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The Effects of Verbal Reinforcement of Intrinsic Motivation for Sex-Linked Tasks[1]

Peter D. Blanck[2]
Harvard University

Harry T. Reis[2] **and Linda Jackson**
University of Rochester

Recent studies have demonstrated that positive verbal feedback enhances males' intrinsic motivation for a task, while decreasing that of females. This result has been attributed to differential socialization forces which make the controlling aspects of rewards more salient for females as opposed to males, for whom the informational aspects are prepotent. A weakness in this conclusion stems from the use of a masculine sex-linked task in prior experiments, producing a result which may be due to gender congruence/incongruence rather than to socialization differences. Two laboratory experiments were performed to examine the effects of verbal praise on intrinsic motivation, controlling for sex-typing of the experimental activity. Experiment 1 found that verbal praise increased females' and males' intrinsic motivation on both a feminine and masculine task, and intrinsic motivation was higher for sex-appropriate than sex-inappropriate tasks. The sexes did not show a differential pattern of response to praise. In Experiment 2, verbal praise also enhanced sex-role traditional females' intrinsic motivation on the same activity used in prior research. These results suggest that socialization content has changed sufficiently to make concerns about competence and self-determination equally salient for females and males.

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[2]Correspondence should be sent to Peter D. Blanck, Quillen 8B, Stanford, California 94305, or Harry T. Reis, Department of Psychology, University of Rochester, Rochester, New York 14627.

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People often pursue activities in the absence of external rewards. Many times, the simple satisfaction of challenging and conquering a problem or task is reward enough. Intrinsically motivated activities are those for which there is no apparent reward except the activity itself (Deci, 1975). Many studies have indicated that people's intrinsic interest in a given activity can be affected by extrinsic rewards such as money or praise. In a series of studies, Deci (1972, 1975) demonstrated that verbal praise enhanced males' subsequent interest for a task, while decreasing that of females. To account for this result, Deci proposed that positive verbal reinforcement strengthens males' sense of competence and self-determination, which in turn enhances intrinsic motivation. For females, the controlling aspect of verbal reinforcement is more salient, thereby decreasing intrinsic interest in the activity. According to Deci (1972, 1975), this difference is due to socialization processes that encourage females to be more dependent on and sensitive to social reinforcement (such as that coming from an experimenter of either sex). Thus, emphasis on the controlling aspect of praise initiates a change in locus of causality from internal to external, decreasing females' intrinsic motivation, even though the praise connotes a skillfull performance. Males, on the other hand, are more heavily socialized toward competence and self-determination, thereby making the informational value of praise more salient, enhancing their feelings of competence and self-determination, and hence intrinsic interest.

This interpretation has considerable importance for understanding how the sexes may differ in their response to success and social reinforcement. There is, however, a viable alternative. Deci's research employed the SOMA puzzle as the experimental activity. SOMA is a visual-spatial mechanical puzzle consisting of seven blocks that may be arranged into numerous geometric configurations, the subject's task being to reproduce sample patterns of varying difficulty. As Maccoby and Jacklin (1974) concluded, males perform better than females on tasks involving visual-spatial relations, these differences progressing to approximately .40 of a standard deviation during late adolescence. If SOMA is sex linked, it may have differential meaning for male and female subjects, since males are likely to have more experience, interest, skill, and ego involvement with it. Therefore, Deci's sex difference may be due less to a socialized difference in the nature of females and males than to the gender congruence of the task. As we will argue, individuals are generally more concerned about feelings of competence and self-determination on sex-appropriate tasks.

The intent of this research is to examine these alternative explanations. Broadly, we aim to explore sex differences in how verbal reinforcement affects intrinsic motivation on sex-linked tasks. We will first review existing empirical evidence. Numerous recent studies demonstrate sex differences in

response to negative verbal feedback (e.g., Dweck & Bush, 1976). However, since the present research deals with positive feedback, they will not be discussed.

Sex Differences in Response to Praise?

Deci (1972; Deci, Cascio, & Krusell, 1975) first found that praise increased the intrinsic motivation of males and decreased that of females. This was true regardless of the experimenter's gender. But the 1972 data are not without ambiguity; in that study, praise raised significantly the time played in the free-choice period from 146 to 269 seconds for males, while females' free time play remained essentially the same—263 to 255 seconds. Thus, the results seem due primarily to an unusually small time played by control group males, rather than to a decrease by females. In contrast, Deci et al. (1975) found clear increases among males and decreases among females.

