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OBSERVATIONAL LEARNING EFFECTIVENESS AS A FUNCTION OF MODEL CHARACTERISTICS: INVESTIGATING THE IMPORTANCE OF SOCIAL POWER

KERI R. BREWER AND DANIEL L. WANN

Observational learning is an important component of human learning. According to Bandura (1965), observational learning is characterized by four stages: attention, retention, motor reproduction, and motivation. The first stage, attention, is a crucial subprocess that can be influenced by model characteristics. Characteristics such as attractiveness, trustworthiness, similarity, and perceived competence have been shown to enhance a model's effectiveness. This study extended this research to social power. It was hypothesized that observational learning effectiveness would be greater in groups taught by a model with a base of social power than in a control group. A research question examined which base of social power (legitimate, expert, or referent) yielded the greatest effectiveness. Subjects watched a tape of a model performing a puzzle task. The model was described as having one of the three bases of social power. A fourth group was taught by a model introduced without the mention of a base of social power. The results revealed that subjects in the power groups scored significantly higher on the variables of time elapsed to complete the puzzle, number of pieces correctly placed, and whether the subject finished or not. Implications for the findings of this study such as the use of social power(s) in a teaching and managerial setting are discussed.

Human and animal learning involves many different techniques and processes (Bandura, 1963). One such process is learning by observation. Observational learning has been defined by Bryant and Fox (1995) as "observation and reproduction of a sequence of new behaviors to be learned by watching another person engage in that sequence of behaviors" (p. 495).

One of the leading researchers in the field of observational learning is Bandura. In his social learning theory, Bandura (1965) proposed four basic components of observational learning: attention, retention, motor reproduction, and motivation.

Keri R. Brewer and Daniel L. Wann, Department of Psychology, Murray State University, Murray, Kentucky.
This research project was conducted as a senior honors thesis, by Keri R. Brewer.
Please address correspondence and reprint requests to: Daniel L. Wann, Department of Psychology, Box 9, Murray State University, Murray, KY 42071-0009, USA, or to danwann@msumusik. mursuky.edu via the internet.

The first subprocess of attention refers to the fact that subjects must focus on the model in order to view the target behavior. For example, person P must watch what model O does if P wants to learn the target behavior. The second subprocess of retention concerns the subject's ability to create an internal representation of the target behavior. Such a representation is necessary if he or she is to reproduce the behavior in absence of the model. That is, P must remember what O did if P wants to reproduce the behavior. The third subprocess of motor reproduction includes the use of internal representations to perform the target behavior. This component refers to the ability of the subject to replicate behaviors; the subject cannot perform the behavior if he or she lacks the physical and/or mental abilities. For instance, P must be able to do what O did. The final subprocess of motivation suggests that the subject will translate learning into performance only if there is a favorable incentive for the subject. For example, P must feel that replicating O's behavior will have positive consequences.

The first subprocess of attention has been found to be a crucial factor in observational learning effectiveness because this is the point at which subjects focus on the model. Models who possess certain characteristics are more likely to hold subjects' attention and, as a consequence, are more likely to successfully reproduce the target behavior. Research indicates that subjects pay particular attention to models with such characteristics as attractiveness (Baron, 1970), trustworthiness (Zimmerman & Koussa, 1979), similarity (McCullagh, 1987), and perceived competence (Mischel & Grusec, 1966; Paradise, Conway, & Zweig, 1986).

A model characteristic that had not been studied in the context of observational learning was power. French and Raven (1959) defined power as the ability to influence, particularly in the context of a change in behavior. The phenomenon of power is established when P is influenced by O. This influence could enhance the effectiveness of a model by holding a subject's attention.

In their 1959 studies, French and Raven identified five different bases of social power able to influence behavior. The different bases of power are established from the perspective of P. Reward power occurs when P sees O as having the ability to dispense positive consequences as a result of P's performance of desired behavior. Conversely, coercive power is established when P perceives O to have the ability to punish P for undesired behavior. French and Raven note that it is often difficult to distinguish between coercive and reward power. Sometimes the withholding of a reward can be misinterpreted as a punishment and so the two bases of power are often used in conjunction with one another.

