Assessing the Role of Contingency Awareness in Attitudinal Conditioning with Implications for Advertising Research

Several forces herald a growing interest in classical conditioning in the field of marketing. Fundamentally, the popular view that individuals often approach consumption in an uninvolved way (e.g., Kassarjian 1978, 1986; Olshavsky and Granbois 1979) fosters an interest in learning mechanisms entailing minimal cognitive activity (Allen and Madden 1985). Because "classical" (Pavlovian) conditioning traditionally and historically has been considered to be an automatic, reflexive, and non-cognitive learning process" (Dawson et al. 1982, p. 274), the inference that conditioning mechanisms are germane in uninvolving consumption contexts (e.g., Gorn 1982; Greenwald and Leavitt 1984; Holbrook and O'Shaughnessy 1984; Kroeber-Riel 1984; Shimp 1981) appears reasonable.

Marketing researchers' interest in low involvement ad processing is producing a body of work in which classical conditioning is as a key theoretical explanation. This work often features a distinction between central and peripheral routes to persuasion and presents conditioned learning as one explanation for the proposed influence of peripheral cues such as famous endorsers (e.g., Petty, Cacioppo, and Schumann 1983) or pleasant music (e.g., Gorn 1982). Similarly, research on attitude toward the ad (Aad) began with (cf. Mitchell and Olson 1981; Shimp 1981) and continues to rely on (e.g., Gardner 1985; MacKenzie, Lutz, and Belch 1986) classical conditioning as the explanation for Aad's role as a causal mediator.

Other forces that may add to the interest in conditioning frameworks derive from recent debates about strategies for knowledge development. A major point argued by relativists is that many research approaches can con-

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tribute to knowledge development in marketing (cf. Anderson 1983, 1986; Hirschman 1986; Peter and Olson 1983). However, some suggest that consumer and advertising research has been dominated by epistemology associated with psychology’s cognitivist tradition (cf. Anderson 1983, 1986; Holbrook and Hirschman 1982; Nord and Peter 1980; Peter and Olson 1987, p. 279; Preston 1982). Behaviorist paradigms are portrayed as a natural supplement to the traditional cognitivist approach (Anderson 1983; Holbrook and Hirschman 1982; Kassarjian 1986; Nord and Peter 1980; Peter and Olson 1987, Ch. 9; Preston 1982).

Notably, advocates of behaviorist approaches emphasize their value in supplying guidelines for general marketing practice (Nord and Peter 1980; Peter and Olson 1987, Ch. 9, 10) and specific advertising decisions (Gorn 1982; Holbrook and O’Shaughnessy 1984; Preston 1982). McSweeney and Bierley (1984) offer hypotheses about the application of conditioning principles that have been refined into specific advertising guidelines (Engel, Blackwell, and Miniard 1986, p. 172–6).

Given the emergence of the conditioning framework as a (1) theoretical construct, (2) metatheoretic alternative, and (3) heuristic for generating practical guidelines, the paucity of marketing research on the effects of conditioning is bothersome. There is ample evidence that Pavlovian procedures can be used to condition reflexive responses, but what such evidence implies about human preference is not obvious. Though the cognitive resources invested in many consumption decisions may be minimal, an assumption that low involvement preference formation approximates an involuntary reflex certainly needs empirical validation. The mixed support for the conditioning hypothesis in recent consumer studies (Allen and Madden 1985; Bierley, McSweeney, and Van- nieuwkerk 1985; Gorn 1982; Gresham and Shimp 1985; Macklin 1986) and the long-standing controversy in social psychology about whether or not attitudes can be conditioned (e.g., Fishbein and Ajzen 1975; Page 1969, 1974; Petty and Cacioppo 1981; Staats 1969) emphasize the need for empirical work. As McSweeney and Bierley (1984, p. 620) observe, “. . . the role of classical conditioning in consumer behavior and the accuracy of specific implications need to be established by careful experiments.”

**RESEARCH PURPOSE**

Legitimizing conditioning research for a marketing audience is accomplished most efficiently by noting that classical conditioning can be conceived as one of the basic mechanisms of attitude formation (e.g., Bagozzi et al. 1979; Greenwald 1968; Petty and Cacioppo 1981). Given the field’s historical emphasis on the attitude construct, the fact that we know so little about this basic mechanism is remarkable. The general goal of our research is to add to empirically based knowledge about the effects of conditioning procedures in shaping attitudes.

McSweeney and Bierley (1984) emphasize that it is difficult to generate support for a conditioning hypothesis without adhering to meticulous Pavlovian procedures. Many of McSweeney and Bierley’s guidelines were adopted in the two experiments reported herein; however, these experiments also diverge from a traditional Pavlovian agenda by attempting to ascertain the mediating impact of contingency awareness. The data upheld the value of an awareness construct in building theory about attitudinal conditioning. To furnish the context for a discussion of the diverse ways in which psychologists have treated the awareness issue, we first contrast Pavlovian and attitudinal conditioning.

**CONTRASTING THE PAVLOVIAN PARADIGM AND ATTITUDDINAL CONDITIONING**

Pavlovian conditioning has occurred when a previously neutral stimulus (the conditioned stimulus or CS) begins to evoke a reflexive response that formerly had been associated with some other stimulus (the unconditioned stimulus or US). Much of the modern Pavlovian research is formulated around the blink reflex in animals and human beings, but heart rate, electrical skin resistance, and blood pressure also are commonly studied (e.g., Hall 1976; Schwartz 1978). “In virtually all cases, researchers have observed the same phenomena that Pavlov observed in studying the salivary reflex in dogs” (Schwartz 1978, p. 41).

This type of research is justifiably considered equal to Skinner’s operant conditioning as a true exemplar of behaviorism. Part of the reason is historical: as noted by Dawson et al. (1982, p. 274), “. . . when the [Pavlovian] paradigm was exported to the United States, the presumed reflexive and noncognitive nature of the learning process fit well with the flourishing behavioristic zeitgeist.” The Pavlovian emphasis on how structures in environmental stimuli affect behavior, and correspondent deemphasis on internal psychology, are also crucial components of the behaviorist metaphysic (cf. Anderson 1986; Schwartz 1978; Zuriff 1985).