Subsequent studies have reported mixed results. Carone (Note 1) found that praise decreased in intrinsic motivation for females using SOMA. Related results come from Alegre and Murray (1974), although they used a substantially different paradigm. The latter authors found that females habituated more readily than males when the rewards consisted of verbal praise. Hence, Deci's contention that females are more attentive to the interpersonal and, by implication, controlling aspects of verbal reinforcement was supported.

On the other hand, Anderson, Manoogian, and Reznick (1976); Dollinger and Thelen (1978); and Swann and Pittman (1977) found that in both male and female children, verbal rewards increased subsequent intrinsic motivation. These studies employed various tasks (respectively, free-style drawing; maze tracing and geometric design problems; and free-style drawing, a Slinky, colored bricks, and Tinker toys). Perhaps socialization differences have not yet had impact upon such young children (Deci & Ryan, 1980). With adult subjects, Weiner and Mander (1978) found that verbally delivered competence feedback alleviated the decreases in intrinsic motivation which their financial rewards induced. More strongly, Harckiewicz (1979) provided evidence that verbal praise enhanced the intrinsic interest of both females and male high school students on a hidden figures puzzle task. Finally, Zuckerman, Larrance, Porac, and Blanck (1980) found that college student subjects verbally informed of their success on SOMA increased in intrinsic motivation, whether they were female or male. (Studies demonstrating increased interest following success—e.g., Feather, 1966, 1968; Feather & Saville, 1967—are not reported here, as the controlling

aspects of praise would seem to arise less from the mere fact of success than from the subject's relationships with the person communicating it.)

Thus, the evidence for differential reactions is mixed, although integration of these studies is problematic because of age and task differences in the subject samples.

A Potential Sex-Linkage Effect

By definition, the sex linkage of a task refers to any factors that give a particular activity a distinct frame of reference (Allport, 1943) for males and females—differing degrees of past experience, varying personal relevance or value, different physical capability, dissimilar social rewards and costs for public performance (Reis, Note 2). Although tasks are typically selected serendipitously in social psychological research, an unintentionally sex-linked task may lead to misspecified conclusions when a result is attributed to gender rather than to subject-task gender congruence. For example, Sistrunk and McDavid (1971) demonstrated that females' greater conformity in previous research was due less to their gender than to the use of masculine, and hence less familiar, less ego-involving, topics.

In their review of sex differences, Maccoby and Jacklin (1974) concluded that children do adopt sex-typed interests. This would result in differences in proficiency, familiarity, and ego involvement. Greater performance effectiveness would make personal competence more salient. Familiarity may influence feelings of competence and self-determination in two ways: First, people are likely to be more certain of their expectations on familiar than unfamiliar tasks (Deaux, 1976), as more information from prior performance is available to help set standards. Second, people will expect success more readily than failure on familiar tasks (Deaux & Farris, 1977), as experience is generally associated with increasing competence. Since expected outcomes are more likely to be attributed internally, and unexpected outcomes externally (Deaux, 1976), it may be deduced that relative to sex-inappropriate tasks, persons who experience success at a sex-appropriate task would attribute success more to internal than external factors (as demonstrated by Rosenfeld & Stephan, 1978; Taynor & Deaux, 1975). Consequently, success information on sex-appropriate tasks is likely to enhance intrinsic motivation, an effect that self-attributions of ability generally show (Deci, 1975; Feather, 1968; Ryckman, Gold, & Rodda, 1971).

Existing evidence also supports the contention that sex-appropriate tasks are more ego involving than sex-inappropriate tasks (Deaux & Emswiller, 1974). For example, both children and adults are more attracted to same-sex tasks than to opposite-sex ones (Montemayor, 1974; Liebert, McCall, &

Hanratty, 1971). In a study investigating children's performance in a game and their attraction to it as a function of sex-typed labels, Montemayor (1974) found that for both boys and girls, performance was highest when the game was labeled sex appropriate, intermediate when no sex label was given for the game, and lowest when the game was labeled sex inappropriate. Similarly, Stein (1971) and Stein, Pohly, and Mueller (1971) found evidence for differences in interest in a task as a function of the sex label of the task. Interest in a task is generally closely related to intrinsic motivation (Deci & Ryan, 1980).

