The effect of laughter on evaluation of a slapstick movie[1]

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If we laugh at a joke we are likely to think it funny, and funnier situations are expected to cause more laughter and more positive judgments (Calvert, 1949, Zigler, Levine, & Gould, 1966) Common sense and psychological theories (Rosenberg, 1960) suggest that a person's attitudes (evaluations) and emotional reactions are likely to be consistent But does this consistency between laughter and evaluation reflect a correlation or a more dynamic, causal relationship? If there is a "dynamic" relationship between laughter and evaluation, we should be able to alter a person's evaluations of a joke or a movie by changing his laughter The evaluative change could be due to dissonance produced by a comparison of belief and behavior (Festinger, 1957) or to persuasion due to exposure to one's own actions (Bem, 1967) In either case the person's laughter leads him to rate the stimulus as funnier

The evidence from prior research is ambiguous about whether laughter does influence judgment For example, Martin (1905) asked subjects to encourage or suppress laughter while they were viewing cartoons Suppression of laughter decreased the evaluated funniness of the cartoons, while expression of laughter increased it She concluded that "laughter and a feeling of funniness go hand in hand" (p 104). On the other hand, Young and Frye (1966) found that subjects who read jokes in group conditions (in comparison to individual conditions) laughed more but did not rate the jokes as funnier. These authors "make a distinction between the overt laugh as a response to humor and

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the covert rating of the same joke The overt response seems to be much more sensitive to the nature of the social situation The two responses do not bear upon one another" (p 752).

The inconsistent findings suggested that it would be desirable to explore the various situational variables and individual difference factors that might be responsible for consistency and/or inconsistency between evaluative responses and laughter The evidence from several recent studies (Schachter & Singer, 1962, Schachter & Wheeler, 1962) suggested that the overt responses (mirth, laughter, etc) involved in emotion are readily influenced by situational variables such as social stimulation and drugs, while the attitudinal reactions are more closely related to the individual's past experience with the stimulus object For example, Schachter and Wheeler (1962) compared the expressive and evaluative reactions of subjects injected with epinephrine and subjects given chlorpromazine prior to viewing a slapstick movie They found significantly more laughter among the epinephrine injected subjects Schachter (1964) has interpreted this as evidence of a change in the evaluation of the stimulus Yet the original data clearly show that subjects' attitudes were unaffected by their laughter and suggest that the two responses are independent of one another The subjects appear to have "known" the stimulus and to have decided that they were laughing too much at that "kind of nonsense" Experience or complexity of cognitive development seemed to be responsible for the independence of evaluation from immediate emotional feedback.

Experiment I

In the Schachter and Wheeler study (1962) differences in experience with slapstick movies were treated as individual differences stemming from incidental or random exposure to such materials In the present experiment an effort was made to treat the individual difference factor more systematically In particular, it was assumed that age would provide an index of cognitive complexity or experience Older children should have experienced a wider range of humorous material and should generate more stable cognitive evaluations than younger children Older children also have more experience with laughter and have had more

opportunity to observe discrepancies between their laughing behavior and their final evaluations of specific stimulus situations Though no precise guide was available respecting ages to sample, it seemed reasonable (within practical considerations of availability of youngsters, ability to understand rating procedures, etc) to use the youngest children possible In the present experiment we compared laughter and evaluation in two groups first- and second-grade children with fourth- and fifth-grade children. Thus two age levels were exposed to a slapstick motion picture The film provided the occasion for examining the relationship between expressive behaviors and evaluation An instructional manipulation was used to change expressive behavior, the children were told either to inhibit or to express their laughter Following the reasoning outlined above, it was anticipated that attitudes of younger children but not those of older children would be influenced by expressive activity (more laughter, more favorable attitudes).

