fur muff (Telford & Sawrey, 1968), a white furry glove (Whittaker, 1965), Albert's aunt, who supposedly wore fur (Bernhardt, 1953), either the fur coat or the fur neckpiece of Albert's mother (Hilgard, Atkinson, & Atkinson, 1975; Kisker, 1977; Weiner, 1977), and even a teddy bear (Boring, Langfeld, & Weld, 1948). In a number of texts, a happy ending has been added to the story by the assertion that Watson removed (or "reconditioned") Albert's fear, with this process sometimes described in detail (Engle & Snellgrove, 1969; Gardiner, 1970; Whittaker, 1965).

What are the causes of these frequent errors by the authors of undergraduate textbooks? Prytula et al. (1977) cataloged similar mistakes but offered little explanation of their source. Cornwell and Hobbs (1976) suggested that such distortions, if not simply due to overreliance on secondary sources, can be generally seen as authors'

¹In tracing the development of Watson's ideas about conditioning, it would be helpful to know whether the experiments with Albert had already begun when Watson wrote his 1919 *Psychological Review* article. Unfortunately, there is no hard evidence of exactly when the Albert study was completed. Watson and Rayner's original report was published in the February 1920 *Journal of Experimental Psychology*, suggesting that the research was completed in 1919. Also, M. C. Jones (1975, Note 2) remembers that Watson lectured about Albert as early as the spring of 1919 and showed a film of his work with infants at the Johns Hopkins University (Watson, 1919a). Individual frames of this film published later ("Behaviorist Babies," 1928; "Can Science Determine Your Baby's Career Before It Can Talk?," 1922; Watson, 1927, 1928a) suggest that at some date this film contained footage of Albert's conditioning. Since the work with Albert lasted for approximately 4 months, there seems to be a strong possibility that Watson's 1919 prediction was not entirely based on theoretical speculation.

²After this survey of texts was completed, similar reviews by Cornwell and Hobbs (1976) and by Prytula et al. (1977) were discovered. Interested readers should consult these articles for lists of additional textbook errors.

attempts to paint the Albert study (and Watson) in a more favorable light and to make it believable to undergraduates. Certainly, many of the common errors *are* consistent with a brushed-up image of Watson and his work. For example, not one text mentions that Watson knew when Albert would leave his control—a detail that might make Watson and Rayner's failure to recondition Albert seem callous to some modern readers.

However, there are other reasons for such errors besides textbooks' tendencies to tell ethically pleasing stories that are consistent with students' common sense. One major source of confusion about the Albert story is Watson himself, who altered and deleted important aspects of the study in his many descriptions of it. For example, in the *Scientific Monthly* description of the study (Watson & Watson, 1921), there is no mention of the conditioning of Albert to the dog, the rabbit, and the rat that occurred at 11 months 20 days; thus Albert's subsequent responses to these stimuli can be mistaken for a strong generalization effect (for which there is little evidence). A complementary and equally confusing omission occurs in *Psychological Care of Infant and Child* (Watson, 1928a). There, Watson begins his description of the Albert study with Albert's being conditioned to a rabbit (apparently the session occurring at 11 months 20 days). As a result, the reader is led to believe that Albert's fear of a rat (a month later) was the product of generalization rather than the initial conditioning trials. Besides these omissions, Watson and Rayner (1920) also made frequent editorial comments, such as the assertion that fears such as Albert's were "likely to persist indefinitely, unless an accidental method for removing them is hit upon" (p. 12). Given such comments, it is understandable that one recent text overestimates the duration of the Albert experiment by 300% (Goldenberg, 1977), and another states that Albert's "phobia became resistant to extinction" (Kleinmuntz, 1974, p. 130).

