Reinforcement in the Sixteenth Century: Was the Bard a Behaviorist?

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Shakespeare's play *The Taming of the Shrew* is described in terms of behavior analysis. Changes in the behavior of the character Kate result from her husband Petruchio's manipulation of environmental contingencies. Aspects of behavior analysis found in the play include the identification of target behavior, the establishment of events as reinforcers, the arrangement of contingencies between responses and reinforcers, and the assessment of post-intervention responding. Several aspects of Shakespeare's description are related to current issues in behavior analysis bearing on theory, cultural practices, and public relations.

Key words: Literary Analysis, Applied Behavior Analysis, Verbal Behavior, Shakespeare

Psychologists have often attempted to analyze works of literature for psychological content. For example, Freud's analysis of the Oedipus myth (Freud, 1955/1913) and Jung's interpretation of mythological symbolism (Jung, 1953/1944) document the psychological content of mythology from psychodynamic viewpoints. Behavioral psychologists, in contrast, have lagged behind psychoanalysts in their attempts to analyze literature. When behavioral psychologists have examined literary topics, the emphasis has usually been on the behavior of a particular author or artist (e.g., Skinner, 1934, 1939). Other works with obvious behavioral interpretations were expressly written to illustrate behavioral points (Skinner, 1948). The possibility exists, however, that some literary portrayals of human behavior exemplify behavioral principles without having been designed to do so.

The present paper is an attempt to describe a work of Shakespeare from a be-

havioral point of view. As others have noted, the works of Shakespeare often show considerable insight into the laws of behavior (Blampied, 1985). Although many Shakespearean works could provide fertile ground for a behavioral analysis, *The Taming of the Shrew* was chosen for the present analysis because it is an especially clear illustration of behavioral principles at work.

A "behavioral analysis" of a literary work such as *Shrew* might be conducted on any number of levels. On the simplest level, such an analysis could show that the behavior of the characters is generally consistent with a behavioral perspective. On a slightly more complex level, the analysis could relate events in the play to issues of theoretical interest to the behavior analyst. On a still more complex level, the analysis could identify quantitative relationships between the frequency of certain responses by characters and the frequency of related reinforcing events. The present paper will focus on the relatively simple assertion that Shakespeare's descriptions are consistent with a behavioral analysis. Some aspects of his descriptions do shed light on current issues in behavior analysis, and these will be discussed briefly. Although more complex analyses are certainly possible, they are beyond the scope of the present paper.

The analysis is presented in four parts. First, the relevant elements of behavior analysis are reviewed. Second, a brief

Skinner has written of "Having a Poem." In turn, I have received so much important feedback on this paper that it is truly an example of "Having a Manuscript." I wish to thank Valeri Farmer-Dougan, Fran McSweeney, Blaine Peden, Bill Timberlake, Julie Vargas, journal editor-elect Sigrid Glenn, and several anonymous reviewers for their comments on the manuscript. I would also like to particularly thank Dr. Walter Broman, whose undergraduate Shakespeare class inspired this paper many years ago. Requests for reprints should be addressed to James D. Dougan, Department of Psychology, Indiana University, Bloomington, IN 47405.

synopsis of the play is given. Third, examples of behavioral principles exemplified in the play are discussed. Finally, the relevance of the play to current issues in behavior analysis is discussed.

APPLIED BEHAVIOR ANALYSIS

Applied behavior analysis takes many forms, depending on the response under study and the experimental design (Kazdin, 1978). Thus, it needs to be defined before proceeding with a behavioral analysis of *Shrew*. Moreover, because behavior analysis takes many forms, the following discussion will highlight only those aspects that are relevant to the current rendering of the play.

As Baer, Wolf, and Risley (1968) have argued, applied behavior analysis involves a number of definitional characteristics. For the present discussion, it is important to note that applied behavior analysis is *applied* because it addresses socially relevant problems, and *behavioral* to the extent that it modifies observable behavior in an individual subject; moreover, the analysis typically uses strictly defined techniques (a *behavioral technology*) related to a *conceptual system* (e.g., an organizing principle such as reinforcement). The present discussion will focus on the degree to which the events described in *Shrew* are consistent with these aspects of applied behavior analysis. Particular emphasis will be placed on the behavioral technology and conceptual systems typical of applied behavior analysis.