French and Raven (1959) identified three bases of social power that are independent of consequences. Legitimate power is established when P perceives O to be in a position of authority. French and Raven note that this base of power can be the most complex. One must understand the importance of roles, norms, and the sense of "oughtness" that play a part in establishing this base of power. Legiti-

mate power stems from the feeling that O has a right to influence P and that P is obligated to accept it. Expert power is established when P perceives O to be knowledgeable within a given area. This knowledge is evaluated by P against a certain standard as well as against P's own knowledge of the area. Referent power is established when P feels some identification and/or liking for O. French and Raven note that the this base of power becomes stronger as P feels more attracted to O (French & Raven, 1959).

The influence of O on P could enhance the effectiveness of a model during the attention stage of observational learning. The current study investigated the effectiveness of legitimate, referent, and expert power on subject attention in an observational learning context. It was hypothesized that observational learning effectiveness would be greater in groups taught by a model with a base of social power than in a control group. A research question examined which of the three bases of social power yielded the greatest effectiveness.

METHOD

Participants and design

Participants were 60 (16 male; 44 female) college student volunteers earning extra credit in their introductory psychology class in exchange for participation. Subjects ranged in age from 18 to 34 (M=18.89, SD=3.20). The subject pool consisted of freshmen (56.70%), sophomores (26.70%), juniors (10.00%), seniors (5.00%), and a graduate student (1.70%). The design was a 4 (Model's Base of Power: referent, legitimate, expert, or control) x 4 (Measure: effectiveness of the model, time elapsed to complete puzzle, number of pieces in the puzzle correctly placed, and whether the puzzle was finished or not) mixed factorial design. The first variable (model's base of power) was between-subjects and the second variable (measure) was within-subjects.

Procedure

Subjects were tested individually and randomly assigned to one of the four groups. After reading, signing, and returning an informed consent statement, the researcher introduced the model with a description of the model's social power. The verbal descriptions of each of the three bases of social power contained exactly thirty-four words. In the expert power group, the model was introduced in the manner as follows:

> "You are going to watch a short video of a model performing a puzzle task. This individual has an exceptionally high IQ for spatial tasks, that is, tasks that involve geometric shapes and objects."

In the legitimate power group, the model was introduced in the manner as follows:

> "You are going to watch a short video of a model performing a puzzle task. This individual is a tenured professor at Murray State University. He has 25 years teaching experience at Murray State."

In the referent power group, the model was introduced in the manner as follows:

> "You are going to watch a short video of a model performing a puzzle task. This individual is very warm and cautious. He is intelligent, skillful, and industrious. He is also determined and practical."

The characteristics listed in the description of the model with referent power are found in the Asch (1946) central trait theory which states people are more likely to have a favorable opinion about an individual possessing such qualities. The model was introduced to the control group in the manner as follows:

> "You are going to watch a short video of a model performing a puzzle task."

Subjects were then asked to watch a video of the model performing an observational learning task. The video was approximately two minutes in length. The task was operationally defined as the process of taking Euclid's puzzle in configuration 1 (see Figure 1) and changing it into configuration 2 (see Figure 2). After viewing the tape, subjects were given a questionnaire assessing their impression of the effectiveness of the model. Subjects were asked "How effective do you think the model was in teaching the puzzle task?" Responses to this Likert-scale item ranged from *not effective* (1) to *very effective* (8). Subjects were then asked to engage in the task. During performance of the task, subjects were given a representative example of Euclid's puzzle in configuration 2 as a guide (see Figure 3).

