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# Effects of Perceived Extrinsic Versus Intrinsic Teacher Motivation on Student Reactions to Skill Acquisition

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*Musically naive students were taught a piano lesson. In a paid teaching condition, the teacher was portrayed as being extrinsically motivated by a \$25 payment. In a second condition, the teacher was portrayed as an intrinsically motivated volunteer. The confederate teacher was blind to conditions and gave the same standardized lesson to all students. Students in the volunteer condition perceived the teacher as exhibiting greater enjoyment, enthusiasm, and innovation relative to those in the paid condition. They also enjoyed the lesson more, reported a more positive mood, and were more interested in further learning. During a free-play interval, students in the volunteer condition exhibited greater exploratory activity than those in the paid condition.*

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Cognitive evaluation theory (Deci & Ryan, 1985) provides a useful perspective from which to view potential influences on teaching and learning. According to Deci and Ryan, people have a need to be self-determining and competent. Events that support these elements of personal autonomy promote an intrinsically motivated orientation toward activities, characterized by enjoyment, spontaneous activity engagement, exploration, and creativity. Externally controlling events undermine personal autonomy, resulting in an extrinsic orientation to activities and correspondingly low intrinsic motivation. Research shows that intrinsic interest can be reduced by extrinsic reward contingencies offered merely for activity engagement (e.g., Lepper, Greene, & Nisbett, 1973) and by controlling evaluation standards (e.g., Harackiewicz, Manderlink, & Sansone, 1984). Conversely, intrinsic motivation is increased by autonomy-supporting events such as positive competence feedback (e.g., Enzle & Ross, 1978).

Teacher-student interactions include many factors that potentially support or negate personal autonomy. When an externally constrained teacher imposes lessons on a dependent and constrained learner, for example, there are threats to the personal autonomy of both parties. The result for teachers and learners alike may be low levels of enjoyment, exploration, and creativity. Educational contexts that are relatively free of coercive forces, in contrast, should promote the personal autonomy of both teacher and learner and thus should encourage intrinsically motivated approaches to the joint enterprise of teaching and learning.

Indeed, intrinsic and extrinsic motivational influences on teachers affect both teaching style and success of teaching attempts. For example, Garbarino (1975) found that externally constrained (i.e., rewarded) teachers were more critical and demanding of their students than unconstrained (i.e., volunteer) teachers. As well, students who were taught by rewarded teachers made more errors while learning the target skill. Flink, Boggiano, and Barrett (1990) similarly found that teachers who were externally pressured to produce good student performance were more controlling in their instructional style (cf. Harackiewicz & Larson, 1986) and less effective in their teaching than teachers who were merely asked

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to help their students (see also Deci, Spiegel, Ryan, Koestner, & Kauffman, 1982). Finally, other research shows that learners enjoy the educational process less when taught by demanding and controlling teachers than when taught by teachers who adopt relatively autonomy-supportive instructional styles (Grolnick & Ryan, 1987; Ryan & Grolnick, 1986) and when they learn under constrained rather than autonomy-enhancing instructional sets (Benware & Deci, 1984).

These detrimental motivational effects on students that have been established in previous research can be understood as arising *solely* from the influence of extrinsic constraints on the teacher's instructional style. Our research examined an additional, unexplored factor that might influence students' intrinsic interest in learning and in newly acquired skills. Our focus reflects recent work suggesting that context and setting conditions related to learning can affect intrinsic motivation (Sansone, Sachau, & Weir, 1989). Because educational contexts consist of joint activities for the teacher and learner, events that define the teacher's social role should also be sources of influence on the learner. When a learner becomes aware that his or her teacher is extrinsically constrained, the student becomes part of an extrinsically constrained relationship, independently of the impact of extrinsic constraints on the teacher's instructional style. Thus, when extrinsic constraints on a teacher become salient, it seems likely that a set of expectancies will be cued in the student. We propose that in extrinsically constrained educational contexts, students will expect their teachers to show little intrinsic interest in the activity and to be rigid and nonspontaneous in their teaching style. Students will also expect that they will find the learning experience to be boring and the new skill to be of little interest. Relatively unconstrained educational contexts, however, should cue student expectancies of high teacher intrinsic motivation and the anticipation of a spontaneous and innovative teaching style. Students in relatively unconstrained educational contexts should therefore be more likely than students in extrinsically constrained educational contexts to enjoy the process of learning and to value newly acquired skills.