Subjects and Design

Twenty-four groups of three children ($N=72$) were exposed to humorous motion pictures Eight conditions were generated by the combination of instructions (express laughter–inhibit laughter), age (first and second grade versus fourth and fifth), and sex. To facilitate laughing Ss were run in groups of three, and these groups were assigned to each of the eight conditions The eight conditions were run in random order, and an entire set was completed before beginning again. The Ss came from two schools A group of 72 Ss, racially and socioeconomically heterogeneous, was drawn from the Roger Sherman School and the Winchester School

Procedure

E accompanied each group of Ss (boys or girls) to the experimental room. A small table with two microphones on it was placed directly in front of the motion picture projector The children were seated at this table, introduced to an adult (the rater) who was seated at a table to their right, and shown the first film

Baseline measures The first movie was a 3-minute section of Abbott and Costello's *No Indians Please* The second was a 2 25-minute excerpt of W C Fields's *Hurry, Hurry* Laughter scores were obtained during the films, and the Ss were trained in completing postfilm

questionnaires. Three questions were answered after each film For each question *E* explained to the *Ss* that they should circle the one number (a choice) which came closest to their feelings about the film Even though the youngest could read, *E* read aloud each question and its five possible responses The *E* delayed proceeding until each child completed his choice Because the first group of younger children tried to confer when answering the items, this and all subsequent younger groups were seated at individual tables There was no need to separate the older children

Manipulation of expressive behavior Instruction to facilitate or inhibit expressive behavior was introduced prior to the third film, a 6 25-minute segment of W. C Fields's *Hurry, Hurry* The facilitation instructions were "Before we show you this longer movie it is very important that you get very happy because we want you to laugh as much as you can We are recording your laughing for other children who will watch this movie Let's smile Can you laugh or giggle? Great Laugh as much as you can now"

The inhibition instructions were "During this film I have to do some work that involves listening closely to what people in the movie are saying This means that you mustn't laugh out loud or you'll bother me But you can enjoy the film to yourself"

Dependent Variables

Behavior ratings Mirth responses were rated on a four-point scale adapted from Redlich, Levine, and Sohler (1951) and Zigler et al (1966) The categories were (1) no response (blank face, etc), (2) inhibited to half or slight smile, (3) full smile, (4) laugh (responses rater could hear). Zigler reports high reliability for this scale ($r = .94$),[2] and our rater found the response categories easily discernible Using a stop watch, the rater scanned the *Ss* for 15 seconds and checked each *S*'s maximum response for the interval This was done 12 times during the first film, 9 times during the second, and 25 times during the third

Evaluations The three following items measured evaluation for the first two films (1) Was this a good movie? (2) Did you like this movie? (3) How funny was this movie to you? The same three items plus five more (4–8) were used after the third or experimental film (4) Would you like to see this movie again? (5) Was this better than other funny movies you have seen? (6) Was this better

2 This reliability represents agreement between 2 judges on total mirth scores for each of 32 subjects

than the first movie you saw? (7) Was this better than the second movie you saw? (8) How much did you enjoy watching this movie? A five-point scale accompanied each question.

Results and Discussion

Since a child's laughter can affect all members of his group, each trial was given a single mirth score ($N=24$) Evaluations, on the other hand, were composed in private, and the analysis was conducted on individual scores ($N=72$) Examination of the total evaluation score (a sum of eight questions about the film) does not support the hypothesis that increasing laughter would make younger children more favorable to the film Thus we must reject the hypothesis of congruity or consonance between attitude and laughter for younger children and incongruity or independence for older children (see Table 1) The analysis of the attitude index reveals instead a main effect for grade ($F_{1,64}=5\,77, p < 05$) and an interaction of the manipulation with

Table 1 Evaluation (mean for eight items) of experimental film in Experiment I

		Inhibition	Facilitation
Girls	Younger (1st and 2nd grade)	4 0	4 2
	Older (4th and 5th grade)	3 2	4 1
Boys	Younger (1st and 2nd grade)	4 7	4 2
	Older (4th and 5th grade)	4 2	3 9

the sex of the subjects ($F_{1,64}=6\,54, p < 05$). The grade effect shows that younger children gave significantly higher (more extreme) ratings than did older children The manipulation by sex interaction reflects the fact that boys gave more favorable ratings to the film in the condition where laughter was inhibited and gave lower ratings to the film in the condition where laughter was facilitated Girls, on the other hand, gave the film a higher rating in the facilitation condition than in the inhibition condition Boys and girls gave the film equally favorable ratings in the facilitation condition, while in the inhibition condition the boys gave the film more favorable ratings than did the girls