The body of work supporting Pavlov’s laws is impressive, but marketing researchers must confront the difficult question of generalizability. How much of this empirically based wisdom about involuntary reflexes should one translate to shaping attitudes? This specific question seems to underlie a research stream that began with the Staatse’s (1957, 1958, 1959) studies on the conditioning of evaluative meaning.
Conditioning Attitudes

In their prototypical experiment, Staats and Staats (1957) paired visually presented nonsense syllables (the CSs) with several spoken words (the USs) chosen to reflect common evaluative meaning (e.g., beauty, healthy, smart, success). After a series of pairings, subjects' ratings of the CSs indicated that the core meaning in the USs (i.e., either positive or negative evaluation) had transferred to the nonsense syllables. The Staatses concluded that this transfer took place without awareness, implying that attitudes could be formed via the "same" noncognitive mechanism that operates when conditioning a Pavlovian reflex.

Though the attitudinal and Pavlovian paradigms can be linked via metaphorical extrapolation, it is important to recognize their basic differences. By definition, the attitude research stream focuses on internal psychology; furthermore, researchers in this stream have been concerned with the cognitive activity that may be required when conditioning attitudes (cf. Insko and Oakes 1966; Page 1969, 1974; Staats 1969). Thus, unlike Pavlovian research, attitudinal conditioning cannot be characterized as pure-form behaviorism. Rather, to borrow Anderson's (1986, p. 165) terminology, attitudinal conditioning is somewhere in the "seam" between cognitivism and behaviorism.

Blending Research Traditions

Because our project addresses attitudinal conditioning, it entails research in the seam between cognitivism and behaviorism. This point is raised for several reasons. First, our objective is not to stage an empirical "confrontation" between the two programs. Given their inherent incommensurability (cf. Anderson 1986), such empirical competitions would be inconclusive. Additionally, the project is not an attempt to make the behaviorist program more cognitive or vice versa. Rather, it builds on extant work that has involved a blending of traditions. Finally, research in this seam presents a unique opportunity for knowledge development. As Peter and Olson (1987, p. 306) suggest, "...cognitive approaches that attempt to describe the internal mechanisms involved in conditioning processes not only add insight but also help to develop more effective conditioning strategies."

Pragmatic and theoretical advantages of blending cognitive considerations into a Pavlovian framework are noted throughout the article. Awareness has been the primary cognitive variable examined in prior research. The diverse perspectives one can take on this variable are considered next.

MULTIPLE PERSPECTIVES ON AWARENESS

When pure-form behaviorists and cognitivists compare approaches, one of the debates they cannot resolve is the role of awareness in conditioning. Their debate is unsolvable because it is grounded in fundamental differences at the level of metaphysical commitments (cf. Anderson 1986; Peter and Olson 1987, Ch. 9). In behaviorism, mental events are considered nonscientific and are not the focal point of research; hence, for the behaviorist, the awareness issue is simply not of interest.

The steadfast cognitivist, in contrast, perceives the awareness issue as pivotal. For example, Brewer (1974, p. 3) views "the hypothesis that events in conditioning come about in an automatic, unconscious fashion" as the central tenet in conditioning theory. He then dismisses the six decades of conditioning research by arguing that whenever effects are observed, they will be accompanied by conscious awareness on the part of subjects about what was expected of them.

Between these incommensurable positions is a body of work in which awareness is used as a progressive construct for enhancing understanding. In this seam or middle ground the focal variable is referred to as "contingency awareness." To explicate this position, we interpose it between the two other awareness views in the following discussion.

Conditioning Without Awareness

The Pavlovian tradition is commonly interpreted as implicating a noncognitive learning mechanism. In their attitude studies, the Staatses (1957, 1958, 1959) maintained consistency with this position through the extrapolation that subjects learned without awareness. Likewise, marketing researchers have assimilated the view that conditioned learning implies some preconscious, subliminal, or otherwise noncognitive process. In marketing research, conditioning mechanisms are commonly portrayed as automatic (e.g., MacKenzie, Lutz, and Belch 1986; Preston 1982), nonvolitional (Shimp 1981), and even uninhibited by consciousness (Kassarjian 1986; Kroeber-Riel 1979).

It is important to reiterate that a "conditioning-without-awareness" presumption need not follow from the Pavlovian position. As pure-form behaviorists, Pavlovians choose to avoid questions about the private mental events that cause or accompany conditioned learning (Dawson et al. 1982; Peter and Olson 1987, p. 301–3).

Conditioning with Contingency Awareness

A regular finding in conditioning research is that with repeated exposures to a CS-US combination, subjects learn that presentation of a particular US is contingent on the presence of a specific CS. This recognition of the CS-US pairing pattern is referred to as "contingency awareness." Contingency awareness seems to accompany successful conditioning, leading many scholars to challenge the conditioning-without-awareness viewpoint. As represented by Bandura (1974, p. 859):

Contrary to popular belief, the fabled reflexive conditioning in humans is largely a myth. Conditioning is simply a descriptive term for learning through paired experiences, not an explanation of how the change comes about. Originally, conditioning was assumed to occur automatically. On closer examination it turned out to be cogni-
tively mediated. People do not learn despite repetitive paired experiences unless they recognize that events are correlated.

Considerable evidence supports Bandura’s inference that contingency awareness acts as a causal mediator (e.g., Dawson 1973; Dawson et al. 1982; Hare 1964; Perruchet 1985; Rozelle 1968). For example, when researchers monitor contingency learning on a trial-by-trial basis, conditioning does not occur until the subject becomes aware (Baer and Fuhrer 1982; Biferno and Dawson 1977). Bandura’s conclusion also is supported by work in which contingency awareness is manipulated experimentally rather than measured post hoc (cf. Grings 1973; Hall 1976).

Two points are noteworthy about researchers who portray contingency awareness as a requirement for successful conditioning. First, though these researchers may not be pure-form behaviorists, they also are not challenging the potency of conditioning procedures. Second, the idea of a noncognitive process is not dismissed completely; some subscribe to Razran’s (1971) two-factor theory, which postulates noncognitive and cognitively mediated conditioning (cf. Dawson et al. 1982; Grings 1973).

Conditioning with Demand Awareness

A more extreme viewpoint simply equates awareness with demand artifact. Following Page (1969, 1974), we refer to it as the “demand awareness” position. Demand awareness has been a concern in situational conditioning (cf. Allen and Madden 1985; Fishein and Ajzen 1975; Gorn 1982; Insko and Oakes 1966; Petty and Cacioppo 1981), but in his review Brewer (1974) broadens the critique to all conditioning with adults. Brewer’s thesis is that subjects develop “conscious hypotheses and expectations about the experiment, and these produce the resulting conditioning” (p. 2).