If differential expectancies influence subsequent interpretations of the educational interaction, students in extrinsically constrained and unconstrained contexts should differ in their perceptions of the learning experience and of the acquired skill. We propose that these expectancy-based differences can arise *without* corresponding objective differences in teaching style or in skill acquisition between constrained and unconstrained educational contexts. Given identical teaching styles, instructional content, and skill acquisition, we hypothe-

sized that students in an extrinsically constrained educational context would be less intrinsically interested in an educational undertaking and the skill to be learned than students in a relatively unconstrained educational context.

In a test of this general hypothesis, we varied only whether subjects believed that their teacher had been paid to teach them (i.e., was extrinsically constrained) or had volunteered to do so (i.e., was relatively unconstrained). The teacher was blind to this constraint manipulation, and all students were given a standardized lesson that did not vary in content or style between conditions. Compared with students who believed their teacher was a volunteer, we expected that students who believed their teacher was paid would perceive the teacher as less intrinsically interested in the skill being taught, would perceive the teacher's style as more structured and less innovative, would enjoy the learning experience less, would exhibit less intrinsic interest in the activity, and would be less interested in further learning. We are thus proposing general differences in learner enjoyment and in the value of learning attributable solely to perceptions of the teacher's motivation for engaging in the educational interaction.

## METHOD

### *Subjects*

Subjects were 35 undergraduates enrolled in introductory psychology courses. Participation was restricted to students who had no previous musical training. Data from 3 subjects were deleted because of procedural errors ( $n = 2$ ) and demand awareness ( $n = 1$ ). The remaining 32 subjects (17 males and 15 females) were assigned randomly in equal numbers to conditions.

### *Apparatus and Materials*

The teaching instrument was an 88-key Yamaha CLP-350 electronic keyboard. An audiorecorder concealed beneath the keyboard was activated prior to the session. A set of headphones was situated on a nearby table. A camcorder was used as part of the cover story and was aimed toward the keyboard but was not operational. Teaching materials included a music notation diagram, a list of expressive musical sounds (e.g., thunder, rain), and four short musical pieces that were scored with musical notation and a numbered fingering system.

### *Procedure*

The experimenter met the subject and a confederate who posed as a piano teacher and seated them at a table located away from the piano. The experimenter ex-

plained that the research was investigating how people teach new skills. He then introduced the subject to the confederate teacher, explained that the subject would be taught a novice-level piano lesson, and indicated that he would make a videotape of the lesson for later examination. Emphasis was placed on the teacher's instructional performance, not on the learner's performance. Finally, the experimenter said that the teacher and learner would be interviewed separately after the session.

The experimenter then directed the teacher to sit at the piano, put on the headphones, and "warm up." The teacher remained blind to conditions because he or she was oriented visually away from the experimenter and the headphones prevented the teacher from hearing the manipulation. The experimenter (seated across a table from the subject) then opened a file folder, revealing one of two sets of materials that had been prepared in advance. The experimenter had heretofore remained blind to conditions. This folder contained either an envelope marked *Petty Cash* (cuing the paid condition) or a typed letter (cuing the volunteer condition). The file also contained, in both conditions, a page from a local newspaper's classifieds.

***Paid teaching condition.*** For subjects in the paid condition, the experimenter tapped his finger on the classified ads and said, "I don't know if you happened to see our ad in the newspaper, but that's how we hired (confederate's name) to do your lesson today. Just bear with me while I get his (her) money ready." The experimenter took \$25 from the petty cash envelope and signed a letter of acknowledgment. He then placed the money and the letter in a second envelope, on which he wrote the teacher's name.

***Volunteer teaching condition.*** In the volunteer condition, the experimenter tapped his finger on the classified ad page and said, "I don't know if you happened to see our ad in the newspaper, but that's how (confederate's name) came to volunteer to do your lesson today. Just bear with me while I sign the department's thank-you letter for her (him)." He signed the letter and put it in an envelope, on which he wrote the teacher's name. To keep the confederate teacher blind to conditions, \$25 had been placed in the envelope by an assistant before the session. The experimenter ensured that the subject did not see the money.