The scoring of mirth and laughter was examined to see if it

Table 2 Laughing and smiling (mirth) to experimental film (*Hurry, Hurry*) in Experiment I

		Inhibition	Facilitation
Girls	Younger (1st and 2nd grade)	1 4	2 1
	Older (4th and 5th grade)	1 4	3 0
Boys	Younger (1st and 2nd grade)	2 1	3 0
	Older (4th and 5th grade)	1 9	3 4

suggested any reasons for the failure of the original hypothesis and for the appearance of the unexpected sex by treatment interaction. The results (Table 2) showed a large and highly significant manipulation effect, mirth was higher in the facilitation condition than the inhibition condition ($F_{1,16}=40\,60$, $p < 01$) [3] There was also a tendency for older children to laugh more than younger children in the facilitation condition ($F_{1,16}=4\,64$, $p < 05$). Neither these data, nor the observations of the subjects, nor the informally conducted interviews suggest any special reason for the failure of the age hypothesis

The mirth data do provide clues respecting the process involved in the sex by instructions interactions All of these indicators suggest that boys more readily dissociate their expressive behavior from their attitudinal evaluations First, boys laughed more than girls ($F_{1,16}=12\,97$, $p < 01$), a sign that their laughter may be more easily turned on and off Second, there were indications that laughter and evaluation were dissociated by the facilitation instructions, the correlations between laughter and evaluation are positive in the inhibition condition (33 to 87) and negative in the facilitation condition ($-$ 17 to $-$ 74). Moreover, the highest positive correlation is for girls, while the highest negative correlation is for boys. Laughter and evaluation are more consistent for girls. Third, an inspection of the laughter scores over time showed that with laughter instructions boys' mirth responses were very high at the onset of the film Boys laughed before

3 Attitudes (summing across the three items) for the first two films, i e , prior to the manipulation of laughter, were more positive for younger than for older children ($F_{1\,64}=5\,77$, $p < 05$) But this held only for two of the three questions (*a*) Was this a good movie? ($F_{1,64}=5\,69$, $p < 05$) and (*b*) Did you like this movie? ($F_{1\,64}=8\,10$, $p < 05$)

the accumulation of "funny" instances, a pattern that is different from that for girls (a gradual rise in mirth in laughter instructions) and from that for boys and girls in inhibition instructions This intense onset of laughter for boys seems deliberate or internally generated rather than produced by the movie Girls, on the other hand, laugh less than boys and appear less deliberate and self-generating in their production of laughter. Thus, girls could more easily view their mirth as a consequence of the film In sum, mirth and attitude seem independent for boys and congruent or dependent for girls.

Of course, there is no certainty that the subjects were responding to their own laughter They could have been responding directly to the experimental instructions If so we might expect the girls to be docile to the demands of the experiment and both to laugh and to reevaluate the films. Boys, on the other hand, are publicly conforming (laugh more) and privately resistant (say film is less funny). It is also possible that the effects are partially dependent upon running the subjects in groups. Groups of boys may be more boisterous, and the outbursts of laughter may reflect mutual incitement rather than an individually based response to the laughter instructions

Experiment II

A second study was run to clarify the questions raised above and to check on the reliability of the sex by treatment finding. Rather than directing subjects to laugh, laughter was stimulated by means of canned laughter recorded on the film soundtrack The canned laughter was inserted immediately after funny incidents This was done to stimulate laughter during amusing film contents so that subjects could regard the laughter as a reasonable product of the stimulus. This manipulation should have weaker demand characteristics (Orne, 1962) than that used in Experiment I and should decrease if not eliminate the possibility that the sex effect is due to differences in compliance to the experimenter's command A second change was to run the subjects alone to eliminate the possibility that the group setting caused a dissociation of laughter and attitudes in boys. Both modifications increase the probability that the sexes are respond-

ing differently to expressive behavior rather than to experimental instructions or to irrelevant contextual features

The final major change in procedure was to run the experiment in two separate sessions The first session was devoted to the evaluation of the subjects' spontaneous laugh level, the second to the experiment. By measuring laugh level we could determine if the differences depend upon sex per se or to a sex-associated factor such as intensity of laughter. Thus maleness may be associated with more experience with laughter and a tendency to attribute the response to oneself rather than to a film