The researcher recorded whether the subjects finished the puzzle or not. If the puzzle was finished, the researcher recorded how long it took them to complete the puzzle (there was a ninety second time limit). The researcher then recorded how many pieces in the puzzle were correctly placed. Following the performance of the task, subjects were given a manipulation check questionnaire to assess the model's bases of social power. This inventory consisted of nine questions, three questions directed toward each of the bases of social power. Subjects rated the questions in Likert-scale format ranging from *this is very untrue* (1) to *this is*

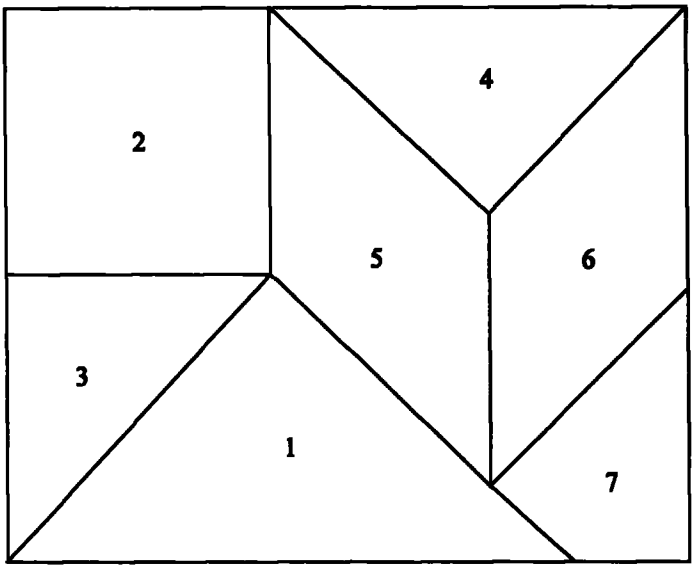

FIGURE 1. Euclid's puzzle in configuration 1. The description of the pieces is as follows:

1. Large triangle (10 cm^2 x 14 cm)
2. Square (7 cm^4)
3. Small triangle (10 cm X 7 cm^2)
4. Small triangle
5. Rhombus (7 cm^4)
6. Rhombus
7. Kite (2.8 cm^2 x 7 cm^2)

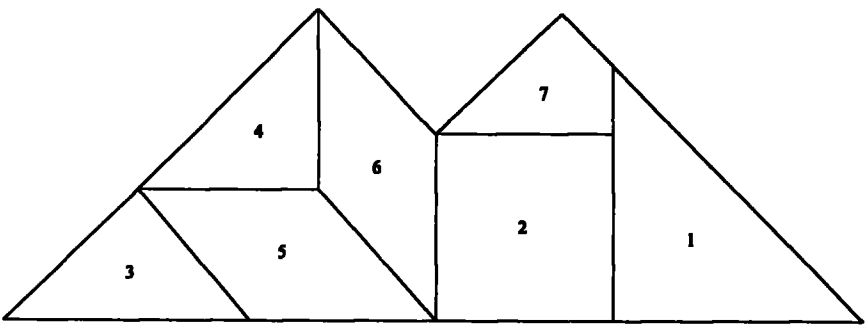

FIGURE 2. Euclid's puzzle in configuration 2.

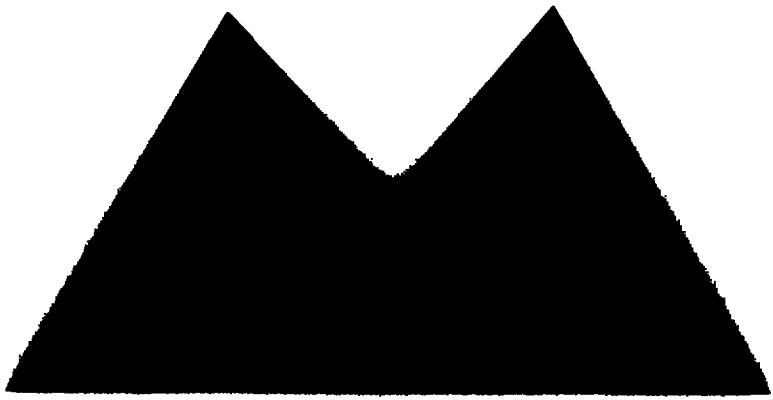

FIGURE 3. Representative example of Euclid's puzzle in configuration 2.

very true (8). When the procedure was complete, subjects were verbally debriefed as to the nature and hypotheses of the research.