In both conditions, the experimenter and subject proceeded to the piano after the experimental manipulation. The experimenter tapped the teacher's shoulder to get his or her attention and unplugged the headphones from the keyboard. The teacher rose, and the experimenter handed the teacher the envelope. The

teacher looked inside the open flap and said "Thank you" in a neutral manner. Because this envelope contained an identical sheet of folded paper and \$25 in both conditions, the teacher remained blind to conditions throughout the procedure. From the subject's perspective, however, the teacher had thanked the experimenter for the \$25 payment (in the paid teaching condition) or had merely acknowledged receipt of a letter (in the volunteer teaching condition). The experimenter then seated confederate and subject at the piano, ostensibly turned on the camcorder, and left the room after telling the teacher to contact the interviewer in a nearby office after the lesson.

***Piano lesson.*** Rehearsal ensured that the teacher gave a standardized piano lesson to all subjects. The lesson covered basic music notation, familiarization with the instrument (e.g., making "thunder" and "rain" sounds), and mastering a short song. After spending a brief period with the first two lesson elements, the confederate taught the subject to play a short version of "God Rest Ye Merry, Gentlemen," using a numbered fingering system. This system included all the fingers of both hands and covered both treble and bass clefs of the keyboard. The lesson ensured that all subjects could achieve a competent two-handed rendition of the song.

The exact wording of the piano lesson was scripted and was delivered verbatim from memory. Delivery style and vocal quality were similarly practiced and standardized for uniformity. The wording of the script was free of language that suggested either controlling or noncontrolling intentions or invitations for the subject to exercise personal autonomy. Delivery style was neither approving nor critical, and vocal quality was standardized to express neither excessive approval nor impatience. For those portions of the script that necessarily varied depending on the subject's performance during a lesson element, contingency statements were prepared on the basis of pilot testing. For example, when a subject struck an F rather than an F-sharp, the teacher said, "Okay, that was an F rather than an F-sharp. The correct key is outlined in yellow on the diagram. Let's try that again, please." When the subject completed a section of the lesson correctly, the teacher used one of a sequence of scripted statements, such as "Good" or "That's correct," and then proceeded with the next section of the lesson.

A skill acquisition criterion of playing the song once without error was established in advance to determine when the lesson had been successfully taught. The teacher began by explaining the numbering system and how to orient the hands on the keyboard by locating middle C. After demonstrating the song, the teacher led the subject

through a trials-to-criterion procedure. A trial commenced at the beginning of the song and terminated with an error or with a successful completion. When the subject made an error, the confederate explained the mistake and how to correct it and then initiated a new trial. When the subject reached the acquisition criterion, the teacher announced the end of the lesson and summoned the interviewer (another confederate). This second confederate, also blind to conditions, entered the room and explained that he or she would take the teacher and subject in turn to his or her office for a 10-min interview. The teacher was to be first, and the confederate interviewer asked the subject to remain in the room until his or her turn. The interviewer led the teacher out of the room, taking along the camcorder. The concealed audiorecorder recorded subjects' piano-playing behavior during the 10-min interval.

After the free-play interval, the interviewer returned and asked the subject to complete a questionnaire while he or she conducted the teacher's interview. The questionnaire assessed subjects' enjoyment of and interest in the learning experience, their perceptions of the teacher and his or her teaching, subjects' mood following the lesson, and the effectiveness of the manipulation. The interviewer returned after 5 min and conducted a suspiciousness probe and debriefing.

## RESULTS<sup>1</sup>

### *Equivalence of Skill Acquisition and Perceived Teacher Expertise*

Tests of our hypotheses depended on the production of equivalent skill acquisition and on equivalent perceptions of teacher expertise.<sup>2</sup> Analysis of variance indicated that subjects required the same number of attempts to learn the song between conditions,  $F(1, 30) < 1$ , n.s. Subjects in the paid condition required a mean of 4.31 trials to master the song and subjects in the volunteer condition 4.50 trials. Analysis was also performed on total time required to learn the lesson,  $F(1, 30) < 1$ . The mean lesson time was 733.4 s for the volunteer teaching condition and 699.5 s for the paid condition. In addition, one questionnaire item assessed perceptions of teacher expertise. As with the other measures, there was no treatment effect for teacher expertise,  $F(1, 30) = 2.10$ , n.s.