Finally, several minor procedural changes were introduced. Older subjects were used because considerable inhibition of laughter was observed when young subjects were run singly. The films were also switched, i e , *Hurry, Hurry* served as the pretest film, and *The Great Chase* as the experimental film. This seemed to have three advantages (*a*) the experimental effect, if replicated, would be observed on a film other than *Hurry, Hurry*, (*b*) *Hurry, Hurry* seemed a better pretest, as it evoked more spontaneous laughter, and (*c*) it seemed that mirth induced by canned laughter (which a pretest showed to be weak) would be more visible if the experimental film provoked relatively little spontaneous laughter. Thus we tried to insure the success of the mirth manipulation

Method

Subjects and design Forty-nine high school sophomores participated in two sessions held two to three weeks apart The Ss were run singly in both sessions At the second experimental session the Ss, divided by sex and initial mirth scores, were assigned randomly to control and canned laughter conditions with twice as many Ss assigned to the control condition [4] The total numbers were 33 Ss in control condition (8 males and 8 females with low mirth scores and 8 females

4 An additional 73 subjects were run in three conditions that were intended to compare same and opposite sexed pairs to the alone condition These groups would test hypotheses relevant to social facilitation of laughter The results for the pairs (in mirth and evaluation) were not different from those in the alone controls These groups are irrelevant to the main hypothesis and are not discussed further Their presence, however, accounts for the relatively large control groups (control subjects were to be randomly paired for this separate analysis)

and 9 males with high mirth scores) and 16 Ss in the canned laughter condition (4 females and 3 males with low mirth scores and 5 females and 4 males with high mirth scores)

Stimuli Recordings of laughter were made at a party, and 14 of the best sequences were inserted at 36 places on the movie soundtrack The soundtrack without the laughter was used for the control condition *Hurry, Hurry* served as the baseline film, and *The Great Chase* was used for the experimental movie

Measures The same mirth-rating scale was used The questionnaire consisted of eight items, three on evaluations of the film, two on judgments of peer evaluations, and three on perception of own behavior during film The items are presented in the results section

Results and Discussion

Mirth and evaluation Canned laughter produced a weak but noticeable increase in laughter and smiling (see Table 3, $F_{1,41} =$ 3 60, $p < .07$) The difference was smaller and less reliable than that produced by the direct instructions used in Experiment I.

Table 3 Laughing and smiling (mirth) during experimental film in Experiment II

	Pretest mirth	Experimental group	
		Control	Canned laughter
Girls	High	41 62 (8)	46 60 (5)
	Low	23 88 (8)	26 50 (4)
Boys	High	38 78 (9)	41 00 (4)
	Low	28 62 (8)	42 67 (3)

Despite the weakness of the mirth manipulation, several clear interactions appeared for the evaluation items. The main question concerns whether boys (or subjects prone to laughter) devalue the film when exposed to canned laughter while girls (or subjects who show little spontaneous laughter) increase their evaluation of the film The data analyses produced significant interactions of canned laughter with initial laugh level for two out of

Table 4 Mean evaluation of experimental film in Experiment II

Item	Pretest mirth level	Boys		Girls	
		Control	Canned laughter	Control	Canned laughter
A Was the movie funny?	High	3 56	2 25	3 62	3 40
	Low	2 88	3 67	2 12	3 50
B Was this a good movie?	High	3 44	2 25	3 38	3 60
	Low	3 38	4 33	2 12	3 50
C Did you like the movie?	High	3 56	2 75	3 50	4 00
	Low	3 25	4 33	2 12	3 25
D Did you smile during the movie?	High	3 78	3 00	4 12	4 00
	Low	3 00	4 33	2 12	3 50

three attitude items—Table 4 (*a*) Was the movie funny? ($F_{1,41}=9\,85$, $p<.01$), (*b*) Was this a good movie? ($F_{1,41}=4\,87$, $p<.05$), (*c*) Did you like the movie? ($F=2\,48$, n.s.) In every case those subjects who smiled and laughed a great deal on the pretest became less favorable to the film when they were exposed to canned laughter On the other hand, subjects who showed little smiling and laughing on the pretest became more favorable to the film when they were exposed to canned laughter These different evaluative changes occurred despite the fact that both groups of subjects (high and low mirth on the pretest) laughed more in the experimental canned laughter condition than in the control conditions [5]