Though Brewer might be dismissed as a cognitivist attacking behaviorism, the demand awareness issue is relevant for marketing research. As Page (1974, p. 486) observed: “... the straightforward simplicity of a conditioning hypothesis makes it difficult to design a study so that no subject can discern the hypothesis from the research operations.” This problem is aggravated by an issue we label the “repetitions dilemma.” Traditional views on conditioning suggest that more CS/US pairings will strengthen the effect; however, the dilemma in interpreting such an effect is that more pairings are a better cue to subjects about what is expected. Procedures that lack a rationale for the repetitive CS/US exposures seem susceptible to demand artifact (Sawyer 1975).

Summary

It is common in the conditioning literature to discuss the awareness issue without distinguishing contingency from demand awareness (e.g., Bierley, McSweeney, and Vannieuwkerk 1985; Brewer 1974; Gorn 1982; Staats and Staats 1957, 1958). Not drawing this distinction creates dysfunctional ambiguity. In human conditioning studies, assessing the relative impact (or lack thereof) of contingency versus demand awareness would be useful. Contingency awareness implies only that an effect is cognitively mediated, whereas demand awareness implies artifact. These issues are empirically tractable and warrant consideration in assessing the efficacy of Pavlovian procedures for shaping attitudes.

EXPERIMENT 1

Experiment 1 was developed to test Pavlovian procedure in the attitude-formation context; it features explicit assessment of contingency versus demand awareness. In addition, an experimental disguise was developed to legitimize the repetitive CS/US exposures.

Pavlovian Prescriptions

The procedure follows guidelines provided by McSweeney and Bierley (1984). To promote conditioning, a salient CS and a strong US were used (see McSweeney and Bierley 1984, p. 626). Subjects played a computerized word game. Its focal point was five Norwegian words. Pretesting was used to select words that were evaluatively neutral; as the object of the game, these words (i.e., the CSs) were highly salient.

Players did not realize that their success rates had been preprogrammed; each Norwegian word was paired with different winning colors. For example, one CS always predicted a successful outcome (i.e., the US). A win was communicated by such phrases as “excellent,” “well done,” and “nice job.” This approach created a strong US in that certain CSs predicted other words that not only represented a common pool of positive evaluative meaning (à la Staats and Staats), but also held the potential of evoking pleasant affect associated with winning (Isen et al. 1978). By Allen and Madden’s (1985) distinction, the US thus could effect both the “transference of evaluative meaning” (p. 302) and “direct affect transfer” (p. 303).

Proper conditioning procedure also entails careful attention to the format and number of CS/US pairings. As McSweeney and Bierley (1984, p. 623) state, “... the CS must predict the US for classical conditioning to be effective. The better the CS predicts the US, the better the conditioning will be.” Use of the computer game facilitated establishment of the proper predictive relationship. The strength of the conditioned response also may be affected by the number of CS/US pairings (McSweeney and Bierley 1984). Ten repetitions were built into the game. This level was chosen on the basis of related work in which 10 or fewer trials yielded sub-

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2Proper temporal arrangement of CS and US appears crucial for producing conditioned learning. Generally, a simple simultaneous presentation of CS and US, or a backward presentation (i.e., where the CS follows the US), does not produce conditioning (cf. McSweeney and Bierley 1984; Schwartz 1978).
Experimental Disguise

Conditioning studies often involve procedures that give subjects a realistic sense of purpose; in such instances, elements of the procedure may serve as clues for discerning the study's objectives. To inhibit this propensity to hypothesis-guess, an experimental guise was created.

In recruiting, the project was described as pertaining to the use of foreign words as brand names. Concerns were presented about a problem in which, after repeated exposure to foreign brand names, consumers begin to form brand evaluations with no true usage experience. Our goal was described as an attempt to identify the kinds of foreign words that are particularly susceptible to spurious meaning development.

Experimental Design

The study was designed with a two-component treatment condition and a control group. In the treatment, two counterbalanced “winning schedules” were used to guard against spurious word effects. As shown in the following tabulation, subjects in component A always got the “correct answer” for the word Nedpa, but never were “correct” when Rykke was the focal word. This schedule was reversed in component B.

<table>
<thead>
<tr>
<th>Word</th>
<th>Component A</th>
<th>Component B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nedpa</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Glatt</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>Igjen</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Trygg</td>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>Rykke</td>
<td>0</td>
<td>100</td>
</tr>
</tbody>
</table>

Treatment subjects were informed of a “correct response” by positive evaluative phrases. For an “incorrect response,” no feedback was given. Control group members experienced the same game sequence as those in the treatment, but received no “correctness” feedback.

Sixty-one people were recruited via cash lottery from first-year MBA courses. Twenty-one were run in each component of the treatment condition and 19 were processed as controls. More persons were processed in the treatment group because of the anticipated shrinkage in cell sizes that occurs in post hoc awareness analysis.

Procedure

Subjects were processed by means of Zenith 150 personal computers placed in each of four rooms. Upon arrival the subject was greeted by an experimenter who led him or her to a randomly assigned room. The subject was informed that the study would be conducted via personal computer and was instructed to press any letter to begin. The experimenter then left the room and closed the door. The computer presented this introduction.

A Study on the Development of Spurious Meaning Inherent in the Use of Foreign Brand Names

The study you are about to participate in concerns the issue of whether spurious meaning-development is a problem when utilizing foreign words for brand names. That is, do consumers begin to attach or associate meaning to foreign words when they are exposed to them frequently, even though they have no actual knowledge or experience with the brand in question? To allow us to examine this issue, we would like you to play a computer game. The game is merely a device that allows us to expose you to several different Norwegian words. To simulate the marketplace phenomenon of repeated exposure, each of these Norwegian words will be the focus of the game on numerous occasions. After playing the game you will be asked a series of questions about each word.

Subjects then were taught the game. Each play began with a three-second presentation of 12 letters. After this string disappeared from the screen, a five-letter Norwegian word appeared. The subjects' task was to press the “y” key if they thought the Norwegian word could be spelled with letters from the string or “n” if they thought not. In fact, the speed of the game had been calibrated in pilot work to make this task virtually impossible—the letter strings came and went too rapidly. Though players' answers in no way influenced their winning rates, the program did record the plays. Subjects' responses were used to check the assumption that the game's pace would not allow mastery of the task.

The computer taught participants by using one, and then four, practice trials. Subjects were taught to respond quickly with their first inclination. The game then began and consisted of 50 plays—10 for each word. When a win was scheduled, the subject's response was followed by an evaluative phrase. The Norwegian word (the CS) and this positive phrase (the US) then were displayed together for five seconds.