With these findings in mind, we now turn to the effects of positive verbal reinforcement (praise) on intrinsic motivation for sex-typed tasks, the focus of the present study. As noted, Deci (1975) suggested that because of differing socialization pressures, praise enhances males' feelings of competence and self-determination, thereby increasing intrinsic motivation. For females, praise initiates a change in locus of causality from internal to external, thereby decreasing intrinsic motivation. From our prior arguments, it would seem apparent that an appropriately sex-linked task (i.e., more familiar, more ego involving) may emphasize relatively greater concerns about competence, since personally known and valued abilities are called into question. Sex-inappropriate tasks are likely to be less familiar and less ego involving, deemphasizing self-relevant feedback and giving greater weight to controlling feedback instead. We might hypothetically attribute Deci's findings (1972, 1975) to the interaction of subject sex and task linkage—rather than to anything inherent in the sexes or their socialization histories—and predict verbal praise will enhance the intrinsic motivation of females on a feminine task. Accordingly, our hypothesis is that praise will increase both sexes' intrinsic motivation on a sex-appropriate task, and decrease intrinsic motivation on a sex-inappropriate task.

EXPERIMENT 1

Method

The four independent variables in this 2 × 2 × 2 × 2 between-groups design were sex of subject, sex of experimenter, sex linkage of task, and praise-no praise (control groups). The identical task was manipulated to be masculine or feminine. The prime dependent measure was time spent playing in a free-choice period, as is customary in intrinsic motivation research (Deci, 1975).

Subjects. Subjects were 70 males and 69 females enrolled in introductory psychology who were fulfilling a course requirement by participating. Subjects were randomly assigned to one of eight experimental conditions. Two males and one female served as experimenters.

Procedure. The procedures were exactly those used by Deci (1972, 1975), except for the task used. A sex-neutral task was employed, the "Spill and Spell" word-cube game, consisting of 30 letter cubes. Pretesting established the task's appropriateness in that it was intrinsically interesting and readily manipulable as to sex linkage.

During the experimental session, the experimenter escorted a single subject to a laboratory room and, following a brief introduction, took a position behind a one-way mirror. Subsequent interaction was via an intercom system. All subjects knew they were being observed during the experimental task.

Subjects were told this was an experiment "to help us find some fun and interesting ways to build vocabulary skills." The word-cube game required subjects to form interlocked words from letter cubes tossed randomly. Subjects working on the masculine task were asked to create 12 words that referred to masculine characteristics or objects. Those working on the feminine task were asked to create 12 words that referred to feminine characteristics or objects. They were allotted 20 minutes to complete the 12 words. The masculine or feminine category was allegedly "randomly" chosen by the experimenter from a group of topics (e.g., rock groups, countries) visible to the subjects on index cards placed on the experimental table. A maximum of three minutes was allowed for each successive toss, and subjects could toss as often as they liked until the criterion of 12 words had been formed. Subjects were informed that their performance was being evaluated on three dimensions: (a) the number of letters they used in each of the words, (b) the speed with which they completed the twelve words, and (c) the number of tossess of the letter cubes.

In the verbal reinforcement condition, subjects received four verbal praise prompts, each one after the completion of three words. These prompts were the same as those used by Deci (1972, 1975): (a) at 3 words, "O.K., good, you got those first few words much faster than the average": (b) at six words, "O.K., that's about the fastest anyone's gotten six words yet"; (c) at 9 words, "Alright, very good, most people take much longer to get this far"; and (d) at 12 words, "O.K., you did real well. You got the 12 words. Most people don't get this far." No comments were made to control subjects.

After completing the word construction, subjects were told that the second part of the experiment entailed filling out one of four possible questionnaires, the appropriate one to be determined by their performance. This manipulation provided a rationale for the experimenter's absence, ostensibly to enter the subject's data into a computer to determine the appropriate questionnaire. During this "free-time period," subjects were told they could do anything they liked, such as read any of the popular

magazines on a side table, or play with the puzzle, as long as they remained in the room. The primary measure of intrinsic motivation was the amount of time that the subject spent working on the puzzle during the eight-minute free-choice situation. A second experimenter, who was blind to the experimental condition,[3] recorded the subject's behavior during the first eight minutes of the free-choice period. The criterion for whether a subject was working on the task during the free-choice period was that he or she had to be manipulating the letter cubes into words and/or examining the alternative stack of word category cards.