### *Effectiveness of the Manipulation*

Three 9-point questionnaire items assessed perceptions of how intrinsically or extrinsically motivated the teacher was to conduct the piano lesson. One item asked subjects the extent to which the teacher generally enjoyed playing the piano. Analysis of variance revealed a

reliable effect,  $F(1, 30) = 9.80$ ,  $p < .01$ . Subjects rated the paid teacher's general interest as lower ( $M = 7.88$ ) than the volunteer teacher's ( $M = 8.75$ ). A second item asked subjects how much the teacher wanted to conduct the lesson. This treatment effect was significant as well,  $F(1, 30) = 5.71$ ,  $p < .03$ . The teacher's desire to teach the lesson was seen as less strong in the paid condition ( $M = 7.06$ ) than in the volunteer condition ( $M = 7.93$ ). Finally, subjects were asked to judge how free from external pressures they believed the teacher felt during the lesson. The treatment effect was not significant,  $F(1, 30) = 1.06$ . The means were 7.25 and 6.67, respectively, for the volunteer and paid teaching conditions. Hindsight suggests that this item should have referred to external pressure on the teacher to engage in the lesson, rather than to his or her teaching of the lesson itself. The payment was supposedly an inducement to teach, rather than a source of control over teaching activities. However, results of the other items confirm that the teacher was viewed as more intrinsically interested in piano playing in general, and teaching in particular, in the volunteer than in the paid condition. All questionnaire responses were assessed on 9-point scales (e.g., 1 = *not at all*; 9 = *very much*).

### *Perceptions of Teaching Style and Teacher Enjoyment of Lesson*

Ratings were obtained of the teacher's innovativeness and spontaneity during the lesson. Significant treatment effects emerged for both measures,  $F(1, 30) = 7.02$ ,  $p < .02$ , for innovativeness and  $F(1, 30) = 5.61$ ,  $p < .03$ , for spontaneity. The confederate's teaching style, though the same for all subjects, was judged as more innovative ( $M = 7.75$ ) and spontaneous ( $M = 7.00$ ) by subjects in the volunteer condition than by subjects in the paid condition ( $M$ s = 6.31 and 5.56, respectively). Subjects also rated how much they believed the teacher had enjoyed teaching them,  $F(1, 30) = 7.34$ ,  $p < .02$ . Subjects in the volunteer condition believed their teacher enjoyed giving the lesson more ( $M = 8.06$ ) than subjects in the paid condition ( $M = 7.31$ ).

### *Effects on Learners' Intrinsic Interest and Mood*

*Enjoyment of the learning experience.* Subjects rated how much they enjoyed the piano lesson and how much they enjoyed playing the song they had learned. Subjects enjoyed the lesson more in the volunteer condition ( $M = 7.88$ ) than in the paid condition ( $M = 6.38$ ),  $F(1, 30) = 14.36$ ,  $p < .01$ . Subjects in the volunteer condition also enjoyed playing the song more ( $M = 7.94$ ) than subjects in the paid condition ( $M = 6.31$ ),  $F(1, 30) = 10.50$ ,  $p < .01$ .<sup>3</sup>

*Affective reactions.* Subjects rated their mood after the lesson on four 9-point bipolar scales (*sad* vs. *happy*, *gloomy*

vs. *cheerful*, *bad* vs. *good*, *depressed* vs. *elated*). Analyses indicated significant effects of teaching condition for all indexes of mood following the lesson,  $F_s(1, 30)$  between 4.44 and 13.18,  $p_s$  between .05 and .001. Subjects taught by a supposedly volunteer teacher consistently reported a more positive mood following the lesson (e.g.,  $M = 8.25$  for the *bad* vs. *good* mood scale) than subjects taught by a supposedly paid teacher (e.g.,  $M = 7.13$  for the same scale).