After 50 plays several measures were taken by the computer. First, subjects gave an attitudinal evaluation for each word. Next, they responded to a mood index. Last, they rated the appropriateness of each word as a possible brand name for a new men's cologne. Subjects then were instructed to find an experimenter and were taken to another private room where a postexperimental inquiry (PEI) instrument was completed. After the PEI, a card was filled out for the lottery and participants were asked not to talk about the experiment with their classmates. All subjects were eventually debriefed in class.

Measurement

For each measure, 7-point scale items were displayed one at a time on subjects' screens. Word evaluations were derived via a semantic differential; endpoints were good/bad, positive/negative, unpleasant/pleasant, and likeable/unlikeable. Coefficient alpha for this scale is .87. The mood scale also consisted of four items. Subjects were prompted with the phrase “at this moment I am...”
feeling" and responded on items with endpoints good/bad, unpleasant/pleasant, happy/sad, and negative/positive. Coefficient alpha is .72. Ratings of each word as a cologne brand name involved a semantic differential with appropriate/inappropriate, undesirable/desirable, and fitting/not fitting as endpoints; alpha is .86.

The PEI (see Appendix) served two purposes. It was designed to detect suspicions about the preprogrammed winning schedules and it gauged contingency and demand awareness. Questions 1 and 2 were used to assess whether the experimental guise had been accepted. Question 3 was asked to determine whether subjects detected that the computer was providing inaccurate feedback. Questions 4 and 5 checked the credibility of, and familiarity with, the Norwegian words. Questions 6 and 7 gauged general contingency awareness and asked for an indication of when it occurred. Questions 8 and 9 were critical tests of contingency awareness and 10 assessed demand awareness.

Results for the Conditioning Manipulation

Two assumptions were made that could have implications for interpreting observed effects. First, we assumed that individuals would not master the game. Responses were analyzed and chi square tests showed that four players performed at a better-than-chance level. Of these, just one indicated suspicion on question 3 of the PEI. Generally, the pace of the game prevented mastery and suspicion.

The second assumption was that the moods of the control and treatment groups would be equivalent when key dependent measures were taken. Subtle differences in feeling states may act as a confound in the interpretation of conditioning effects (Allen and Madden 1985). However, the mood measure indicated no difference between treatment and control subjects ($t(59) = 2.17$).

Two analyses were used in assessing conditioning effects. Between-group tests compared treatment means with control group means. The two components of the treatment group were collapsed and tested against the control's averaged evaluation for the corresponding pair of words. That is, treatment group subjects' evaluations for words that always predicted a win (Nedra or Rykke) were compared with the averaged evaluation of these two words for control subjects. Within-group tests compared subjects' evaluations for words they always won with and those they never got correct.

The two tests yielded comparable results. For the word evaluations, between-group ($\bar{X}(100\%) = 18.76, \bar{X}(control) = 15.85; t(59) = 3.11, p < .003, \omega^2 = .15$) and within-group tests ($\bar{X}(100\%) = 18.76, \bar{X}(0\%) = 14.98; t(41) = 4.08, p < .001, \omega^2 = .27$) are significant statistically. Higher means indicate more favorable evaluation—thus conditioning appears to have occurred. Similar analyses were performed on ratings of the words as brand names for a cologne. Significant effects are not found in either the between-group ($\bar{X}(100\%) = 11.1, \bar{X}(control) = 10.29; t(59) = .62, p > .50$) or within-group ($\bar{X}(100\%) = 11.1, \bar{X}(0\%) = 9.74; t(41) = 1.34, p > .18$) tests.

Post Hoc Awareness Analysis

Following the tradition in attitudinal conditioning studies (e.g., Page 1969), we assessed the association between awareness categories and observed effects. As the within- and between-group tests again yielded redundant findings, just the between-group results are discussed.

PEI responses were used in classifying treatment group subjects into one of three categories: (1) unaware, (2) contingency but not demand aware, or (3) contingency and demand aware. Three judges (not the authors) made the classifications. To be classified contingency aware, subjects had to answer "yes" on question 6 (see Appendix), state on question 7 that they noticed as they played that some words were easier, and report in question 8 the CS that always predicted a win. Twenty-two subjects were classified unaware and 20 were classified contingency aware. Contingency-aware participants also were examined for demand awareness. To be classified demand aware these subjects had to respond "yes" on question 10 and demonstrate in either question 1, 2, or 10 that they had some sense of the experimental hypothesis and had acted to confirm it. Six participants were classified demand aware.

Overall interjudge reliability was .88; disagreements were broken by majority rule.

The between-group tests entailed comparisons of word-evaluation means in each awareness category against the control value. For unaware subjects, the test proved nonsignificant ($\bar{X}(100\%) = 17.69, \bar{X}(control) = 15.85; t(39) = 1.54, p > .10$). However, tests involving the contingency-aware ($\bar{X}(100\%) = 19.22, \bar{X}(control) = 15.85; t(31) = 2.40, p < .025, \omega^2 = .13$) and demand-aware ($\bar{X}(100\%) = 21.67, \bar{X}(control) = 15.85; t(23) = 3.39, p < .003, \omega^2 = .34$) groups are significant.

Discussion

The word-evaluation results uphold the efficacy of basic Pavlovian procedures in shaping attitude. Two empirically based arguments can be offered to refute a demand artifact interpretation. One involves the PEI data. A small group of subjects saw through the experimental guise and "supported" the conditioning hypothesis. However, when their responses were removed from the analysis, evidence remained for conditioning among those who were contingency but not demand aware.

The second argument entails a comparison of results for the two dependent measures—word evaluations versus brand-name ratings. If artifact were the sole factor driving participants' responses, its impact should be uni-

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2Because judges were asked to look for an indication that the subject had recognized and acted to confirm the experimental hypothesis, one could argue that this group is something more than simply demand aware. They guessed the hypothesis and also adopted what Sawyer (1975) refers to as the "good subject" role in their effort to confirm it.

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form across dependent measures. That is, it seems unlikely that upon guessing the experimental hypothesis a subject would decide to support it on one dependent measure but not the other. The fact that the conditioning procedure affected word evaluations, but not brand name ratings, seems to rule out the possibility that the findings merely reflect a global "yes-saying" response.