The posttask questionnaire, including manipulation checks, attribution measures, and perceptions of the task, was then administered. The first 9 questions assessed subjects' perceptions of the task: their success in devising an effective strategy, enjoyment, future interest, perceived challenge, importance of doing well, how well they did, expectations for future performance, valuing of word-puzzle skills, and past experience. The next 4 questions measured subjects' attributions of their performance to ability, effort, task difficulty, and luck. A final question asked if they thought males or females were more likely to do better on the task. All questions appeared in standard 1-9 point scale format, with endpoint anchors defining the polarities. For the attribution questions, scale anchors defining the polarities. For the attribution questions, scale anchors were 1," hindered my performance"; 5, "had no effect"; and 9, "helped my performance." After this questionnaire was completed, all subjects were debriefed.[4]

Results

All results were analyzed as unweighted means in 2 × 2 × 2 × 2 between-groups analyses of variance. The independent variables were subject sex, sex linkage of the task, praise-no praise, and experimenter sex. The latter variable was included for control purposes. However, because only one female experimenter was used, gender and individuality are confounded, making inference about experimenter sex effects ambiguous and undesirable. Although experimenter sex effects do not alter the pattern of results substantially, they will be noted wherever a significant effect occurred. (A copy of these analyses may be obtained from the second author.)

[3]Scheduling problems forced the primary experimenter to serve as second experimenter for 8 subjects, therefore making him aware of the subjects' performance.

[4]An objective measure of fear of success (Zuckerman & Allison, 1976) was administered to 91 of the 139 subjects in Experiment 1 three months after participation. Analysis of this measure did not yield any significant results and will not be discussed further.

Manipulation Checks. To measure perceptions of the sex linkage of the task, subjects indicated their feelings on a 9-point scale ranging from "females more likely to do well" (1) to "males more likely to do well" (9). The sex linkage of the task was manipulated successfully, $F(1, 23) = 147.56$, $p < .001$, $d = 2.19$.[5] Subjects perceived the masculine task as masculine ($M = 6.35$), and the feminine task as feminine ($M = 2.78$). Unexpectedly, across the praise manipulation, male subjects perceived the task as more female oriented than did the females (male $M = 3.53$, female $M = 5.60$; $F(1, 123) = 50.07$, $p < .001$, $d = 1.28$). However, sex of subject did not interact with task-sex linkage nor feedback, nor were there any other significant or borderline effects (all ps $> .10$). Therefore, the sex linkage manipulation may be considered effective.

As anticipated, praised subjects reported doing better than nonpraised subjects (Ms = 5.44 vs. 4.54, $F(1, 123) = 12.95$, $p < .001$, $d = .65$). A few unintended effects also emerged, however: a sex main effect, such that females perceived themselves doing better than males (5.26 vs. 4.63, $F(1, 123) = 8.02$, $p < .01$, $d = .51$) and a subject sex × feedback interaction, $F(1, 123) = 5.65$, $p < .05$, $d = .43$. These were further qualified by interactions of experimenter sex × feedback, $F(1, 123) = 5.15$, $p < .05$, $d = .41$, and experimenter sex × task-sex linkage, $F(1, 123) = 4.40$, $p < .05$, $d = .38$. Inspection of the means revealed that these interactions stemmed from the fact that all praise cell means were greater than those for the corresponding no-praise cells, except for female subjects with male experimenters on the masculine task (praise $M = 4.86$, no-praise $M = 6.00$) and the feminine task (praise $M = 5.56$, no-praise $M = 5.88$). These differences, particularly the feedback × subject sex interaction, will need to be reviewed in interpreting intrinsic motivation effects later on.

Intrinsic Motivation. Table I presents the mean number of seconds spent playing with the word puzzle during the free-choice period. Analysis of variance revealed a significant main effect for praise, $F(1, 123) = 10.82$, $p < .005$, $d = .59$, such that praised subjects played with the letter cubes longer cubes longer during the free-choice period (272.2 seconds) than control subjects (169.1 seconds). Table I shows that this difference appeared in all pairings of the praise and no-praise cells, across all combinations of the three gender variables. A significant subject sex × sex linkage of task interaction also emerged, $F(1, 123) = 11.28$, $p < .001$, $d = .60$, indicating that females played longer when the task was feminine (299.7 vs. 178.1 seconds), while males played longer when the task was masculine (158.0 vs.

[5] d is an estimate of the size of the effect, expressed in standard deviation units (Cohen, 1977) and computed as $2\sqrt{F}/\sqrt{df}$ here. Cohen considers a d of .20 to be small effect, .50 a medium effect, and .80 a large effect.

Table I. Mean Seconds Spent Playing with the Word Puzzle During the Free-Choice Period[a]

	Females		Males	
	Feminine task	Masculine task	Feminine task	Masculine task
No praise	242.3	114.0	118.9	200.9
	(19)	(15)	(18)	(17)
Praise	357.0	241.9	197.0	297.6
	(19)	(16)	(18)	(17)

[a]Time is in seconds out of a maximum of 480 seconds. The number of subjects per cell is in parentheses.