**Pursuit of further learning.** Two items on the questionnaire assessed subjects' desire to learn further how to play the piano after their introductory lesson. Subjects in the volunteer condition expressed a greater desire to be able to play piano following the lesson ( $M = 7.25$ ) than subjects in the paid condition ( $M = 5.56$ ),  $F(1, 30) = 4.97$ ,  $p < .03$ . An additional item asked subjects how likely it was that they would actually take lessons if they had easy access to a piano,  $F(1, 30) = 7.24$ ,  $p < .02$ . Subjects in the volunteer condition indicated a greater interest in taking more lessons ( $M = 6.81$ ) than subjects in the paid condition ( $M = 4.63$ ).

#### Piano Playing During Free Period

Tape-recorded segments for each subject's free-play period were assessed by a judge who was blind to condition assignments. A second judge, also blind to conditions, independently rated a subsample of the recordings to assess reliability. A general activity measure consisted of cumulated time for piano playing of any kind during the 600-s period. A qualitative index of exploration consisted of judgments of the kind of piano playing exhibited during the free-play interval. Three categories of playing were derived for the qualitative index: no playing, repetitions of the test song, and new playing. The new-playing category was constructed of free-play behaviors such as (a) attempts to play one of the other three songs for which finger charts were available, (b) attempts to play other songs not explicitly part of the lesson (e.g., "Row, Row, Row Your Boat"), (c) attempts to play scales and/or chords, and (d) improvisations (e.g., altering the sounds of the electronic keyboard).<sup>4</sup> Acceptable interrater reliability was achieved for the general activity measure ( $r = .90$ ,  $p < .01$ ) and for the qualitative index of exploration (Cohen's kappa = .90,  $p < .01$ ).

Analysis of the general activity measure revealed no effect of treatments,  $F(1, 30) < 1$ , n.s. The means were 261.13 s for the volunteer teaching condition and 237.68 s for the paid teaching condition. Subjects in both conditions spent about 40% of their free time playing the piano.

The results of the exploration index are displayed in Figure 1. The chi-square analysis for this contingency ar-

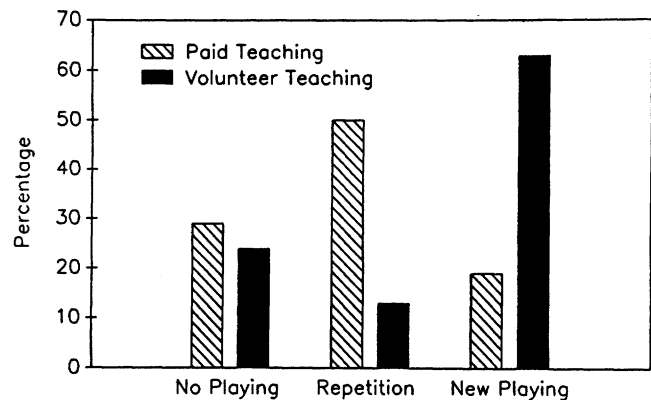


Figure 1 Students' free-play activity during the 600-s measurement period.

angement was significant,  $\chi^2(2) = 7.48$ ,  $p < .05$ . Figure 1 shows that students taught by a supposedly paid teacher were more likely to use the free interval to practice the test song (50%) than to try something new (19%). Subjects taught by a supposedly volunteer teacher showed the opposite pattern. After the lesson, 63% of these subjects initiated new songs (or improvisations), and only 13% persisted in playing the test song. Thus, subjects in the paid teaching condition focused on mastering the test song, whereas subjects in the volunteer teaching condition exhibited greater autonomy and exploration in their piano playing during the free interval.

#### DISCUSSION

The general hypothesis of this study was that learners' perception of a teacher as being extrinsically motivated would lead to relatively low intrinsic interest in the process and outcome of skill acquisition. These effects of perceived teacher motivation were hypothesized to occur in the absence of differences in skill acquisition or instructional content and teaching style. Our data provide good support for this hypothesis. Subjects taught by an ostensibly paid teacher differed from those taught by a supposedly volunteer teacher on several indexes of intrinsic motivation manifested in skill acquisition. Students in the volunteer teaching condition enjoyed being taught more than students in the paid teaching condition, they liked playing the test song they learned more, and they expressed a greater desire to learn more about playing the piano. Students taught by a volunteer teacher also reported more positive affect than students taught by a paid teacher. As well, students in the volunteer teaching condition were more likely to engage in novel exploration with the piano after the lesson than students

in the paid teaching condition. Taken together, these results suggest that the learning experience was considerably less engaging for students in the extrinsically constrained teaching condition than for students in the unconstrained teaching condition.