Although reinforcement techniques are not a necessary component of applied behavior analysis, many programs do employ them (e.g., Ayllon & Azrin, 1965). When reinforcement is used in a behavioral program, the design usually has at least four components. First, a target response is designated. That is, a particular response is chosen for reinforcement (or punishment).

Second, the conditions of reinforcement are established. This may involve depriving a subject of the reinforcer, limiting the subject's opportunity to engage in a response, or establishing a token as

a conditioned reinforcer (Kazdin & Bootzin, 1972). Establishing a reinforcer may involve the use of motivational operations (Michael, 1982), or the intervention may be placed within an environment conducive to behavior change.

Third, a contingency is arranged between the target response and the reinforcer. The reinforcer will not be presented until the target response (or some approximation thereof) occurs. This component of the program may include verbal instructions from the teacher, therapist, or partner outlining the nature of the contingencies, or a contract between the parties involved based on those contingencies.

Finally, the effects of reinforcement are assessed by measuring the rate of the target response after intervention. Of particular interest is the post-intervention rate of the target response compared with its rate during the pre-intervention baseline.

A BRIEF SYNOPSIS

*The Taming of the Shrew*¹ is considered to be one of Shakespeare's earlier comedies (Hosley, 1969). Although the exact date of the play's first performance is not known, it is thought to have been presented sometime between 1594 and 1603. The play first appeared in print in Shakespeare's famous folio of 1623. Although *The Taming of the Shrew* is not generally considered by critics to be Shakespeare's greatest literary masterpiece, it ranks as one of his best plays in terms of audience enjoyment (Hosley, 1969).

The plot of *Shrew* is complex, with three simultaneous story lines. The main story line concerns the attempts of young Petruchio to "tame" his wife, Kate. In the opening act, Kate is introduced as the elder of the two daughters of Baptista, a wealthy gentleman. Bianca, the younger daughter, is a perfect Elizabethan lady:

¹ All factual references concerning the play, and all line references, are taken from *The Pelican Shakespeare* (Harbage, 1969).

Shy, gentle, and deferential to her male elders. As such, she has many suitors. Kate, in contrast, is rude and aggressive, hardly a display of the societally specified behavior for a lady. Thus, Kate has no suitors.

The plot becomes interesting when Baptista declares that no man shall court Bianca until Kate, being the elder daughter, has been wed. All of Bianca's suitors vow to discover a man willing to brave Kate's temper. A suitable male is found in Petruchio, who is more interested in marrying into money than he is with the behavior of his wife. Also, Petruchio claims he will have an easy time taming the fiery Kate. The remainder of the play concerns Petruchio's efforts to modify Kate's behavior. By the end of the play, Kate's behavior has indeed been changed. In the final scene, she is pictured as the perfect Elizabethan lady.

The psychological dimensions of Petruchio's method have been noted by literary critics. For example, Hosley (1969) has characterized the method as "driving out poison with poison," which he maintains was common in Elizabethan times. Unfortunately, it is unclear what is meant by "driving out poison with poison," although one interpretation could involve the use of an aversive stimulus (the second poison) to reduce the rate of an undesirable behavior (the first poison). As it stands, however, "driving out poison with poison" is not a satisfactory explanation for the psychologist because it does not make direct contact with any known psychological system. Likewise, such an explanation is not satisfactory within behavior analysis because specific relations between behavior and environment are not clearly specified. As shall be shown below, Kate's transformation is brought about by Petruchio's systematic arrangement of environment-behavior relations.

PETRUCHIO AS APPLIED BEHAVIOR ANALYST

Because behavioral principles had not been scientifically formulated when Shakespeare wrote *Shrew*, it would be incorrect to say that Petruchio used the

principles to manage Kate's behavior. Nevertheless, Petruchio proceeded in ways consistent with applied behavior analysis. Thus, we may consider Petruchio as a pre-scientific craftsman (Lee, 1986) and examine his techniques for their consistency with behavioral principles. As shown below, Petruchio (and other characters) identified target responses, established events as reinforcers, arranged a contingency between responses and reinforcers, and obtained a post-intervention assessment.

Identification of the Target Response

Shakespeare's works rely heavily on the spoken word to convey the actions of the play. Directions involving physical actions are almost completely absent from the text. For this reason, the following descriptions of Kate's behavior are based on the verbal reports of other characters and on Kate's own verbal behavior. Of course, productions of *Shrew* do use non-verbal behavior to portray Kate's character, but these are left to the interpretation of the director and are not part of the text. The present discussion will focus on the text of the play, and thus will rely most heavily on verbal behavior.