246.8 seconds). It is important to note that the feedback × subject sex × sex linkage of task interaction, namely the effect posited in our hypothesis, was not significant, $F(1, 123) = .00$, $p < .50$, $d = .0$. However, the feedback × subject sex effect demonstrated by Deci (1972; Carone, Note 1) was also not significant, $F(1, 123) = .34$, $p < .50$, $d = .10$.[6]

It is worth noting that analysis of the number of words formed during the free-choice period confirmed the two major results reported above: Subjects formed more words when praised than when not (4.95 vs. 2.91; $F(1, 123) = 5.75$, $p < .05$, $d = .43$), and after working on sex-appropriate than sex-inappropriate words (males = 3.33 vs. 2.18; females = 6.20 vs. 4.00; $F(1, 123) = 3.87$, $p < .06$, $d = .35$). Analyses of the content of these words revealed that subjects made more words of the same gender linkage as during the task. No other effects were significant.

Secondary Measures—Questionnaire Data. The remaining questionnaire items were analyzed concurrently with a multivariate analysis of variance, to eliminate potentially spurious results arising from a large number of univariate significance tests. The multivariate composite for all main effects was significant: subject sex, $F(7, 117) = 4.27$, $p < .001$, $d = .38$; sex-linkage of task, $F(7, 117) = 3.33$, $p < .005$, $d = .38$; and feedback, $F(7, 117) = 2.66$, $p < .05$, $d = .30$. No interactions were significant or approached significance (all $ps > .10$).

Univariate tests on the components of the significant multivariate effects were undertaken to ascertain their origin and direction. Praise increased subjects' enjoyment of the activity ($Ms = 6.40$ vs. 5.21, $F(1, 123) = 16.88$, $p < .001$, $d = .74$); their desire to attempt similar puzzles in the future ($Ms = 6.45$ vs. 5.64, $F(1, 123) = 7.09$, $p < .01$, $d = .48$); strengthened feelings that they could succeed on similar puzzles in the

[6]One other effect also appeared, namely, a significant experimenter sex × subject sex × task-sex linkage interaction ($F(1, 123) = 4.20$, $p < .05$), which revealed that males' greater interest in the masculine task was more likely with male than female experimenters, although present for both.

future (*M*s = 6.38 vs. 5.95, $F(1, 123) = 4.07$, $p < .05$, $d = .36$); increased valuing of the skills involved in the activity (*M*s = 6.78 vs. 6.05, $F(1, 123) = 6.05$, $p < .015$, $d = .44$); and enhanced perceptions of having devised an effective strategy (5.74 vs. 5.03, $F(1, 123) = 4.98$, $p < .05$, $d = .40$).

Overall, females, relative to males, displayed greater ego involvement with the word puzzles. First, females enjoyed the task more than males (*M*s = 6.45 vs. 5.17, $F(1, 123) = 19.42$, $p < .001$, $d = .79$). Second, females expressed a greater desire to attempt similar puzzles in the future (*M*s = 6.79 vs. 5.34, $F(1, 123) = 20.84$, $p < .001$, $d = .82$) and perceived that they could do well on such puzzles in the future (*M*s = 6.40 vs. 5.93, $F(1, 123) = 4.90$, $p < .05$, $d = .40$) more than males did. Third, females valued the skills and abilities word puzzles involve more than males did (*M*s = 6.81 vs. 6.01, $F(1, 123) = 7.34$, $p < .01$, $d = .49$). Finally, females indicated more experience with such puzzles (*M*s = 4.95 vs. 4.13, $F(1, 123) = 5.83$, $p < .05$, $d = .44$). These differences, in the absence of an interaction with sex linkage of task, suggest that the word game may not have had the identical meaning for female and male subjects, contrary to our hopes. We will comment on this later.

The multivariate sex linkage effect arose in that all subjects found the feminine words more enjoyable than the masculine (6.27 vs. 5.34, $F(1, 123) = 10.23$, $p < .005$, $d = .58$).[7]

Analysis of the attribution data revealed interesting effects. First, praise increased attributions to all causes: ability (6.64 vs. 5.79, $F(1, 123) = 8.46$, $p < .005$, $d = .52$); effort (7.24 vs. 6.62, $F(1, 123) = 6.05$, $p < .05$, $d = .44$); task difficulty (4.63 vs. 4.21, $F(1, 123) = 3.03$, $p < .10$, $d = .31$), and luck (5.66 vs. 4.85, $F(1, 123) = 11.34$, $p < .001$, $d = .61$). In addition, females perceived effort as affecting their performance more than males did (7.31 vs. 6.55, $F(1, 123) = 8.90$, $p < .005$, $d = .54$), and the feminine task was seen as more heavily affected by effort than the masculine task (7.22 vs. 6.63, $F(1, 123) = 5.37$, $p < .05$, $d = .42$). A significant feedback × subject sex × task-sex linkage effect also emerged, $F(1, 123) = 5.89$, $p < .05$, $d = .44$. On sex-appropriate tasks for which praise was given, both sexes were more likely to attribute their performance to task difficulty than on sex-appropriate tasks without praise or sex-inappropriate tasks. Cell means are presented in Table II.