The results given above are similar to the sex by manipulation interaction in Experiment I, there boys (who laughed more than girls) devalued the film when given instructions to express mirth, while girls increased their evaluation under the same instructions Although the present interactions do not include the sex factor, an examination of the data tables shows that among the high laughers only the boys judged the film as less funny when exposed to canned laughter The highly expressive girls show increased evaluation with canned laughter, though the increase

5 At a methodological level, it is important to note that the increases and decreases in evaluation depend upon the presence of canned laughter If the finding was a simple main effect, i e , a difference between high- and low-mirth subjects, one could easily argue that the results reflected the joint unreliability of the laughter and evaluation scores—each regressing on repeated measurement

is smaller than that shown by the less expressive girls Thus, a high mirth level and "maleness" increase the likelihood that increased laughter will be associated with decreased evaluation The similarity of the results for Experiments I and II seems reasonably satisfactory given the fact that the populations were different (high school rather than grade school students), the experimental film was changed, the manipulation was more indirect, and the subjects were run singly.

Alternative interpretations The results seem to rule out a simple Jamesian (James, 1884) or balance notion, i e , that there is a direct pressure toward congruence among expressive behavior and attitudes Sex and individual differences in strength of affect expression reverse the symmetry effect In particular the flexibility and the high control of their laughter by highly expressive boys appears to be related to their ability to discount it in making evaluations.[6] But it is not clear whether the results reflect (*a*) differential attention to or use of one's own expressive behavior or (*b*) differential responsiveness of the expressive and evaluative responses to external stimulus pressure Thus, for highly expressive boys canned laughter could directly increase laughter and decrease evaluation, the more public expressive acts respond positively to stimulus pressure, and the more private evaluative acts respond counter to stimulus pressure We may be observing a reactance effect that is stronger in males and active laughers (Brehm, 1966). Similarly, for low-mirth subjects the

6 The analyses of the mirth scores showed a significant main effect for premeasure mirth levels ($F_{1,14}=13\,58$, $p < 001$), high scores on the pretest were still high on the post-test There was also a variety of interactions between sex and initial mirth level These appeared following the experimental film for mirth scores ($F_{1,41}=5\,45$, $p < 05$), the three attitude items (F ratios of 3 25, 5 05, and 4 54, items in order listed in Table 4) and two of the three estimates of own behavior ($F_{smile}=5\,14$, $F_{fun}=13\,07$) All of these interactions appear to reflect greater variability in the behavior of boys than in the behavior of girls Thus initially high-mirth boys are less likely to be high (in mirth, attitudes, etc) upon retesting, and initially low-scoring boys are less likely to stay low The range of scores is similar for boys and girls, which means that these effects indicate a greater variability for boys rather than a more constricted response on retesting An examination of the means for these items also suggests that the effects are not simply due to static variables of sex and mirth level The "regression" of scores for boys is clearly stronger in the canned laughter condition But the two-way interactions are significant only for one of the six questions ($F_{\text{self reported mirth}}=5\,01$)

increased evaluation could reflect positive responses to the stimulus by both expressive and evaluative acts. Thus cognitive reactions need not be dependent upon feedback from expressive behavior.

There may be reasons, however, for preferring an interpretation based on differential response to one's own expressive activity. First, the effect appeared with two quite different manipulations, the canned laughter being far less direct and clearly less demanding than the instructions used in Experiment I At the least, this replication tends to rule out demand characteristics (Orne, 1962) Second, there are suggestions that high-mirth subjects actively discounted their own laughter Three items asked subjects to report on their behavior during the movie· (*a*) Did you smile during the movie? (*b*) Did you laugh during the movie? (*c*) Was it fun to be here? For the smile item there was an interaction of canned laughter and initial mirth score ($F=7$ 19, $p <$ 025, Table 4), high laughers report themselves as smiling *less* with canned laughter Thus high-mirth subjects reported less smiling when exposed to canned laughter, although their mirth scores were actually higher