RESULTS

Analysis of Three Continuous Dependent Variables

The initial analysis involved a one-way multivariate analysis of variance (MANOVA). The MANOVA consisted of the three continuous dependent variables (Measure: effectiveness of the model, time elapsed to complete puzzle, and number of pieces in the puzzle correctly placed) and one independent variable (Model's Base of Power: legitimate, expert, referent, or control). The means and standard deviations for each of the dependent measures appear in Table 1.

TABLE 1
Means, Standard Deviations, and Proportions for Measures of Three Power Groups and the Control Group

	Measure						
	Effect		Time		Pieces		Finished
Power Group	*M*	*SD*	*M*	*SD*	*M*	*SD*	%
Legitimate	6.40	1.41	64.00	27.97	5.47	1.89	60.00
Expert	5.93	1.67	55.00	27.51	5.67	1.63	67.00
Referent	6.33	1.29	62.80	24.47	5.60	2.13	60.00
Control	5.40	1.81	78.53	19.93	3.53	2.48	20.00

The MANOVA failed to reveal a significant main effect for model's base of power, $F(3,56)=1.96$, $p>.05$. However, a significant main effect was found for measure, $F(2,112)=313.94$, $p<.05$. This finding is a function of the fact that the

ranges of the three measures differed greatly (e.g., the effectiveness scale ranged from 1 to 8 and the pieces scale ranged from 1 to 7, whereas the time scale ranged from 0 to 90). The main effect was qualified by a significant Model's Base of Power by Measure interaction, $F(6,112)=2.42$, $p<.05$. This finding suggested the need for independent analyses of the three measures using an analysis of variance (ANOVA).

The most effective way of testing the hypothesis that observational learning effectiveness would be greater in groups taught by a model with a base of social power than in a control group was to compare the three power groups to the control group through a one-way ANOVA with planned contrasts (Rosenthal & Rosnow, 1985). The first contrast analysis examined the subjects' ratings of the model's effectiveness. This analysis failed to reveal a significant difference between the power groups ($M=6.13$) and the control group ($M=5.40$), $t(56)=-1.58$, $p>.05$, although the means were in the predicted direction. The second contrast analysis examined the time to complete the puzzle. This analysis indicated a significant difference between the power groups and the control group, $t(56)=2.39$, $p<.05$. As hypothesized, subjects in the power groups ($M=60.33$) completed the puzzle in a shorter amount of time than those in the control group ($M=78.53$). The third contrast analysis was computed on the number of pieces in the puzzle correctly placed. This test found a significant difference between the power groups and the control group, $t(56)=-3.34$, $p<.05$. As hypothesized, subjects in the power groups ($M=5.58$) placed more pieces correctly than those in the control group ($M=3.53$).

Newman-Keuls tests were used to test the research question concerning which of the three bases of social power would yield the greatest effectiveness. Analysis of the data failed to reveal any significant difference between any of the three power groups involving any of the continuous dependent variables.

Analysis of the dichotomous variable

In order to analyze the difference in scores of the dichotomous measure of whether the puzzle was finished or not, a test of proportions was performed (refer to Table 1 for percentages). This analysis revealed a significant difference between the power groups and the control group, $z=-2.81$, $p<.05$. Thus, the hypothesis that a higher percentage of subjects in the power groups ($M=62.40$) would finish the puzzle than in the control group ($M=20.00$) was supported. There were no significant differences between any of the power groups.

Analysis of the manipulation check

Scores on the manipulation check questionnaire were first examined using a factor analysis with varimax rotation. This analysis revealed that two of the items on the questionnaire were not reliable (one each on the legitimate and referent

subscales). Those two items were then omitted from the questionnaire. The seven remaining items were then reanalyzed using factor analysis (See Table 2 for factor loadings, Eigenvalues, and percentages of variance). This analysis revealed the expected three factor solution. Cronbach's reliability alphas were then computed to determine the reliability of the subscales. This analysis revealed that each subscale had suffficient reliability (legitimate alpha =.87, expert alpha =.67, and referent alpha =.63).

A MANOVA was performed on the manipulation check questionnaire to validate the model's base of social power in each of the three power groups and the lack of social power in the control group (see Table 3 for means and standard deviations). This analysis failed to reveal a significant difference between the power groups and the control group. Furthermore, this analysis showed that subjects in the legitimate, expert, and referent power groups did not score the model on the appropriate subscale as intended.