Among subjects classified unaware, a statistically significant effect is not observed; on the surface, this finding appears to corroborate Bandura's (1974, p. 859) contention that "people do not learn despite repetitive paired experiences unless they recognize that events are correlated." However, though Bandura implies that contingency awareness has a causal role in conditioned learning, this post hoc analysis supports only an associative inference. One could argue that the data merely illustrate an epiphenomenon that accompanies noncognitive conditioning (cf. Staats 1969). Indeed, as Page (1974, p. 476) concludes, "... postexperimental questionnaire data taken alone should not ordinarily be used in a strong argument. However ... postexperiential data can be very helpful in suggesting ... hypotheses for experimental manipulations." Following Page's suggestion, we designed a second study to supply more information about the causal role of contingency awareness in conditioning.

**EXPERIMENT 2**

Experiment 2 again employed the computerized word game, but with three new manipulations. One of them was an attempt to strengthen the conditioning procedure used in experiment 1 without increasing contingency or demand awareness. The second was an attempt to heighten contingency but not demand awareness and the third manipulated demand awareness.

**Experimental Manipulations**

The first manipulation was chosen to provide a "better" opportunity for noncognitive conditioning to occur. Recall that results of the post hoc analysis are nonsignificant for the unaware group (X(100%) = 17.69, X(control) = 15.85; t(39) = 1.54, p > .10), but the direction of the means is consistent with the conditioning hypothesis. Increasing the potency of the procedure without raising awareness levels would furnish an interesting test of the conditioning-without-awareness position.

One obvious approach for strengthening the procedure is to add repetitions, but it poses the repetitions dilemma—as repetitions increase, so may contingency and demand awareness. To strengthen the manipulation, we followed McSweeney and Bierley's (1984, p. 626) suggestion that "conditioning will also be better... for longer intertrial intervals." This interval is simply the time between successive CS/US pairings. In the new manipulation the average intertrial interval was doubled by adding 50 dummy plays—one between each original play. These plays involved five additional Norwegian words; subjects received "correct" feedback for the dummy words 50% of the time.

The other two manipulations did not involve alterations in the original game—changes came through instructions to subjects. To assess the causal impact of contingency awareness, instructions were used to promote learning of the CS/US contingency. These instructions were also designed to suppress demand awareness by leading participants to anticipate that some words would be easier to get correct than others. The logic was that a priori legitimization of the differential winning rates would further reduce suspicions about them and inhibit hypothesis-guessing. The third manipulation employed instructions designed to heighten demand awareness. The experimental hypothesis was communicated to subjects before they played the game.

**Subjects and Design**

Experiment 2 was conducted three months after experiment 1; second-year MBAs were recruited. Seventy-eight subjects were processed, with 26 assigned randomly to each condition. Because the within- and between-group tests in experiment 1 yielded comparable results, a control group was deemed unnecessary.

**Procedure and Measurement**

Subjects were run with the same facilities and procedures used previously. The extended intertrial interval manipulation was created by inserting 10 presentations for five additional words.

The contingency-aware manipulation involved new instructions; the following paragraph was inserted in the game's introduction.

In our attempt to determine the reasons for spurious meaning-development, we have found different words are more or less troublesome for different people. Our experience indicates that some words will be easier than others to get correct in the game you will play. We have found the words that are easiest and hardest to get correct vary by individual. As you play, try to keep track of the words that prove especially easy or difficult for you. We will ask you to tell us which words you found easiest and hardest after the experiment is completed.

Just before beginning play subjects were again reminded to note words that were especially easy or difficult for them. For the demand-aware condition, the following paragraph was inserted in the introduction.

In our attempt to determine the reasons for spurious meaning-development, we have found different words are more or less troublesome for different people in the game you will play. We have also found that the words people consistently perform better on are the words that they rate more positively (and vice versa with difficult words). Do not be concerned if you find your ratings are influenced by the ease or difficulty of getting a word correct. It is a common experience we have come to
ASSESSING THE ROLE OF CONTINGENCY AWARENESS

expect as a result of using this game to investigate spurious meaning-development.

Before starting play, subjects were reminded that they would develop an evaluation bias attributable to their success rates.

The mood scale was dropped; otherwise, all measures were identical to those used before. Word evaluations and brand name ratings were collected for the same words used in experiment 1; alphas for these scales are .89 and .86. The session again ended with the PEI (see Appendix).

Results

As in experiment 1, we assumed that the game’s pace would prevent mastery. Analysis of individuals’ plays showed that only one person performed at a better-than-chance level. The assumption that participants did not become suspicious of the preprogrammed winning schedule again appears reasonable.

Though the thrust of experiment 2 was to avoid the ambiguities inherent in post hoc analyses, the PEI data have value as a manipulation check. With one exception, subjects were classified as unaware, contingency aware, or demand aware by the same criteria as before. The exception was the demand-aware classification for the demand awareness treatment. This group was told the research hypothesis before they played; thus, if they otherwise satisfied all requirements for contingency awareness, they were presumed to be demand aware. Results of the awareness classification by treatment group are reported in Table 1.

Within-group tests were examined for word evaluations and brand name ratings. In the extended intertrial interval group there are no effects on word evaluations (\(\bar{X}(100\%) = 18.57, \bar{X}(0\%) = 18.32; t(25) = .17, p > .85\)) or brand name ratings (\(\bar{X}(100\%) = 12.77, \bar{X}(0\%) = 12.85; t(25) = .12, p > .90\)). In the contingency-aware treatment there is an effect on word evaluations (\(\bar{X}(100\%) = 18.30, \bar{X}(0\%) = 15.35; t(25) = 1.89, p < .05, \omega^2 = .09\)), but not on brand name ratings (\(\bar{X}(100\%) = 12.50, \bar{X}(0\%) = 12.27; t(25) = .18, p > .80\)). In the demand-aware condition significant effects are found for both word evaluations (\(\bar{X}(100\%) = 18.85, \bar{X}(0\%) = 15.89; t(25) = 2.43, p < .02, \omega^2 = .14\)) and brand name ratings (\(\bar{X}(100\%) = 12.20, \bar{X}(0\%) = 9.77; t(25) = 1.90, p < .05, \omega^2 = .09\)).

Discussion

The data do not corroborate the view that conditioned learning comes about through a noncognitive process. A manipulation chosen to strengthen the procedure without increasing awareness levels yielded no learning. Conversely, the manipulation designed to promote contingency learning in conjunction with the conditioning procedure did produce a statistically significant effect.

Two arguments can be offered to refute demand artifact interpretations for the contingency-aware condition. First, notice in Table 1 that the number of subjects who became demand aware in this condition is low and equals the number in the extended intertrial interval condition. Demand awareness thus does not offer a rival explanation for the difference in word evaluations between these groups.

