

Supervisors' Beliefs and Subordinates' Intrinsic Motivation: A Behavioral Confirmation Analysis

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Numerous studies have documented that when supervisors are more supportive of autonomy and less controlling, subordinates demonstrate higher levels of intrinsic motivation. The present research examined the role of supervisors' beliefs about a subordinate's intrinsic or extrinsic motivation in explaining this relation. A teaching paradigm was used in which participants were assigned the role of supervisors or subordinates. Supervisors were given no information regarding the subordinate, told that the subordinate was extrinsically motivated, or told that the subordinate was intrinsically motivated. Results revealed that subordinates who were believed to be intrinsically motivated perceived their supervisor as being significantly more supportive of autonomy, reported significantly more intrinsic interest, and spent significantly more time on the task during the free-choice period than subordinates whose supervisors believed them to be extrinsically motivated. Theoretical implications of the behavioral confirmation process for social perception and intrinsic motivation research are discussed.

Intrinsic motivation energizes a wide variety of behaviors and psychological processes for which the primary reward is the experience of competence and autonomy (Berlyne, 1966; Deci & Ryan, 1985; Hunt, 1971; White, 1959). It is postulated that the fulfillment of these needs motivates an ongoing process of seeking situations that are interesting, that represent optimal challenges, and that require the use of creativity and resourcefulness (Deci & Ryan, 1985). Over the last 25 years, research has tried to identify the factors that could either facilitate or undermine intrinsic motivation. According to Deci and Ryan (1985, 1987), the central parameter mediating the effects of external events on intrinsic motivation is whether an individual perceives contexts as supportive of his or her autonomy (i.e., encouraging the individual to make his or her own choices) or as controlling (i.e., pressuring the individual toward a specific activity or toward particular outcomes). It has been shown that when supervisors or teachers behave in an autonomy-supportive manner (i.e., provide subordinates with options and use rewards to reflect competence) rather than a controlling manner (i.e., use threats and deadlines and use rewards to control behaviors), subordinates display high levels of intrinsic motivation (Deci, Nezlek, & Sheinman, 1981; Deci, Schwartz, Sheinman, & Ryan, 1981; Pittman, Emery, & Boggiano, 1982; Ryan, 1982).

This causal sequence linking interpersonal behaviors, intrinsic motivation, and outcomes triggers an interesting question about autonomy-supportive and controlling behaviors. Because the proposed sequence starts with supervisors' interpersonal behaviors, it is essential to consider what factors determine whether an individual in a supervising role will behave in an autonomy-supportive or controlling way with a subordinate. Studies have investigated the role of dispositional processes to better understand the determinants of such interpersonal behaviors. For example, Deci, Schwartz, et al. (1981) proposed that adults tend to have a general orientation toward dealing with others that could be viewed as ranging from being supportive of autonomy to being controlling. In two studies, Deci, Schwartz, et al. (1981) and Deci, Nezlek, and Sheinman (1981) tested a scale designed to assess adults' orientations toward controlling children versus supporting autonomy. These authors found that children in classrooms with teachers oriented toward supporting autonomy had higher intrinsic motivation and self-esteem than children in the classrooms of teachers oriented toward using control to regulate behaviors.

In a series of studies, Boggiano, Barrett, Weiher, McClelland, and Lusk (1987) proposed that these interpersonal behaviors could be related to lay theories held by adults regarding ways of optimizing intrinsic motivation. These authors examined the techniques adults perceived as being effective to maximize long-term and short-term interest for academic tasks. Adults' perceptions of four techniques (small-large reward, small-large punishment, reasoning, and noninterference) were tested. The results showed that participants believed that tangible rewards are more effective than other less controlling approaches (i.e., reasoning and noninterference) for enhancing intrinsic motivation in children and that long-term interest in academic tasks will increase with the size of a reward. Thus, lay theories of the effects of control on intrinsic motivation showed little correspondence with research evidence on this topic.

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Other studies have also assessed the role of contextual factors. For example, Deci, Spiegel, Ryan, Koestner, and Kauffman (1982) have suggested that contextual factors should affect whether supervisors create a climate that is primarily controlling or primarily oriented toward supporting autonomy. For example, when higher authorities impose restrictions or when supervisors' own autonomy is not supported, it is likely that supervisors will become controlling with a subordinate. Deci et al. verified this hypothesis in a laboratory study. They observed that impressing on supervisors that they were responsible for a subordinate performing up to high standards led them to be more critical of the subordinate and more controlling than supervisors who did not have to face such performance standards. Similar results were observed by Flink, Boggiano, and Barrett (1990) in a field experiment with teachers and students.