These effects on intrinsic motivation were not exhibited as a function of differential teaching content or teaching style on learners. Despite a lesson standardized for content and teaching style, students in the extrinsically constrained condition experienced their teacher's style as less innovative and believed that their teacher enjoyed the skilled activity less than students in the relatively unconstrained teaching condition.

Our expectancy hypothesis stated that knowledge about the presence or absence of extrinsic constraints on teachers would influence students' own interest in the process and outcome of skill acquisition. Our between-conditions comparisons on a variety of measures confirmed this hypothesis. Correlational results (see Note 3) suggest that it would also be valuable to examine differential effects of perceived intrinsic and extrinsic teacher motivation. Did learners closely calibrate their own interest on the basis of perceptions of their teacher? For students in the volunteer teaching condition, this seems to have been the case. When these students became aware that their teacher was intrinsically motivated, the teacher became an important source of information about exactly how interesting the activity was likely to be. There was a positive correlation between self-perceived motivation and perceptions of teacher motivation in the volunteer teaching condition. A similar process did not appear to occur in the paid teaching condition. When students became aware that their teacher was extrinsically motivated, there was no correspondence between ratings of their own interest and ratings of the teacher's interest. It may be that when an expectancy is created that an activity will be boring, there is no functional value in further attending to the teacher's apparent motivation as a source of information about self-perceived motivation. In other words, students may simply "turn off and tune out" when extrinsic constraints on the teacher are salient plausible causes for his or her instructional activities.

These results thus augment a growing body of evidence suggesting that features common to many educational interactions can have detrimental effects on students' intrinsic interest. Previous research has focused on how extrinsic constraints on teachers produce harmful motivational effects on students directly through changes in teaching effectiveness (e.g., Garbarino, 1975) and teaching style (e.g., Deci et al., 1982; Grolnick & Ryan, 1987; Ryan & Grolnick, 1986). Our research shows that, independently of teaching activities per se, learner perceptions of the constraining or nonconstraining na-

ture of the teacher's motivation are sufficient to affect enjoyment of learning and the value affixed to learning.

Although scale measures of interest in piano playing yielded the hypothesized difference between constrained and unconstrained teaching contexts, the quantitative measure of time spent in free activity did not. One plausible reason for the observed equivalence of activity duration across conditions is that both teaching contexts promoted activity, but for different reasons. The exploration measure indicates that all subjects approached the free interval as just that, a period during which they could exercise freedom of choice. But students in the constrained teaching condition exhibited functional fixedness (see McGraw, 1978) in their activity engagement by perseverating in the test song, while students in the unconstrained teaching condition exhibited autonomy in their activities by attempting to play new songs or improvisations. Pittman, Emery, and Boggiano (1982) similarly report evidence of perseveration as a function of task-contingent rewards and lack of interest in new versions of the rewarded activity. It appears, then, that perceptions of extrinsic constraints on teachers can lead to excessive functionality in students' activity engagement following skill acquisition, whereas student perceptions of teacher autonomy can lead to novel exploration and creativity following skill acquisition.

Because teaching and learning occur in a wide variety of contexts both inside and outside the classroom, the current results suggest general implications for educational interactions. Some educational contexts are defined primarily with reference to contractual obligations, as with piano lessons taken from a paid instructor and courses taken in school. Other educational contexts are defined primarily without reference to contractual obligations, as when two friends voluntarily form a joint social goal of sharing knowledge and skill with each other. This distinction will often correspond to that between *formal* and *informal* educational contexts. Our formulation proposes that contextual knowledge about the presence or absence of extrinsic constraints on teachers cues student expectancies about how interesting the new skill will be, how enjoyable the learning process will be, and how intrinsically motivated the teacher is likely to be. Our results suggest that these expectancies would lead students in formal educational contexts to approach their educational experience in a less intrinsically motivated manner than would occur in informal educational contexts. These expectancies, however, should also be subject to independent sources of confirming and disconfirming evidence (e.g., teaching style, direct statements by the teacher). For example, formal educators might override initial student expectancies of a boring and uninteresting learning experience by encouraging student autonomy in the learning process and