Second, as argued previously, if artifacts were responsible for the observed effects one would expect effects on both word evaluations and brand name ratings. This outcome is demonstrated in the demand-aware condition where significant effects are documented on both measures. Because statistical significance is found on just the word evaluations in the contingency-aware condition, this effect seems unlikely to be merely a global “yes-saying” response.

GENERAL DISCUSSION

Our project furnishes no evidence for the conditioning-without-awareness position. In experiment 1, the observed effect is not present among subjects classified unaware. In experiment 2, the manipulation designed to strengthen the conditioning procedure that had been used in experiment 1, though inhibiting increases in awareness, yielded no effect. Arguing that nonsignificant results support anything is problematic, and we do not contend or imply that this lack of significance disproves noncognitive conditioning. Like other researchers (e.g., Bandura 1974; Dawson 1973; Dawson et al. 1982; Gringles 1973; Hall 1976; Hare 1964; Insko and Oakes 1966; Page 1969, 1974; Perruchet 1985; Rozelle 1968), we suggest that it is difficult to demonstrate conditioning without awareness. If research on subliminal perception provides any guide (e.g., Holender 1986; Merikle and Chase 1987), there is reason to believe that studying “pre-conscious,” “automatic,” or otherwise “noncognitive” processes will remain perplexing.

Table 1

<table>
<thead>
<tr>
<th>Awareness classification</th>
<th>Treatment</th>
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<tr>
<td></td>
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<td>Extended</td>
<td>Contingency</td>
<td>Demand</td>
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<td>Unaware</td>
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<td>condition</td>
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<td>Contingency but not</td>
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<td>9</td>
<td>13</td>
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<tr>
<td>Contingency and</td>
<td>8</td>
<td>14</td>
<td>0</td>
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<td>demand aware</td>
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<tr>
<td>Totals</td>
<td>26</td>
<td>26</td>
<td>13</td>
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</table>
Our data demonstrate an association between contingency awareness and attitudinal conditioning. In experiment 1, the significant effect held among subjects classified contingency aware. In experiment 2, instructions that fostered contingency learning as part of the procedure yielded a significant effect. These findings are consistent with research indicating that contingency learning does have a causal role in conditioning (e.g., Dawson 1973; Dawson et al. 1982; Grings 1973; Hall 1976).

Ascribing causality to contingency learning manifested as conscious awareness of the CS/US pairing pattern invites a view of classical conditioning as a cognitively mediated process. However, we do not suggest that conditioning entails careful or deliberative thought processes; to the contrary, though conditioning procedures may begin to affect individuals’ attitudes only after they have learned the CS/US contingency, this fact need not imply that they are aware of the effect. As Nisbett and Wilson (1977, p. 247) note, “... even when people are cognizant of the existence of both stimulus and response, they appear to be unable to report correctly about the effect of the stimulus on the response.” Though attitudinal conditioning appears cognitively mediated, automatism remains in the sense that individuals may not be cognizant of how stimulus pairings they (knowingly) encounter influence their attitudes.

The findings also make a rather clear point about demand artifact. Some subjects are likely to guess the experimental hypothesis in conditioning studies, even when explicit steps have been taken to disguise the research purpose. Ignoring demand-aware subjects will increase the likelihood that one’s data will “support” a conditioning hypothesis.

THEORETICAL IMPLICATIONS

Our project supports the salience of contingency learning in attitudinal conditioning, but many adjustments for strengthening the procedures used here might be tested (McSweeney and Bierley 1984). Perhaps a stronger procedure would reveal a noncognitive mechanism. We emphasize, however, that ours is not the first project to implicate contingency awareness as a requisite for conditioned learning (cf. Baer and Furhner 1982; Biferno and Dawson 1977; Dawson et al. 1982; Grings 1973; Rescorla 1988). Indeed, we concur with Dawson (1973, p. 85) that a construct like contingency awareness “must be incorporated into any complete conditioning theory.” Moreover, a case can be made that contingency awareness will be germane to theory building for applied settings if it is treated as a hypothetical construct. This case requires a conceptualization of classical conditioning as a cognitive, sequence-learning process (cf. Bandura 1974; Dawson et al. 1982; Perruchet 1985; Tolman 1932; Woodworth 1958).

Tolman (1932) was probably the first psychologist to portray classical conditioning as a sequence-learning process. He contended that Pavlov’s dogs acquired an “expectation to the effect that waiting in the presence of the sign-object—color or sound—would lead to the signify—food” (p. 331). In this process the CS is viewed as arousing an orienting reflex that produces anticipation about “what’s next” (Perruchet 1985; Woodworth 1958). With repetition, the US becomes the answer to this implicit question (Dawson et al. 1982). Thus, in successful conditioning, the CS creates an expectation that leads the subject to anticipate and predict the US. For the human subject, this learned relationship may achieve accessibility at a conscious level that is manifested as contingency awareness (Dawson et al. 1982).

Forming theoretical terms (such as “contingency awareness”) as hypothetical constructs has advantages. As summarized by Zuriff (1985, p. 78), “... hypothetical constructs facilitate theoretical reduction, they provide more satisfactory understanding, and they are heuristiclly fertile.” Such advantages are apparent when classical conditioning is conceived as sequence learning that yields contingency awareness. For example, many Pavlovian laws can be interpreted as compatible with this conceptualization. McSweeney and Bierley’s (1984, p. 623) conclusion that “the better the CS predicts ... the better conditioning will be” might be rephrased as “the better the CS predicts, the faster the sequential learning process will transpire to produce contingency awareness.” Empirical arrangements of the CS and US that yield “overshadowing” or “blocking” (McSweeney and Bierley 1984; Schwartz 1978) and disrupt conditioning might be interpreted as involving CS/US arrangements that confound sequence learning. Hence, contingency awareness seems useful as a theoretical abstraction that enhances understanding of Pavlovian laws.

Theoretical abstractions are valuable to practitioners because they supply understanding that can be translated into diverse contexts (Calder, Phillips, and Tybout 1981). Our project demonstrates that structuring the presentation of a neutral stimulus with a positively evaluated stimulus can affect individuals’ attitudes. It is not difficult to extrapolate this attitude-formation mechanism into an advertising domain; furthermore, illustrating the heuristic fertility of the contingency awareness construct for advertising applications is straightforward. Before discussing these application issues, we address the limitations of the research.