Applied behavior analysis is often used to bring an individual closer to societal norms (i.e., Risley, 1970). This is clearly Petruchio's aim in *The Taming of the Shrew*. The ethical and cultural issues involved in such attempts are important, and the present description of Petruchio's behavior is not intended to imply that the cultural norms within which he operated were desirable. Thus, Kate's refusal to submit to her male "elders" would be an admirable trait in modern society. Other aspects of her behavior, however, such as physical and verbal aggression, would be considered undesirable even in modern society. Thus, while much of Kate's behavior would be acceptable by modern standards, her behavior is altogether unacceptable by Elizabethan standards. As Shakespeare's text makes clear, the perfect Elizabethan lady was demure, learned in the arts, and, above all, subservient to her male elders.

Much of Act I is spent describing Kate's unusual behavior. The first examples come from descriptions given by other characters. In Act I, Kate speaks only 12 lines. However, in the same space she is described as "too rough" (I,i,55), "stark mad" (I,i,69), "a fiend of hell" (I,i,87), "shrewd and froward" (I,ii,88), and "intolerable curst" (I,ii,87). Clearly, such descriptions do not portray a proper Elizabethan lady.

Although much of Kate's behavior is described by others, her actions seem to justify her reputation. In a lengthy exchange with Petruchio (II,i,183-326), Kate's words are fiery and aggressive. Conversational retorts such as "asses are made to bear and so are you" (II,i,201) and "I'll see thee hanged first" (II,i,301) are two examples of undesirable verbal behavior. Kate also threatens violence. For example, she tells one of Bianca's suitors that she will "paint your face and use you like a fool" (I,i,65). To "paint one's face" is to bloody it (Harbage, 1969). Actual physical violence also occurs. For example, Kate first binds (II,i,1) and then strikes Bianca (II,i,22).

The unusual quality of Kate's behavior strongly contrasts with that of Bianca. While Kate is rude and aggressive, Bianca's responses are the epitome of Elizabethan ladyhood. For example, Bianca's responses to her male elders include meek and cloying statements such as "Sir, to your pleasure humbly I subscribe" (I,i,81-82).

In summary, the events in Acts I and II are relevant to behavior analysis in two ways. First, by enumerating the undesirable aspects of Kate's behavior, Shakespeare has described a "pre-intervention baseline" in which a set of target responses are described in their present, undesirable form. Second, by contrasting Kate's behavior with Bianca's, Shakespeare has described a "behavioral objective" that the target responses should approximate after the introduction of an appropriate intervention.

Establishing the Reinforcers

It is well known that behavior interventions based on reinforcement (e.g.,

token economies) require some control over the subject's environment (see Stolz, 1978, for discussion). Part of Petruchio's success with Kate comes from his ability to control the contingencies in her environment, including her sources of reinforcement. From the moment of their wedding in Act III, Petruchio manages Kate's surroundings. For example, he immediately removes Kate from her family and friends after their wedding (III,ii,180-255). This removes Kate from the environment that presumably shaped and maintained her "froward" behavior, and it places Kate in an environment where reinforcers delivered by Petruchio are the only ones available.

Much of Act IV describes events in which Petruchio establishes reinforcers, both through deprivation and more subtle motivational operations. The first, and most obvious reinforcer is food. In Act IV, Petruchio refuses to let Kate eat, giving the false excuse that the food is "burnt and dried away" (IV,i,141-165). Later (IV,iii,1-32), the value of food is enhanced when one of Petruchio's servants first teases Kate by showing her freshly roasted meat, and then withholds it from her. Petruchio (IV,iii,36-50) then offers food to Kate, only to take it away because Kate has failed to thank him. Although food is the most common reinforcer used, there are a number of others. Petruchio deprives Kate of sleep (IV,i,175-198) and clothing (IV,iii,61-166), and threatens to deprive her of attending a wedding party (IV,v,7-8).

In addition to obvious deprivation operations, Petruchio behaves in a bizarre manner during much of Act IV. For example, Petruchio accuses a tailor of producing a poor gown when the garment is clearly of high quality (IV,iii,86-165), refuses to believe the correct time of the day (IV,iii,184-186), insists that the sun is really the moon (IV,v,1-14), and acts toward a well known gentleman as if he were a woman (IV,v,27-47).