by demonstrating their own intrinsic interest in the subject matter being taught. However, our correlational results suggest that overriding negative expectancies could be a formidable task. If initial context-based expectancies of lack of interest obviate the functional value of attention to independent cues about teacher motivation, learners may miss subsequent disconfirming information. Also, informal educational contexts do not guarantee high levels of student intrinsic motivation. Informal educators could counteract initial student expectancies of intrinsic interest if they were to use controlling and highly constraining teaching styles (Grolnick & Ryan, 1987). However, in the absence of differential teaching styles or additional information regarding the teacher's motivation, the current research shows that students' perceptions of teachers as constrained or autonomous are sufficient to influence intrinsic interest in learning skilled activities.

Our results also have general implications for studies of intrinsic motivation. First, this study documents the importance of studying qualitative differences in activity engagement as indicators of interest and exploration. A reliance solely on traditional quantitative measures of overall activity duration would have obscured important behavioral differences we found between constrained and unconstrained learners (see also Pittman et al., 1982). Second, this study is the first in the area of intrinsic motivation explicitly designed to demonstrate that changes in interest and exploration are affected by *indirect* extrinsic constraints. Research in this area typically studies the *direct* impact of controlling and autonomy-supporting variables on people in various social situations. That is, people are or are not constrained (e.g., by incentives, performance feedback, or activity choice) and then are assessed to determine motivational effects of the autonomy-negating or autonomy-confirming events. The present study shows that perceptions of the mere presence or absence of extrinsic constraints on others can affect the perceiver's own intrinsic interest.

## NOTES

1. Exploratory analyses including gender revealed no interactions that modified any of the treatment effects found for our measures. There was, however, a main effect of gender on rated expertness of the teacher,  $F(1, 28) = 12.42, p < .01$ ; female subjects rated the teacher as more expert ( $M = 7.98$ ) than males ( $M = 6.70$ ). Females similarly rated the teacher's desire to give the lesson higher ( $M = 8.59$ ) than male subjects ( $M = 7.96$ ),  $F(1, 28) = 4.72, p < .04$ .

2. In order to assess equivalence of actual teaching across conditions, a judge blind to conditions rated the lesson on two 9-point scales measuring adherence to the lesson script and controlling versus noncontrolling teaching style (Deci, Spiegel, Ryan, Koestner, & Kauffman, 1982). Although placement of the concealed audiorecorder under the piano near its speaker rendered some recordings of the lesson inaudible, scorable tapes for 27 of the 32 teaching sessions were obtained. The means for the script adherence measure were 8.64 for the paid

condition and 8.69 for the volunteer condition,  $t(26) = -1.34, n.s.$ , indicating very few deviations from the script. Teaching style was similarly scored on a 9-point scale, based on script deviations such as "You should try this" versus "Why don't you try this?" The means were 5.07 and 4.69 for the paid and volunteer conditions, respectively,  $t(26) = 1.02, n.s.$

3. Within-treatment correlations were computed between students' rated enjoyment of the lesson and their ratings of the teacher's motivation to teach the lesson and between students' enjoyment of piano playing and perceived teacher enjoyment of piano playing. For the volunteer teaching condition, the correlation between subjects' enjoyment of the lesson and ratings of the teacher's desire to teach the lesson was significant ( $r = .73, p < .001$ ), with a similar trend between subjects' rated enjoyment of piano playing and ratings of the teacher's enjoyment of piano playing ( $r = .37, p < .08$ ). Correlations between these measures were nonsignificant, however, within the paid teaching condition ( $r = .16$  and  $.06$ , respectively).

4. Separate qualitative analyses in all new-playing categories would result in expected values below 5 in several cells, thereby violating assumptions for chi-square analyses. Therefore, these frequencies were summed to yield a composite new-playing index.

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