RESEARCH LIMITATIONS

All research designs involve validity tradeoffs; internal validity was the principal priority in designing our two experiments. Heavy emphasis on internal validity typically comes at the expense of ecological validity. In this section we specifically discuss how the tasks subjects performed in the studies might differ from ad processing in natural settings. First, however, we comment on why internal validity was given priority.

To understand our design priorities it is useful to consider the following question about the marketing field’s treatment of attitudinal conditioning: Why has a field that has invested such substantial resources in studying atti-
tude formation ignored extant research on attitudinal conditioning? Even the latest generation of consumer behavior texts (e.g., Engel, Blackwell, and Miniard 1986; Peter and Olson 1987) continue to feature Pavlov's experiments with salivating dogs while ignoring research on the conditioning of attitude. Though there may be many reasons for this indifference, a major one certainly is related to how attitude conditioning has fared among social psychologists. Internal validity problems with the Staats's (1957, 1958, 1959) seminal experiments led influential authors (e.g., Fishbein and Ajzen 1975, p. 277–80) to favor Page's (1969, 1974) demand artifact interpretation. The demand artifact issue effectively stifled research on attitudinal conditioning in social psychology, and possibly in marketing as well. Without a careful treatment of the artifact question, we saw little chance that the marketing field would reconsider its inherited disinterest in the conditioning of attitude. Hence, concern about demand artifact motivates the priority on internal validity (Calder, Phillips, and Tybout 1981; Sawyer 1975).

The computer game was developed as a means for unobtrusively administering a conditioning procedure. The game facilitates structuring the arrangement between conditioned and unconditioned stimuli without giving participants the impression that this arrangement was predetermined or controlled. Attitudinal conditioning occurred as an incidental byproduct of task performance, as it might occur as a result of incidental exposures to television advertisements. However, major differences between the computer game task and naturalistic ad-processing situations preclude direct generalizations. One could argue that this artificial task was biased toward production of conditioned learning; conversely, one might contend that it was an impoverished procedure with nothing close to the potential potency of an advertising campaign. Let us examine both of these positions.

Several procedural features could have produced learning levels that would be unique to the project. The CSs were selected to be unfamiliar and neutral attitude objects—an ideal situation for shaping attitudes. Brand attitudes for parity products in uninvoking categories can be labile; however, even weakly developed brand attitudes are likely to be more difficult to influence than attitudes toward unfamiliar words. In addition, as the centerpiece of the game, the Norwegian words should have been a continual focal point of players' attention. Though attention levels may have fluctuated over the course of the game, one still would suspect that brand names are never accorded such consistent attention in mass-media advertising. Our neutral, highly salient CSs certainly facilitated conditioning and using MBAs as game players also may have contributed. MBA students are likely to be more competitive and have greater cognitive skills than the general population. If so, contingency learning might be expected to occur more rapidly in a sample of MBAs than in the population at large. If contingency learning is a prerequisite for conditioning, the

use of MBAs may have inflated the observed effects.

In contrast, one might view the laboratory procedure as impotent in comparison with the possibilities offered by television advertising. Advertisers can use powerful imagery and combine it with compelling music to create unconditioned stimuli that would be substantially more evocative than the evaluative feedback used as the US in our experiments. Additionally, over the course of a campaign, advertisers may benefit from repetition levels that far exceed the 10 CS/US exposures we used. Stronger USs combined with prodigious repetition levels administered over time contribute to the relative potency of advertising as a natural conditioning mechanism.

The differences between this laboratory setting and real ad exposure environments are substantial; caution is appropriate in drawing conclusions for marketing practice. However, our data do indicate that contingency learning may have an important role in attitudinal conditioning. In the next sections we illustrate the potential value of the contingency awareness construct in advertising applications and suggest directions for further research featuring this construct.

ADVERTISING APPLICATIONS

We examine a basic mechanism for shaping attitudes that may be operative in advertising contexts and extend prior theorizing by introducing the contingency awareness construct as salient for such contexts. This construct furnishes a simplifying focal point for ad construction. Rather than trying to interpret and accommodate a variety of Pavlovian laws, the advertiser can concentrate on effecting contingency learning when building ads with an intent to affect brand attitudes. In general, proper conditioning mechanisms should involve repeated presentation of the brand (i.e., the CS) to stimulate anticipation. Via repetitive sequential arrangement, the viewer should be taught to expect the US (e.g., an attractive visual image) after each CS presentation. The learning of this relationship should increase the likelihood of attitude formation. An anecdotal example may help clarify this notion of "proper conditioning mechanics."

Strong Versus Weak Conditioning Mechanisms

Two 1983 Clio Award–winning commercials are described as illustrations a 30-second ad for Diet Pepsi that demonstrates strong conditioning mechanics and a 60-second ad for Calvin Klein Activewear that does not.

Diet Pepsi. This commercial features a repetitive musical jingle with a series of brief visual clips. The jingle lyrics—"Now you see it, now you don't, here you have it, here you won't"—are precisely coordinated with the image presentation. The ad contains four conditioning

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3We have no way of knowing the advertisers' actual communication objectives for either of these ads and are not contending that one ad was more effective than the other. These ads were selected merely to illustrate that it is realistic to discuss implementation of "proper versus improper" conditioning mechanics in traditional advertising contexts.
trials where the CS (the brand) predicts the US (a slim female torso). In each instance “Now you see it, now you don’t” is sung as first the brand (CS) and then a trim-figured woman (US) is shown. Hence, the CS predicts the US and the jingle lyrics teach the viewer to anticipate the US after each CS. Using the jingle in this way fosters the anticipation and prediction that are central to the sequence-learning view of conditioning. It is easy to imagine that many viewers of this ad would have consciously recognized a CS/US pairing pattern—simply stated, they would have become contingency aware.

Calvin Klein Activewear. Like the Diet Pepsi ad, this award winner appeals to the virtues of a trim figure. It is built around a series of closeups of a woman exercising and then changing into street clothes. The product category and brand name are mentioned only at the end. The ad is novel but does not use a structured, sequential relationship between CS and US. In fact, it is difficult to say what the US would be. Typically, this “mini-drama” ad style—which often is used as a means for delivering emotional appeals—does not include CS/US sequencing that would promote contingency learning.

Fostering Contingency Learning in Television Advertisements

Creating proper CS/US arrangements in 30-second television commercials can be straightforward. Short clips of visual imagery that are evocatively positive and/or emotionally evocative furnish basic building blocks (cf. Stuart, Shimp, and Engle 1987) for constructing ads with sound conditioning mechanics. As USs, these images should effect the “transference of evitative meaning” and/or “direct affect transfer” that are the core of attitudinal conditioning (Allen and Madden 1985). Treating contingency learning as a requisite in the process implies that an ad should lead the viewer to expect and predict a very specific image or set of images after each brand presentation.