Two other situational determinants have been proposed by Harackiewicz and Larson (1986): whether or not supervisors are expected to use rewards to motivate subordinates and whether or not supervisors are themselves rewarded for making the subordinates' task enjoyable. As hypothesized by the authors, supervisors deemphasized their own role as an independent source of information about the subordinates' performance and were more controlling when they had to administer rewards to their subordinates. However, when supervisors were themselves rewarded for maintaining their subordinates' interest, the effect for mandatory rewards disappeared. In other words, supervisors felt more responsible for their subordinates' task enjoyment and then became less controlling.

In other studies, it has been proposed that individuals in a supervisory role may be subjected not only to pressure from higher authorities but to various pressures from subordinates. Barrow (1976) and Lowin and Craig (1968) have examined supervisors' reactions after an increase or decrease in subordinates' performance and productivity. They observed that supervisors were more supportive, kind, and considerate when subordinates were perceived as productive. When subordinates were perceived as unproductive, supervisors became more controlling and relied on punishment to motivate them.

A final source of influence that has been identified concerns supervisors' expectancies regarding their subordinates' behaviors. Merton (1957) first introduced the term *self-fulfilling prophecy* to refer to circumstances in which people's belief about something could lead them to behave in ways that cause the belief to come true even if the belief was initially incorrect. Rosenthal (1976) was among the first to document the self-fulfilling prophecy in social contexts. Snyder and his colleagues (e.g., Snyder & Swann, 1978; Snyder, Tanke, & Berscheid, 1977) and Swann and Ely (1984) proposed the term *behavioral confirmation* for self-fulfilling prophecies that are mediated by interpersonal mechanisms.

A vast amount of research has shown that supervisors' expectancies regarding subordinates' characteristics not only affect the interpersonal behavior of the supervisors but also channel social interaction so as to cause the behavior of the subordinates to confirm supervisors' initial expectancies. Although not directly related to intrinsic motivation, many of these studies have shown that when supervisors have positive expectations of their subordinates, they are more supportive (Chaiken, Sigler, & Deregale, 1974; Rist, 1970; Rubovitz & Maehr, 1973), they give

clearer and more positive feedback (Brophy & Good, 1970; Cooper, 1979; Weinstein, 1976), they pay more attention to the subordinates (Cooper & Good, 1983; Rosenthal, 1974), and they provide the subordinates with more opportunities for learning difficult subject matter (Allington, 1980; Brophy & Good, 1970).

Many of these studies also showed that supervisors' expectations predicted changes in subordinates' level of achievement. However, these studies did not detail the interpersonal and motivational processes by which supervisors' expectations translate into superior performance by subordinates. Specifically, the researchers did not consider the possibility that supervisors may believe that subordinates are motivated in different ways and that their beliefs regarding their subordinates' motivational orientation may lead them to adopt different interpersonal behaviors. Does the fact of believing that a subordinate is intrinsically interested in an activity versus engaging in the activity only because of external pressures lead supervisors to behave differently toward a subordinate? Are supervisors more likely to behave in autonomy-supportive ways when subordinates are perceived as intrinsically interested? What are the consequences of these behaviors on subordinates' motivation and performance? When one considers the consequences associated with an intrinsic or extrinsic motivational orientation, one may wonder about the fact that subordinates may or may not be motivated; one may wonder as well whether the subordinates have different motivational orientations and whether these orientations lead to different outcomes.

Mechanisms of Behavioral Confirmation

Many models have been proposed to explain the sequence of events in the behavioral confirmation process (e.g., Brophy & Good, 1974; Darley & Fazio, 1980; Jussim, 1986; Snyder, 1984). According to Snyder (1984, 1992), the process follows several steps: (a) The perceiver adopts certain beliefs about the target, (b) the perceiver behaves as if these beliefs were true and treats the target accordingly, (c) the target perceives and responds to the perceiver's behaviors, and (d) the perceiver interprets the target's behaviors as a confirmation of his or her initial beliefs. For example, in a study of stereotypes involving physical attractiveness, Snyder et al. (1977) led men to believe that they were interacting over the phone with women who were either attractive or unattractive. The results showed that men were more sociable and friendly toward women whom they believed to be attractive rather than unattractive. In turn, women provided behavioral confirmation to men's stereotypes about women's attractiveness by reciprocating the men's behaviors.

Snyder (1984) also proposed that the behavioral confirmation process could lead to further consequences for both participants. This process occurs when the target changes his or her self-perception as a result of the interaction and behaves accordingly in subsequent situations. Finally, it is possible that the confirmed beliefs may serve as a basis to evaluate the target's behaviors and influence perceptions in other social situations involving both participants (Snyder, 1981). For example, Snyder and Swann (1978) observed that targets who had offered behavioral confirmation for perceivers' beliefs about hostility and regarded their actions as personal dispositions persevered in dis-

playing hostility in their subsequent interactions with individuals who had no prior knowledge about them.