Several behavioral interpretations exist for these bizarre instances. First, they might be setting conditions that make the other reinforcers which Petruchio controls even more powerful. Thus, by making the environment bizarre, Petruchio

has altered the context of reinforcement, making food, sleep, and clothing even more potent controllers of behavior.

A second interpretation is that the bizarre environment is part of a negative reinforcement procedure. Each of the instances of bizarre behavior result in Kate's obvious discomfort, and establish an aversive situation from which escape would be reinforcing.

A third interpretation is that these bizarre events are a form of punishment. That is, Petruchio acts bizarrely as a response to Kate's "froward" behavior (i.e., driving out poison with poison; Hosley, 1969). It is unclear whether the bizarre environment is used as a punisher because Petruchio's bizarre behavior does not *directly* follow any of Kate's "misbehavior." Petruchio's actions, however, are strongly correlated with Kate's misbehavior, and a correlation between responses and environmental events may be sufficient to produce a behavioral change (Baum, 1973).

Arranging the Contingencies

Deprivation and aversive stimulation alone do not constitute a reinforcement procedure, but establish the conditions under which an event will serve as a reinforcer. A reinforcement procedure requires a contingency between response and reinforcer. Shakespeare makes clear that Petruchio has arranged Kate's world so that certain events are contingent on clearly specified behavior.

Petruchio's description of his own actions show that there are such contingencies. For example, Petruchio compares training Kate to training a falcon:

Thus I have politely begun my reign
And 'tis my hope to end successfully
My falcon now is sharp and passing empty
And till she stoop she must not full be gorged
(IV,i,175-180)

The falconry metaphor clearly refers to a contingency between Kate's behavior and food reinforcers. The falcon (Kate) is sharp and passing empty (has been deprived), and must stoop (emit the desired response) before it is gorged (allowed to eat). Interestingly, Petruchio's speech also suggests that he is making an assumption

common to many behavior analysts: Animal models are relevant to human behavior (Skinner, 1957).

Later, Petruchio explains to Kate what is expected of her. During the incident with the tailor, Kate complains that she has no proper gown. Petruchio responds with "When you are gentle you will have one too, and not till then" (IV,iii,71-72). Petruchio is telling Kate that she will obtain reinforcers (in this case fine clothing) only when her behavior changes.

Still later, Kate is told of the contingency between reinforcers and her behavior. When Petruchio argues that the sun is really the moon, Kate is told by one of Petruchio's friends to "Say as he says or we shall never go" (IV,v,11). In doing so, he is telling Kate that they will proceed to the wedding party only when Kate agrees with Petruchio that the sun is the moon. Here, the necessary response is well defined. Interestingly, Kate makes the correct response, prompting Petruchio's friend to remark, "The field is won" (IV,v,23).

Post-Intervention Assessment

In Act IV, Petruchio presents Kate with a number of "probe trials," through which he assesses her behavior, presumably in terms of the norm (target response). For example, in the instances involving the sun and the moon (IV,v,1-14) and the man seen as a woman (IV,v,27-47), Petruchio gives Kate the opportunity to agree with him. Here, Petruchio is testing Kate's behavior by presenting her with statements with which she would normally disagree. The correct response (agreeing with Petruchio) would only be likely to occur if the contingencies had been effective. Thus, Petruchio periodically tests Kate throughout Act IV.

The incident with the sun and moon marks the turning point in Kate's behavior. Following the advice of Petruchio's friend, Kate vows to agree with her husband:

And be it moon or sun or what you please
An if you please to call it a rush-candle
Henceforth I vow it shall be so for me
(IV,v,13-15)

Kate has acknowledged the contingen-

cies, and has agreed to behave as Petruchio specifies. Immediately afterward, Petruchio addresses a man as if he were a woman. Again, Kate agrees with Petruchio (IV,v,26–48).

By the end of the play, it is clear that Petruchio's methods have been successful. In a long speech in the final act (V,ii,141–184), Kate proclaims that "Thy husband is thy lord, thy life, thy keeper" and women are "bound to serve, love, and obey" their keepers. This behavior is in stark contrast to that shown in Acts I and II. Of additional interest is the fact that Petruchio responds to Kate's speech with the now famous line "Kiss me, Kate" (V,ii,185), an example of positive social reinforcement (affection) immediately following a desired response (Kate's statement of her "duty").