The implication of a noncognitive conditioning process is that one need merely to expose the viewer to a series of CS/US pairings for attitudes to be affected. Conversely, if contingency awareness is necessary, television commercials adopting a conditioning format should include tactics designed to focus attention on the CS/US arrangement to promote recognition of the pairing pattern. Generally, attention is presumed to be ephemeral (e.g., Kahneman 1973) and in real-world ad-exposure contexts capricious attention seems a given. Using nonverbal cues, voice-overs, and/or background music in an effort to fluctuate and direct attention during ad viewing could foster contingency learning and, presumably, affect brand attitude.

Research on how message tactics are used to activate and direct attention at specific instances in an ad provides some suggestions for building ads that promote contingency learning. For instance, alterations in the visual imagery (via zooms, pans, or slow motion), actor movements and facial expressions, and auditory fluctuations (e.g., start of voice-over, pace changes in the voice-over, changes in pitch or tempo of the background music) have all been linked to shifts in arousal during ad processing (cf. Alwitt 1985; Haley, Richardson, and Baldwin 1984; Reeves et al. 1985). In general, each of these tactics has the potential to disrupt information flow. Such variations in the continuity of the presentation often yield an orienting response that directs attention to the stimulus. Using such tactics to direct attention to the CS/US pairings may activate the minimal cognitive resources required for contingency learning.

Ad Evaluation and Contingency Awareness

One appropriate application of contingency procedures appears to be in shaping brand attitudes for uninvolving, parity products (Gorn 1982; Shimp 1981). In this context contingency awareness gives the advertiser an intermediate goal that may have further value as a focus in the ad evaluation process. For example, copy tests could be developed to assess the relative effectiveness of rough versions of commercials for producing contingency awareness. Note that contingency awareness was gauged in our project with a simple recall measure. In ad testing, subjects might be asked to recall the images they remember being associated with the brand name in a specific ad execution. We speculate that the most informative procedures would try to assess recall of those very specific images employed in the execution. However, such a task could prove very demanding if individuals were asked to verbalize recollections of fleeting, rapidly paced image sequences. The recognition measure advocated by Singh, Rothschild, and Churchill (1988) may be better suited to gauging contingency learning when nonverbal ad cues serve as the USs.

DIRECTIONS FOR FUTURE RESEARCH

In recent years, several authors have discussed general implications of the conditioning framework for advertising research (Allen and Madden 1985; McSweeney and Bierley 1984; Stuart, Shimp, and Engle 1987). In this concluding section we focus more specifically on the contingency awareness construct and its research implications. As Calder, Phillips, and Tybout (1981, p. 198) have observed, “... theories [do not] specify how their abstract constructs can be embodied in real-world interventions.” Thus, conclusive recommendations about how advertising tactics will be most effective for enhancing contingency learning must await a research stream developed around the intervention-testing agenda. Such a stream should place higher priority on ecological validity without totally ignoring the demand artifact issues that have confounded inferences in some prior work.

The challenge for future research is communicated best with a reference to experiment 2. In that study instructions designed to promote contingency learning were given to some subjects—the procedure influenced those subjects’ attitudes about the CS. Advertisers obviously cannot give consumers instructions to promote contingency
awareness, but diverse message tactics designed to activate and focus attention at key points in the ad could be tested as real-world interventions. Empirical research should be helpful in deciding which message structures and what execution tactics are most effective in producing contingency awareness. Also, the structure or tactic used in an ad may gain or lose potency with multiple exposures to that ad. Thus, important issues pertaining to the effects of repetition could be incorporated into this research stream.

A productive experimental paradigm for this intervention testing might be developed by extending the procedures used in Stuart, Shimp, and Engle’s (1987) recent project. Stuart and her colleagues used a procedure featuring fictitious brands as CSs and pleasant natural scenes as USs. Proper CS/US sequences were arranged via a meticulous color-slide presentation; this approach proved effective in shaping subjects’ attitudes. Adopting this sort of imagery presentation for use with VCR equipment would be straightforward and provide several advantages. The VCR format would not only allow for sound generalizations to television-advertising applications, but also furnish the precise control one needs in creating and testing alternative CS/US arrangements. Additionally, the VCR format could facilitate testing of different tactics for accelerating contingency learning. For example, background music, voice-overs, pace changes, camera movements, timing of CS/US pairings, number of CS/US pairings, extraneous imagery, and a variety of other executional variables could be assessed as interventions for effecting contingency awareness.

Incorporating the contingency awareness construct into an attitudinal conditioning framework motivates a variety of empirical questions. This set of questions differs from those typically studied by marketing researchers in that they converge on issues involving the mechanisms of ad construction. Research in the seam between cognitivism and behaviorism offers a unique agenda for knowledge development that could yield important, pragmatic insights.

APPENDIX

POSTEXPERIMENTAL INQUIRY INSTRUMENT

We are interested in your evaluation of the clarity of the instructions given in this study. We are also interested in your honest perception of what the purpose or goal of this study was.

1. Summarize below what you believe was the purpose of this study.

2. During the study, did you ever have a thought that its purpose might be something other than what you were told? If so, when did this occur to you and what were you thinking?

3. Did you find anything confusing or peculiar about the computer game? If so, what?

4. Did you have any doubt that the five focal words in the study (i.e., NEDPA, GLATT, IGEN, TRYGG, and RYKKE) were real Norwegian words? If yes, what made you suspicious?

5. The five words are real Norwegian words. Did you know the meaning of or have any prior familiarity with any of the five words? If so, which ones?

APPENDIX—(Continued)

6. As you played the game, did you perceive that it was easier to get the "correct" answer for some of the five words as compared to the others? Yes/No.

7. If you answered yes on the question above, when did you start thinking about how hard or easy it was to get the correct answer for the various words (i.e., just now, or some time during the study be as specific as you can in indicating when you started thinking about this issue)?

8. Which word did you find it easiest to get a correct answer for?

9. Which word did you find it hardest to get a correct answer for?

10. After playing the game you were asked to evaluate each word. Were any of your evaluations influenced by how easy or difficult it was to get a correct answer for that word? Yes/No.

11. If you answered yes above, explain how your answers were influenced.

REFERENCES


Dawson, Michael E. (1973), “Can Classical Conditioning Oc-


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