This finding does raise a number of difficult questions If subjects responded to their laughter by devaluation of the film, why do they report reduced smiling? The question is whether subjects can, or will, make use of a cue and then deny its existence. Of course there is a possibility that the subjects actually smiled less, and that canned laughter diminished a low-level of mirth activity that was not readily captured by our scoring system Canned laughter may therefore exaggerate strong responses, or focus attention on strong responses, at the expense of weak responses. The consequence may be "artificiality" of expressive activity, i e., a shift to many strong responses with insufficient weak responses. The artificial nature of the pattern may result in devaluation

This interpretation may not differ markedly from that already suggested, that strong laughers, and boys in particular, who easily modulate or control their expressive actions compensate when making evaluations The "artificiality" of the response pattern may be a cue for compensation It can also be pointed

out that the results are analogous, in some respects, to the reactions of internally and externally controlled subjects to conditioning situations Internally controlled subjects seem unlikely to condition unless the experimenter makes explicit that they are supposed to condition (Rotter, 1966) When the instructions to condition are subtle the subjects resist influence It is very likely that changing one's scale ratings after instructions to laugh, or after canned laughter, represents conforming to a "subtle" rather than a direct influence attempt Moreover, males are generally assumed to be higher in internal control (see Aronfreed, 1961)

It should be pointed out that the issue of attentiveness to one's own expressive and internal reactions is a key problem in many studies of emotion For example, Rosenberg (1960) changed attitudes by hypnotizing his subjects and instructing them to feel a specific way every time they thought of a particlular issue But Rosenberg's hypnotic instructions attributed or tied the feeling to the issue object, and they could have served as a direct instruction to change attitudes toward the object The questions can also be raised in studies of self-observation in response to painful stimuli (Bandler, Medaras, & Bem, 1968) and in studies investigating the interaction of epinephrine injections and instructions upon verbal and instrumental "emotional" acts (Schachter & Singer, 1962) In these investigations it is assumed that subjects extract information from their internal, expressive, and/or instrumental acts In the Bandler et al study, making an escape response is said to inform the subject that a stimulus is painful Yet the study does not show that the subject judges the stimulus as painful *because* he makes an escape reaction, nor does it show that subjects (uninstructed as to the "meaning" of the response) would ordinarily draw such conclusions Similarly, Schachter and Singer (1962) provide no evidence that subjects are more easily made angry or happy because they cannot interpret their autonomic activity Subjects injected with epinephrine and uninformed of its consequences may be unaware of their autonomic activity rather than trying to explain it Subjects given accurate information may have been the ones who actually attended to their autonomic activity and therefore remained uninfluenced

Whether subjects are responding to the environment or their

own expressive behavior, it would be interesting to know why subjects show different patterns of evaluative and expressive responses to stimulation The specification of various patterns of organization would represent an advance over assumptions of intrinsic forces for symmetry

Summary

Two experiments were conducted to determine if changes in expressive behavior (laughter) would influence the evaluation of a slapstick movie In the first study young children of two different age groups (first and second grade versus fourth and fifth grade) were exposed to a comedy under either of two instructional sets. to laugh (so their laughter would be recorded) and not to laugh (to avoid obscuring the experimenter's hearing of the soundtrack) The subjects were run in groups of three, and equal numbers of boys and girls participated In the second experiment junior high school children were exposed individually to a slapstick film In one condition canned laughter was used on the film soundtrack and in the other it was not Subjects were tested twice (two weeks apart), with the initial testing used to divide them into high and low laughers The expectation in the first experiment was that younger children would rate the film as funnier when they laughed and that older children would not The results disconfirmed this expectation. Instead, when boys were encouraged to laugh they evaluated the film as less funny When girls were encouraged to laugh they evaluated the film as more funny In the second study, high laughers, especially boys, evaluated the film as less funny when it was accompanied by canned laughter, while low laughers (both boys and girls) thought the film funnier with canned laughter than without canned laughter A number of observations plus internal analyses suggest that people with high control over the onset and termination of their own expressive behavior (high laughers and/or boys) tend to discount their laughter when making cognitive evaluations

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