The change in Kate's verbal behavior is accompanied by a change in her non-verbal behavior. In the final scene (V,ii,65–71), Petruchio offers a wager that Kate will be the most obedient of three recently married women (including Bianca). Kate, alone among the three wives, comes at her husband's request.

CURRENT ISSUES

Although the present discussion has examined the relatively simple premise that Shakespeare's text is consistent with behavioral principles, the text also raises a number of subtle and complex issues of current interest in behavior analysis. For example, the text raises questions relevant to theoretical issues, cultural/ethical issues, and issues of public relations. Although an in-depth discussion is beyond the scope of the present paper, each of these is discussed briefly below.

Theoretical Issues

One current controversy in behavior analysis is the extent to which behavior is controlled by rules as opposed to contingencies (i.e., Brewer, 1974; Catania, Matthews, & Shimoff, 1982; Galizio, 1979; Skinner, 1974). To what extent might Kate's new repertoire have been generated by rules? Certainly, the explicit formulation of rules is followed by

changes in Kate's behavior—as in the case where Kate responds as specified when told to "Say as he says or we shall never go" (IV,v,11). Unfortunately, Shakespeare did not include the control manipulations necessary to distinguish rule-governed from contingency-governed behavior: Petruchio follows Kate's new behavior with immediate consequences, thereby confounding contingencies with rules. Thus, the text does not (and as a literary work, of course, could not) shed light on the theoretically important question of whether behavior is initially generated by contingencies or rules. The text does, however, highlight the practical importance of choosing contingencies that support behavior generated by rules.

Cultural and Ethical Issues

One common criticism of Skinner's (1953, 1971, 1974) call for a behavioral technology has been the issue of control (i.e., Rogers & Skinner, 1956). Many have objected to a behavioral technology because a highly developed technology puts too much power into the hands of those who control the resources required to use the technology. Just as a nuclear technology might put too much power into the hands of those who control the warheads, a behavioral technology might put too much power into the hands of those who control the reinforcers. Skinner has responded by pointing out that behavior is always controlled, and that escape responses (or countercontrol) are available when control becomes aversive or exploitative.

The Taming of the Shrew is, in fact, an example of the use—albeit unknowing—of a behavioral technology to less than desirable ends. Modern readers may be offended by the apparent acceptance of a sexual double standard that underlies the entire play. Petruchio's ceremonially derived access to reinforcers (Glenn, 1986) is what allows him extensive control over the contingencies with which Kate interacts. Shakespeare leaves the strong impression that Petruchio will be good to Kate as long as she behaves in accordance with Elizabethan norms. Implicit in the text is that Kate can have

everything most women of her time might want, but that she must not want anything other than that which most members of her sex were allowed by Elizabethan society. Kate's behavior may be seen as ineffective countercontrol. Her attempts at countercontrol, however, are highly desirable, indeed heroic, from the broader perspective of social issues.

Issues of Public Relations

In recent years, behaviorists have found it increasingly difficult to gain general acceptance in the psychological community. For example, mentalistic statements such as "a satisfactory account also requires a description of internal processes that mediate between input and output—processes involving, for example, perception, attention, and memory" (Schwartz, 1984, p. 44) are becoming commonplace, even in the literature on nonhuman behavior.

One reason for this "new mentalism" may be that mentalistic explanations come more naturally to the general public than do behavioral explanations (Dougan, 1987; Lee, 1986). For example, most of my students at least initially argue that their behavior is controlled, not by the environment, but by their thoughts, feelings, and emotions. Although they cannot logically defend these mentalistic descriptions, they appear to be more comfortable with mentalistic explanations than with scientific explanations.

In this context, I have found *The Taming of the Shrew* especially useful. Shakespeare's play describes changes in behavior as the result of environmental contingencies, with little reference to the character's thoughts, feelings, and emotions. My students generally find Shakespeare's description to be credible (more so, in fact, than the descriptions in *Walden Two*), and thus become more open to the behavior-analytic principles found in *Shrew*.

CONCLUSION: WAS THE BARD A BEHAVIORIST?

Was the Bard a Behaviorist? In the current sense of the word, probably not. In

the end, of course, Shakespeare's psychological viewpoint is of little importance to modern behaviorists. What is important is that behavioral processes are accurately described. In a verbal community where behaviorism is often under attack, the portrayal of behavioral processes by a distinguished and literate former member of that community is, to say the least, refreshing.

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