A second reason for textbook authors' errors, it seems, is the desire of many of us to make experimental evidence consistent with textbook theories of how organisms should act. According to popular versions of learning theory (as described by Herrnstein, 1977), organisms' conditioning should generalize along simple stimulus dimensions; many textbooks list spurious fear-arousing stimuli (for Albert) that correspond to such dimensions. To illustrate the process of stimulus generalization, Albert is often said to have feared every white,

furry object—although he actually showed fear mostly of nonwhite objects (the rabbit, the dog, the sealskin coat, Watson's hair), and did not even fear everything with hair (the observers). But to fit a more simplified view of learning, either new stimuli appear in some texts (e.g., a *white* rabbit, a white glove) or it is simply asserted that Albert's conditioning generalized to all white and furry (or hairy) stimuli (see Biehler, 1976; Craig, 1976; Helms & Turner, 1976). Though it might seem as if Albert's fear did generalize to the category of all animate objects with fur (e.g., the rabbit) or short hair (e.g., Watson's head), this is impossible to show conclusively. The only experimental stimuli not fitting this category were the blocks and the observers' hair. Apparently the blocks were a familiar toy (thus not a proper stimulus), and Albert's familiarity with the observers is not known (although we may guess that one might have been his mother).

Behavior Therapists' Views of Albert

Unfortunately, misrepresentations of Watson and Rayner's (1920) work are not confined to introductory-level texts. For proponents of behavioral therapies, Albert's conditioning has been a frequently cited reference, although its details have often become altered or misinterpreted. Joseph Wolpe, for example, is well known for his conditioned-anxiety model of phobias and his treatment of various neurotic disorders by what was originally termed "reciprocal inhibition" (Wolpe, 1958). According to Wolpe and Rachman (1960):

Phobias are regarded as conditioned anxiety (fear) reactions. Any "neutral" stimulus, simple or complex, that happens to make an impact on an individual at about the time that a fear reaction is evoked acquires the ability to evoke fear subsequently. (p. 145)

In support of this model Wolpe and Rachman cited the Albert study to "indicate that it is quite possible for one experience to induce a phobia" (p. 146). Also, Eysenck (1960) asserted that "Albert developed a phobia for white rats and indeed for all furry animals" (p. 5). Similar interpretations of Watson and Rayner's (1920) experiment are found in subsequent writings by Wolpe and other behavior therapists (e.g., Rachman, 1964; Sandler & Davidson, 1971; Ullman & Krasner, 1965; Wolpe, 1973).

Critical reading of Watson and Rayner's (1920) report reveals little evidence either that Albert developed a rat phobia or even that animals con-

sistently evoked his fear (or anxiety) during Watson and Rayner's (1920) experiment. For example, 10 days after the completion of the initial (seven-trial) conditioning to a white rat, Albert received an additional trial of conditioning to the same rat. Immediately following this, his reaction to the rat was described as: "Fell over to the left side, got up on all fours and started to crawl away. On this occasion there was no crying, but strange to say, as he started away he began to gurgle and coo, even while leaning far over to the left side to avoid the rat" (p. 7).

On the same day as this, Albert received a trial of conditioning to the rabbit he had seen previously (using the clanging steel bar). When shown the rabbit twice again, he whimpered but did not cry. Immediately after this, his reactions were tested in a different (larger) room. When shown the rabbit, Albert's response was described as: "Fear reaction slight. Turned to left and kept face away from the animal but the reaction was never pronounced" (p. 9).

Finally, 31 days later and after having received an additional conditioning trial to the rat at the end of the preceding session, Albert's reactions to the (same) rat were:

He allowed the rat to crawl towards him without withdrawing. He sat very still and fixated intently. Rat then touched his hand. Albert withdrew it immediately, then leaned back as far as possible but did not cry. When the rat was placed on his arm he withdrew his body and began to fret, nodding his head. The rat was then allowed to crawl against his chest. He first began to fret and then covered his eyes with both hands. (p. 11)

Not only does Albert's response seem lacking in the strength that we associate with phobia (possibly due to Watson's alternation of acquisition and extinction trials) but on a qualitative basis it seems unlike the classically conditioned anxiety on which some behavior therapists base their theoretical models of phobias.