An internal-external index created by subtracting task difficulty and luck attributions from ability and effort revealed no significant effects.

[7]The multivariate experimenter sex effect also was significant: experimenter sex [$F(7, 117) = 2.15$, $p < .05$, $d = .27$]. Subjects with female experimenters reported the tasks as more challenging (6.82 vs. 6.02, $F(1, 123) = 7.32$, $p < .05$, $d = .49$), and as more important to do well (6.48 vs. 5.85, $F(1, 123) = 3.96$, $p < .05$, $d = .36$).

Table II. Mean Attributions for Performance Outcome

	Female subjects				Male subjects			
	Feminine task		Masculine task		Feminine task		Masculine task	
	Praise	None	Praise	None	Praise	None	Praise	None
Ability	6.41	6.20	7.06	6.08	6.69	5.86	6.41	4.99
Effort	7.56	7.25	7.53	6.69	7.35	6.45	6.80	5.58
Task Difficulty	5.21	4.27	4.18	4.68	4.43	4.26	4.68	3.59
Luck	5.67	4.89	6.05	5.10	5.85	4.83	5.07	4.57

[a]The greater the number, the more subjects attributed the outcome to that factor. Scales ranged from 1 = (attribute) hindered my performance to 9 = (attribute) helped my performance.

Similarly, neither did a repeated measures analysis examining the four attribution factors as a within-subject variable.[8]

Secondary Measures—Task Performance. Analysis of performance times confirmed the unfortunate confounding effect suggested in the manipulation checks and questionnaire data; namely, the word-cubes task retained a sex-linked effect of its own. Performance times for males and females, and on masculine and feminine tasks, were significantly different ($F(1, 123) = 11.65$, $p < .001$, $d = .62$, for subjects; $F(1, 123) = 5.86$, $p < .05$, $d = .44$, for tasks). Males generally took longer to complete the 12 words (*M*s = 897.2 vs. 762.3 sec.), and all subjects spent more experimental time completing the feminine task (*M*s = 877.6 vs. 781.9 sec.). Therefore, to ensure that the previous free-time behavior results were not confounded with task performance, the analysis of free-choice time was repeated, covarying for experimental time scores. Partialing did not change the previous results: $F(1, 122)$ for praise is now 11.18, $p < .005$, $d = .60$; and the subject sex × task-sex linkage effect $F(1, 122)$ is now 10.85, $p < .005$, $d = .60$. No new effects emerged. Similar covarying for the "which sex is more likely to do well" manipulation check item also failed to affect these results: *F*s(1, 122) are 10.99 and 11.01, respectively, *p*s < .005, *d*s = 60. Thus, whatever its origin, this confound does not appear responsible for our intrinsic motivation results.

[8]Experimenter sex × task-sex linkage interactions indicated that attributions to ability and to effort were stronger for tasks inappropriate to the experimenter's sex (ability $F(1, 123) = 4.57$, $p < .05$, $d = .38$; effort $F(1, 123) = 4.70$, $p < .05$, $d = .39$). Obviously, self-presentational factors may be operative here.

DISCUSSION

While this study failed to support our original hypotheses, it also failed to replicate Deci's (1972, 1975) original results. Instead, a different, and perhaps more interesting, set of results were obtained. Across all levels of the three gender variables we employed, positive verbal reinforcement enhanced intrinsic motivation, the magnitude of this increment paralleling Deci's result with males (103 sec. here vs. 123 and 140 sec). Additionally, subjects also found a sex-appropriate task more intrinsically interesting than a sex-inappropriate one, regardless of whether they were praised for performance. It is noteworthy that females' and males' free-time scores were equivalent on sex-appropriate tasks. Had only one gender-typed task been used, our data would have revealed a "sex difference" in intrinsic motivation.