Behavioral Confirmation and Intrinsic Motivation

Extrapolating from research on behavioral confirmation processes, our goal was to examine whether a supervisor's beliefs about a subordinate's intrinsic (or extrinsic) motivation could induce the supervisor to support autonomy (or to be controlling) with the subordinate, which in turn would cause the behavior of the subordinate to confirm the supervisor's beliefs. This represents the first formal attempt to integrate two influential social psychological theories and paradigms: the cognitive evaluation theory of intrinsic motivation and behavioral confirmation theory. Figure 1 shows the theoretical sequence derived from the integration of both paradigms. We propose that when supervisors believe that subordinates are intrinsically motivated, they support subordinates' autonomy; when they believe that subordinates are extrinsically motivated, they behave in a controlling way with the subordinates. In turn, subordinates are expected to provide behavioral confirmation to supervisors' beliefs about subordinates' intrinsic (or extrinsic) motivation by becoming intrinsically or extrinsically motivated. Finally, the behavioral confirmation process leads to further consequences for both participants. For example, the confirmed beliefs serve as a basis to evaluate the subordinate's behaviors and influence perceptions in other social situations involving both participants.

Experiment 1: A Pilot Study

The pilot study had two purposes. The first was to verify that the experimental induction about the subordinates' motivation would create the expected beliefs in the supervisors. The second was to determine whether the autonomy-supportive and controlling items formulated to measure supervisors' interpersonal behaviors would allow us to discriminate supervisors' reactions after the motivational induction.

Method

Thirty undergraduate students in psychology were asked to participate in this study (M age = 21.2 years). Each student received another questionnaire supposedly completed by a subordinate, a SOMA puzzle, and examples of solutions for different configurations. The SOMA puzzles involved seven pieces that could be combined to form a variety of different shapes or configurations. The questionnaire supposedly completed by a subordinate contained eight questions designed to represent a participant's intrinsic motivation toward the SOMA puzzle (e.g., "I love to play with the SOMA puzzle, I find it challenging") and extrinsic

motivation toward the activity (e.g., "The only reason why I participate in this study is that I am being paid"). Fifteen students were led to believe that a participant had completed this questionnaire and that he was intrinsically motivated toward the task (i.e., the answers to the questionnaire indicated that the participant enjoyed working on the SOMA puzzle and that he found the puzzles interesting and challenging). Fifteen others were led to believe that the participant was extrinsically motivated (i.e., the answers to the questionnaire indicated that the participant was not interested in that type of task, thought the task was boring, and participated in the experiment only because he was to be paid \$10). Students were also asked to complete individually a small questionnaire containing five items representing autonomy-supportive behaviors and five items representing controlling behaviors. These items were formulated on the basis of Deci and Ryan's (1985) definition of autonomy-supportive and controlling behaviors. An example of an autonomy-supportive item is "To what extent would you let the subordinate decide about how to solve the puzzle?" An example of a controlling item is "To what extent do you feel it is important that you tell the subordinate exactly what to do?" These items were presented after the more general question "If you had to teach this subordinate how to solve different configurations, to what extent would you . . . ?" All items were assessed on a 9-point Likert-type scale.

Results and Discussion

Results from this pilot study indicated, first, that the autonomy-supportive and the controlling items from the interpersonal behaviors scale had an acceptable level of internal consistency (alphas of .74 and .81, respectively). Second, students who had been given the intrinsic motivation induction indicated that they would be much more autonomy supportive ($M = 31.3$) and much less controlling ($M = 19.6$), $t(29) = 4.68$, $p < .001$, than students who had been given the extrinsic motivation induction ($M = 23.1$ and $M = 27.9$, respectively), $t(29) = 3.87$, $p < .001$. (Scores for each scale could range from 5 to 45.) In sum, it seemed that the experimental induction about the subordinates' motivation created the expected beliefs in the supervisors and that the autonomy-supportive and controlling items of the interpersonal behaviors scale would allow us to discriminate supervisors' reactions after the motivational induction. Because autonomy-supportive behaviors have been shown to increase intrinsic motivation and controlling behaviors have been shown to decrease intrinsic motivation, it is possible not only that the induction of an intrinsic (or extrinsic) motivation belief would influence a supervisor's interpersonal behaviors but that the supervisor's behaviors would lead a subordinate to become more (or less) intrinsically motivated toward the task.