Of course, it might be argued by proponents of a two-factor theory of phobias that Albert's reactions to the rat and the rabbit were successful escape responses from the anxiety-arousing stimuli, thus explaining Albert's relative calm (no rapid breathing, crying, etc.). However, Albert did not consistently avoid the animals to which he was conditioned. On his final day of testing, for example, Albert initially did not avoid the rabbit to which he had been conditioned; he then attempted to avoid it, but then "after about a minute he reached out tentatively and slowly and touched

the rabbit's ear with his right hand, finally manipulating it" (Watson & Rayner, 1920, p. 11).⁸

A more serious problem with clinicians' citing of the Albert study is the failure of Watson's contemporaries to replicate his work. Although H. E. Jones (1930) subsequently demonstrated persistent galvanic skin response (GSR) conditioning with an infant (using a mild electric current as an unconditioned stimulus, and a light and various sounds as conditioned stimuli), attempts to replicate the Albert study using variations of Watson's own method were unsuccessful. Valentine (1930), for example, used extensive naturalistic observation and failed to find conditioned fear of infants to loud noises; he criticized both Watson's methodology and his simplistic theory of emotional development. Bregman (1934) was also unsuccessful in her attempts to condition even 1 of 15 infants to fear wooden and cloth objects, using a disagreeable noise as an unconditioned stimulus (see Thorndike, 1935). Finally, whatever our retrospective view of Albert's conditioned reactions, a conditioned-avoidance model of phobias (with fear as a necessary component) is not consistent with more recent experimental and clinical literature (see Costello, 1970; Himeline, 1977; Marks, 1969, 1977).

Albert and Preparedness Theory

One of the reasons that Albert is so well known is that he is rediscovered every 5 or 10 years by a new group of psychologists. In the early 1960s, Wolpe and Eysenck were the curators and analysts of the Albert myth. Ten years later, Wolpe and Eysenck were supplanted by M. E. P. Seligman,

⁸ Another model that has been applied to the Albert study is that of operant or instrumental conditioning. For example, Larson (1978) and Reese and Lipsitt (1970) cited a paper by R. M. Church (Note 3) on this point (see also Kazdin, 1978). Such an interpretation is apparently based on Watson's notes indicating that at least for the first two trials, the loud noise was contingent on Albert's active response (i.e., touching the rat). Also, the one trial of conditioning to the rabbit occurred when Albert had begun "to reach out and manipulate its fur with forefingers" (Watson & Rayner, 1920, p. 8). The attractiveness of an (aversive) instrumental model of Albert's conditioning is that it would not necessarily predict any emotional reaction by Albert and would help explain his reluctance to touch the experimental animals. Strong support for this model is lacking, however, with Watson and Rayner describing at least four conditioning trials on which the loud sound was not contingent on Albert's instrumental response, and a number of trials the character of which is uncertain.

who has seized control of the Albert story and uses it (in slightly revised form) to attack the views of its former proponents. At the same time, Seligman both challenges traditional theories of learning and proposes his own reformulation, known as "preparedness theory."

Briefly stated, preparedness theory (Seligman, 1970, 1971; see also Schwartz, 1974) posits that traditionally held laws of learning cannot be uniformly applied to all stimuli interacting with all organisms. In a classical conditioning paradigm, organisms may be physiologically or cognitively "prepared" to form certain conditioned stimulus-unconditioned stimulus associations and "contra-prepared" to develop others. In the former case (e.g., rats learning taste aversion to food causing illness) the association is easily formed, but in the latter case (e.g., rats learning taste aversion to food paired with footshock) it is difficult if not impossible to form. Similarly, Seligman (1970) summarized evidence from instrumental-learning paradigms to suggest that for a particular organism, certain behaviors differ in their potential to be successfully conditioned (see Shettleworth, 1973).

Relevant to Albert, Seligman (1971) hypothesized that the strength of human phobic reactions (i.e., their resistance to extinction) is due to the high degree of preparedness of certain stimuli (e.g., snakes). This conditioning to phobic objects occurs very quickly, whereas conditioning to other stimuli (assumed to be of low preparedness or contra-prepared) results in fear reactions that are less intense, take longer to establish, and extinguish more quickly. As Marks (1977) noted, there is some evidence that objects differ in their ability to produce conditioned GSR in humans over time (e.g., Öhman, Erixon, & Löfberg, 1975). It also makes sense that evolution may have made it easier for humans to learn some responses than others (see Herrnstein, 1977). However, much of Seligman's (1971) discussion of human phobias is based on an erroneous interpretation of Watson and Rayner's (1920) work.