The question of how to reconcile the differences between these experiments and, more vitally, how to specify the conditions under which praise facilitates or debilitates intrinsic motivation remains, of course. We see two likely candidates. The first centers on task differences in the two experiments. Not only do the word-cube and SOMA puzzles vary inherently, but they seem to differ on the sex linkage dimension as well. Despite our endeavors to manipulate the gender-typed features of the word-cube game, it retained some features making it more interesting, ego involving, and familiar for females. In other words, if SOMA is conceivably a masculine activity, then the word cubes may be a feminine activity, an interpretation consistent with Maccoby and Jacklin's (1974) conclusions about female verbal skills. These results may therefore be applicable only to a feminine sex-linked task.

A second and equally viable alternative concerns cohort differences. Deci's research was conducted in 1971 and 1972, ours in 1978 and 1979, both at the same university. During those eight years, considerable changes occurred in the socialization processes affecting adolescents and young adults. Particularly, women have been encouraged toward achievement, individual competence, and self-determination more thoroughly than in the past. As a result, social rewards may no longer come to connote controlling functions and instead may convey information about one's abilities to females, as they do to males. If this is the case, then praise should currently enhance females' intrinsic motivation, rather than diminish it.

EXPERIMENT 2

Experiment 2 was designed to test the prediction that praise should enhance females' intrinsic motivation. If decreases in females' intrinsic

motivation following praise are due to differential socialization, then the phenomenon should be most prevalent on a masculine task, and among females who accept the sex-traditional role. Peplau (1976) concluded that traditional females are most likely to perform well in feminine activities, and poorly in masculine activities, as one manifestation of their sex-role orientation. Accordingly, a group of traditional females, as defined by the Bem Sex Role Inventory (BSRI; Bem, 1974), was randomly divided into praise and no-praise groups. All procedures exactly replicated those of Deci (1972, 1975) and of our Experiment 1, notably including the use of SOMA, the identical praising statements, and students from the same course at the same university. To maximize potential controlling functions, two male experimenters were used. If Deci's hypothesis concerning females is applicable today, then praise should decrease traditional females' intrinsic motivation, and the result of Experiment 1 may be attributed to task differences. If, as we suspect, Experiment 1 reflects cohort changes, then praise should increase intrinsic motivation.[9]

Method

Traditional females, as assessed by the Bem Sex Role Inventory, were randomly assigned to receive positive verbal feedback or no feedback from a female experimenter. The experimental activity was the SOMA puzzle.

Subjects and Procedure. Subjects were 24 females enrolled in introductory psychology who fit Spence, Helmreich and Stapp's (1975) criteria for traditional femininity on the Bem Sex Role Inventory. The Bem scale was administered to the entire introductory psychology course during class time. Class median were 97 on both the masculinity and femininity scales. Students were considered potential subjects if their masculinity score was less than 97, their femininity score was greater than 97, and the difference between the two scores was at least 10 points. These medians are similar to those derived from other studies using the BSRI.

All procedures were identical to those used in Experiment 1 and by Deci (1972, 1975). The experimental task, SOMA, is a puzzle made of seven pieces of plastic. Each piece appears to be composed of three or four connected one-inch cubes, and there are a total of 27 one-inch cubes in the

[9]We might note the reasons for not including males or androgynous females in Experiment 2. Our purpose was not to note sex differences among these groups, but to see if traditional socialization among females produces decreases in intrinsic motivation following verbal praise. If an increment occurs, even one less than that nontraditional females or males might have shown, then it cannot be argued that praise causes traditionally socialized females to lose intrinsic interest in a task. For this reason, the inclusion of the other groups was deemed superfluous.

seven pieces. The seven pieces can fit together to form numerous different configurations.

During the experimental session, subjects were first given a practice puzzle and then asked to reproduce four configurations depicted on paper. The time to complete each figure was measured with a stopwatch, and if a subject was unable to complete a configuration within 10 minutes, she was stopped and shown how to do it. This allowed her to see that all of the figures were possible.

Experimental subjects were praised with the same comments as in Experiment 1 (e.g., "That's about the fastest anyone's gotten that puzzle yet.") after each of the four puzzles. Again, these were the exact prompts used by Deci (1972). A subject who did not solve a configuration was told that it was one of the most difficult of all configurations used and that most people were unable to solve it, so she had not done badly. Control subjects received no feedback.

As in Deci's studies and Experiment 1, the operational measure of intrinsic motivation was the number of seconds spent playing with the puzzle during the eight-minute free-choice period. All subjects then completed a questionnaire similar to that used in Study 1, followed by a full debriefing.