TABLE 2
FACTOR ANALYSIS FOR THE MANIPULATION CHECK QUESTIONNAIRE

Content of Item	Subscale Legitimate	Expert	Referent
I followed the model's instructions about the puzzle because he has a great deal of knowledge about the subject.	.88		
I followed the model's instructions about the puzzle because I like him.			.89
I followed the model's instructions about the puzzle because of his role and position in the university.	.81		
I followed the model's instructions about the puzzle because of his authority.	.75		
I followed the model's instructions about the puzzle because I consider him an expert in this area.		.81	
I followed the model's instructions about the puzzle because I find myself similar to him.			.73
I followed the model's instructions about the puzzle because he knows more about the topic than most people.	.72		
Eigenvalue	3.10	1.32	1.03
% variance accounted for	44.30	18.80	14.80

TABLE 3
MEANS AND STANDARD DEVIATIONS FOR THE MANIPULATION CHECK QUESTIONNAIRE

	Subscale					
	Legitimate		Expert		Referent	
Power Group	*M*	*SD*	*M*	*SD*	*M*	*SD*
Legitimate	2.43	1.37	3.78	1.83	1.60	.87
Expert	2.23	1.25	4.44	2.10	1.70	.88
Referent	2.20	1.25	3.73	2.11	1.37	.72
Control	2.63	1.83	4.02	2.27	1.50	1.00

DISCUSSION

The results of the current investigation revealed that social power enhances the overall effectiveness of a model in an observational learning task. Subjects who watched a model with a base of social power were more likely to finish the puzzle. Subjects in the power groups finished the puzzle in less time than those in the control group. Subjects in the power groups also placed significantly more pieces in the puzzle correctly than in the control group. This data suggests that the presence of social power in the model facilitated the attention subprocess of observational learning, thus enabling the subject to perform better on the task.

Subjects in the power groups did not, however, rate the model's effectiveness any higher than did the control group, although the means were in the predicted direction. The effectiveness questionnaire was administered to the subjects before they engaged in the puzzle task. This time frame was chosen to prevent a confounding effect between the subjects' impressions of the model's effectiveness and whether they finished the puzzle or not. This time frame may have been too early to assess the subjects' true impressions of effectiveness. Perhaps the subjects in the power group were not aware of just how effective the model had been in teaching the task until they had already performed the puzzle. Further research in this area may wish to administer such a scale questionnaire after the observational learning task has been performed.

There were no significant differences in any of the dependent variables between the power groups. This suggests that social power enhances the effectiveness of a model, regardless of the type of power in question. This has positive implications for many teaching settings. Although it is common practice to attempt the attainment of multiple bases of power, this is often not possible. Perhaps such attainment in unnecessary. According to the current study, the attainment of only one base of social power is necessary to elicit desired behavior.

Reward and coercive power were not investigated in this research study. Reward power mandates that the model have the capability to provide some favorable incentive. Coercive power mandates that the model have the capability to take away some valued item. An ethical manipulation of such bases of power could not be achieved. Thus, the effects of these two bases of social power in an observational learning setting are yet unknown. Further research may wish to study the effects of reward and coercive power in a similar setting to assess the differences in their respective effectiveness.

The manipulation check questionnaire revealed that subjects in the legitimate, expert, and referent power groups did not scale the model on the appropriate subscale as intended. The previous data suggests that social power was indeed an effective force on the observational learning task. In lieu of these facts, it seems that the subjects were influenced by the model's social power without their real-

izing it. The social power was subtle, but there was enough power to make a significant difference. This could have serious implications for any management position. According to the findings in this study, power does not have to be overtly obvious for it to have a desired effect on behavior.

In conclusion, social power can be used as an effective tool for influencing behavior. This power can be suggested in a subtle way and still produce a significant difference in behavior. There is no superiority in effectiveness between legitimate, expert, and referent power. These three bases of power are equally likely to elicit desired behavior. This is relevant information for any setting in which power is used to influence behavior, such as teaching and management.

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