As described in his article "Phobias and preparedness," Seligman's version of Albert's conditioning is generally consistent with the exaggerated claims for the study made by Watson (e.g., Watson, 1924). According to preparedness theory, the existence of strong animal phobias in the human clinical literature is evidence that "furry things" (Seligman, 1971, p. 315) are strongly prepared phobic stimuli for humans. If furry things are highly prepared and Watson and Rayner

(1920) used furry things in their study, then Albert must have quickly developed a strong fear of animals and other furry things. Consistent with this logic is Seligman's (1971) assertion that "Albert became afraid of rats, rabbits, and other furry objects" (p. 308, italics added) and that Watson "probably did not" become an aversive stimulus to Albert. In fact, Albert was "completely negative" to Watson's hair (Watson & Rayner, 1920, p. 7), and of course, Albert's fear was only tested to a single rat, a single rabbit, and to no previously neutral, nonfurry objects.

In addition to presenting this inaccurate picture of how Albert's fear initially generalized, Seligman's account also misrepresents the ease with which Albert was conditioned, the durability of his reactions, and the details of an attempt to replicate the Albert study. According to Seligman (1971), Albert's "conditioning occurred in two trials" and this "prepared fear conditioning [did] not extinguish readily" (p. 315). In fact, "seven joint stimulations were given [to Albert] to bring about the complete reaction" (Watson & Rayner, 1920, p. 5), and there is little if any evidence either that the reactions of Albert were resistant to a formal extinction procedure (or to the passage of time) or that he was tested with valid contra-prepared stimuli. Further, in describing a similar study that actually used a contra-prepared stimulus (a wooden duck), Seligman erred in his statement that the experimenter "did not get fear conditioning to a wooden duck, even after many pairings with a startling noise" (1971, p. 315). In fact, the experimenter himself admitted that this failure was due to the inadequacy of his unconditioned stimulus, not to the inappropriateness of a wooden duck as a phobic stimulus:

We did not succeed in establishing a conditional fear response to the duck for the simple reason that the noise failed to evoke fear. Once only in something over fifty trials did the child exhibit what might be called a worried look. (English, 1929, p. 222)

One can understand how the Albert study could be selectively misperceived by Seligman, since the errors that he committed result in a historical account that provides more support for the predictions of his preparedness theory than does (subsequent) clinical observation (DeSilva, Rachman, & Seligman, 1977; Rachman & Seligman, 1976). It seems ironic that in making his case for the new theory of preparedness, Seligman first had to strengthen the old Watsonian interpretation of the Albert study: that it was a successful laboratory

demonstration of fear conditioning, its generalization, and resistance to extinction.

Conclusions

What can be deduced from reviewing the many versions of Watson and Rayner's study of Albert? One somewhat obvious conclusion is that we should be extremely wary of secondhand (and more remote) accounts of psychological research. As Cornwell and Hobbs (1976) suggested, this may be most relevant to often-cited studies in psychology, since we may be more likely to overestimate our knowledge of such bulwarks of textbook knowledge.

What about the process by which secondary sources themselves come to err in their description of classic studies? A simple explanation might assume that more recent authors, like any recipients of secondhand information (e.g., gossip), are more likely to present an account of much-cited research that has "drifted well away from the original" (Cornwell & Hobbs, 1976, p. 9). For the Albert study at least, this relatively passive model of communication is an oversimplified view. Not only was Watson quick to *actively* revise his own description of his research (e.g., Watson, 1928a; Watson & Watson, 1921) but it took little time for textbook authors to alter the details of Albert's conditioning. For example, within a year after Watson's original article, one text (Smith & Guthrie, 1921) had already invented spurious stimuli to which Albert's initial fear generalized; such errors were also contained in early texts by H. L. Hollingworth (1928) and J. W. Bridges (1930).