Results

Manipulation Checks. Subjects in the praised group reported that they did better than no-praise subjects (Ms = 5.92, vs. 4.67, $F(1, 22) = 5.48$, $p < .05$, $d = 1.00$). Verbal feedback did not affect subjects' perceptions of the task's sex linkage, $F(1, 22) < 1$. Thus, the manipulations produced the desired effects, but no unintended effects.

Intrinsic Motivation. Praise increased the free-choice time of all subjects (Ms = 367.9 vs. 242.0 sec., $F(1, 22) = 3.17$, $p < .09$, $d = .76$, two-tailed). These results are consistent with those reported in Experiment 1, and contrary to Deci's data (1972, 1975), thereby supporting our "changes-in-cohort-group" hypothesis. Although this F only approaches conventional levels of significance, the mean difference (126 sec., $d = .73$) compares favorably with Deci's males (1972 – 123 sec., $d = .64$; 1975 – 140 sec., $d = .74$) and our Experiment 1 (103 sec., $d = .57$). Furthermore, no-praise subjects in this study played with the puzzle for virtually the same time as in Deci's (1972) study – 242 versus 255 seconds.

Secondary Measures. Praised subjects reported themselves more able to devise a means of solution for the puzzle than the control group Ms = 6.00 vs. 4.42, $F(1, 22) = 4.41$, $p < .05$, $d = .90$). No other questionnaire or attribution items approached significance (all ps $> .10$). An attributional index of internality-externality similar to that employed in Experiment 1

was also nonsignificant. As expected, the praised and control groups did not differ in the time necessary to complete the four SOMA examples (*M*s = 952.3 vs. 962.6 sec.; $F(1, 22) = .00$, $p > .50$, $d = .00$).

CONCLUSION

Taken together, our data offer support for the contention that positive verbal feedback enhances females' and males' intrinsic motivation similarly. In Experiment 1, verbal praise increased all subjects' subsequent interest in the activity, regardless of their gender or the task's gender congruence. Experiment 2 demonstrated that praise can enhance traditional females' intrinsic motivation even on a task that had shown striking differences in prior research. Thus, praise can connote positive information about competence for females as well as males.

How may these conclusions be reconciled with those of Deci (1975)? Although a revision of cognitive evaluation theory's distinction between the controlling and informational aspects of rewards may seem necessary, we do not believe such a change is warranted. It seems reasonable to attribute the differential results to the dramatic change in women's sex-role socialization in the intervening eight years. Time differences are difficult to validate experimentally. However, the use of the same university's subject pool and identical scenarios make the inference of socialization changes seem reasonable. Although the socialization of females and males in our culture is yet far from equivalent, feamles are more often encouraged to seek personal accomplishment, competence, and self-determination than in the past. Females, for example, are more likely to pursue higher education and vocational goals, and to seek education-relevant professions, than in the past. As a result, competence and self-determination are salient issues; and a given verbal reward may be more likely to assess these aspects of the self, rather than the controlling aspects. In other words, rewards may still possess controlling and informational functions. Verbal rewards that are administered in a manner to emphasize controlling functions will decrease intrinsic motivation, while those that stress competence will increase intrinsic motivation (Deci & Ryan, 1980; Pittman, Davey, Alafat, Wetherill, & Wirsul, 1979). The important points are that praise now may have identical effects on females and males, and praise may enhance females' similar motivation.

This research also has implications for understanding people's behavior on sex-linked tasks. We found that both sexes were more intrinsically interested in sex-appropriate than sex-inappropriate activities. Notwithstanding the fact that these differences are interesting in their own right, they may have substantial undetected impact on the conclusions

drawn in psychological research and application. The use of an unidentified sex-linked activity may yield what appears to be an inherent sex difference—be it attributed to biology, psychology, or sociology. Often these results are more likely due to a gender congruence difference, resulting in misspecified conclusions. For example, this research revealed gender congruence results for intrinsic motivation. Had we used only the feminine task, we would have concluded that females were more intrinsically interested, and begun searching for viable interpretations of this "sex difference." Gender congruence may be a better target for this search, as the result of Experiment 1 indicated. The problem is more severe when gender congruence yields an interaction with social behavior, producing behavior in opposing directions as we hypothesized for Experiment 1, than a main effect such as we found.

This research has demonstrated a change in how social rewards are perceived by people, a change that may be traced to the increasing importance of effectance among women. Verbal praise was taken as information about competence and self-determination by both sexes. It is not implied that verbal reinforcement does not have controlling components also, as Deci (1975) has theorized. However, the conditions under which they predominate have not been identified yet. Gender is apparently not one of them today.

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