There has undoubtedly been some distortion due to the simple retelling of the Watson and Rayner study, but a more dynamic influence on textbook accounts seems to have been the authors' opinions of behaviorism as a valid theoretical viewpoint. For example, the agreement of Harvey Carr's (1925) text with Watson's overgeneralizations about Albert was consistent with Carr's (1915) relatively favorable review of Watson's early work. Similarly, as behaviorism's influence grew, even relative skeptics seem to have been willing to devote more attention to the Albert study. For example, the fourth edition of Robert S. Woodworth's (1940) text, *Psychology*, mentioned that Albert's "conditioned fear was 'transferred' from the rat to similar objects" (p. 379), though the previous edition of the text (Woodworth, 1934) did not mention this generalization and was more critical of Watson's theory of emo-

tional development. Woodworth's 1934 text also had Albert initially conditioned to a rabbit, while the 1940 one correctly described the conditioned stimulus of a rat. This greater accuracy in Woodworth's later account is an indication of at least one author's ability to resist any general drift toward increasing misinformation.

Any attempted explanation of textbook errors concerning Albert raises the question of the role of classic studies and the nature of historical changes in psychology. As discussed by Samelson (1974) and Baumgardner (1977), modern citations of classic studies can often be seen as attempts by current theorists to build a false sense of continuity into the history of psychology. In social psychology, for example, claiming Auguste Comte as a founder of the field (see Allport, 1968) gives the impression that our contemporary motives (especially the wish for a well-developed behavioral science) have directed the field's progress for almost a century (Samelson, 1974). To cite another classic "origin," the Army's psychological testing program during World War I is taken by some clinical psychologists as an early example of how the profession of psychology has always grown in relation to its increased usefulness. However, it has recently been shown that World War I intelligence testing was of little practical use at the time (Samelson, 1977).

In reviewing these classic studies or *origin myths* in psychology, it should be emphasized that this myth-making process is not anyone's attempt to defraud the public. Instead, it arises "as largely a byproduct of pedagogy: as a means to elucidate the *concepts* of a scientific specialty, to establish its *tradition*, and to attract students" (Samelson, 1974, p. 223).⁴ This seems a fair explanation of the Albert case—one that casts the frequent "re-discoverers" of Watson and Rayner (Garrett, 1941; Harlow, 1949; Salter, 1949; Seligman, 1971; Watson, 1928a; Wolpe, 1958) as participants in the process of building historical support for new theoretical perspectives (e.g., preparedness theory).

As Samelson (1974) noted, the major difficulty with such reevaluations of classic studies is that they obscure the actual factors that determine the course of scientific research. In the case of the Albert study, debate still surrounds the question, How did behaviorism become a dominant force in American psychology (MacKenzie, 1972, 1977;

⁴ Samelson noted that he was paraphrasing T. S. Kuhn (1968) here.

Weimer & Palermo, 1973)? The answer is beyond the scope of this study, since it involves much more than an evaluation of the Albert study.⁵ However, it is now possible to assert that by itself the Albert study was not very convincing proof of the correctness of Watson's general view of personality and emotions. In addition to the study's reliance on only one subject, the experimental stimuli were insufficient to test for generalization effects, the observers' accounts were too subjective, and the technology did not exist to permit reliable assessment of emotional responses (see Sherman, 1927); there was insufficient follow-up and there was a confounding of instrumental and classical conditioning paradigms (see Footnote 3). These methodological flaws were also apparent to critical reviewers of the day (e.g., English, 1929; Valentine, 1930) and surely to Watson and Rayner themselves. However, they are worth emphasizing here because of continuing attempts to integrate the study into the early conditioning literature (e.g., Seligman, 1971). It may be useful for modern learning theorists to see how the Albert study prompted subsequent research (i.e., Bregman, 1934), but it seems time, finally, to place the Watson and Rayner data in the category of "interesting but uninterpretable results."

⁵ Other relevant factors include the relation of Watson's theory to psychoanalysis (Bakan, 1966), the state in 1920 of other theories of emotion, the impact of Watson's popular writing (Buckley, Note 4; Harris & Morawski, Note 5), and Watson's national reputation.

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