Experiment 2

Although supervisors in Experiment 1 indicated that they would behave differently if they had to interact with a subordi-

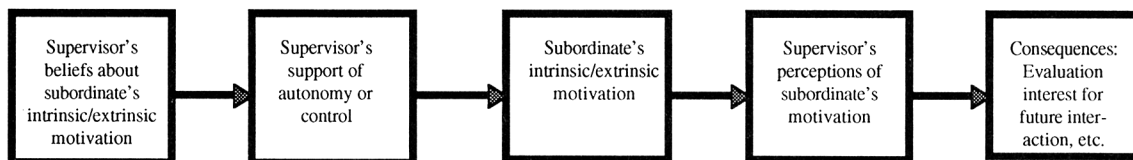


Figure 1. A model depicting the behavioral confirmation process of intrinsic and extrinsic motivation beliefs.

nate who was either intrinsically or extrinsically motivated, they did not actually have the opportunity to teach subordinates how to solve the puzzles. Such an opportunity was provided in Experiment 2, along with an assessment of subordinates' motivation. We hypothesized that a supervisor's beliefs about a subordinate's motivation would guide the interpersonal behavior adopted by the supervisor toward the subordinate, which in turn would cause the behavior of the subordinate to confirm the supervisor's beliefs. As a consequence, we also hypothesized that subordinates who showed a high level of intrinsic interest after an interaction with an autonomy-supportive supervisor would develop the perception that they were intrinsically motivated toward the target activity and would show a higher level of interest during the free-choice period. Other consequences were also expected. Specifically, we hypothesized that supervisors would evaluate more positively the performance of subordinates they believed to be intrinsically motivated. Finally, supervisors and subordinates in the condition in which beliefs of intrinsic motivation were induced were expected to report a greater desire to interact together again in the future than supervisors and subordinates in the condition in which extrinsic motivation beliefs were induced.

Method

Participants. Thirty male graduate students in psychology and physical education participated as supervisors (M age = 24.4 years), and 30 male high school students participated as subordinates (M age = 17.1 years). It was decided to use participants of different ages as supervisors and subordinates to increase the realism of the teaching situation. Participants were scheduled in pairs and were previously unacquainted. A male experimenter collected data from all pairs of participants, and participant pairs were randomly assigned to one of the three experimental conditions. Ten supervisors were given the *intrinsic motivation* induction, 10 were given the *extrinsic motivation* induction, and 10 were not given any induction. All participants received \$10 for their participation.

Procedure. As a means of ensuring that participants would not see each other before their interactions, they arrived in separate rooms. The supervisors were scheduled to arrive 30 min before the subordinates. Each supervisor was then taken to an experimental room. The experimenter informed each supervisor that he was studying educational processes occurring in social interactions. In line with the pilot study, each participant was told that he would serve as a supervisor and that he would be teaching a subordinate how to solve a spatial relations puzzle called SOMA (see Deci, 1971) for a period of 20 min. The supervisor was given the puzzle pieces, drawings of 12 different shapes, and the solutions for the 12 shapes. The supervisor was then left alone for 25 min to become familiar enough with the puzzles to be able to teach them to a subordinate. The experimenter also mentioned that he would be back in 25 min with some information on the subordinate. During that time, the participant assigned to the role of subordinate arrived at a designated meeting room. He was told that he would serve as a subordinate and that he would be learning to solve spatial relations puzzles with the help of a supervisor.

After the training period, the experimenter returned to the supervisor's room with a folder containing, ostensibly, information about the subordinate. He asked whether the supervisor had any question concerning the puzzles or the session that was going to take place. Then the experimenter gave the experimental induction. The supervisor was told that he would spend 20 min teaching a subordinate how to solve the puzzles. The subordinate would be in an adjacent room connected by

an intercom and a one-way window. At this point, the intercom was still off, and drapes were covering the one-way window. Each supervisor in the experimental conditions was presented with a false questionnaire supposedly completed by the subordinate. In the *intrinsic motivation beliefs* condition, the supervisor was told that "the answers to the questionnaire indicate that the participant (subordinate) enjoyed working on that type of task, he likes to do this type of experiment, he finds these puzzles interesting and challenging." In the *extrinsic motivation beliefs* condition, the supervisor was told that "the answers to the questionnaire indicate that the participant was not interested by that type of task, he thought the task was boring, and the only reason he was participating in the experiment was because \$10 were given to all subjects." Supervisors in the control condition did not receive any information about the subordinate's interest in the task.

A few minutes later, the subordinate arrived in the other room, accompanied by a research assistant. The experimenter opened the drapes covering the one-way window and left to get the subordinate ready for the session. The subordinate was seated at a table and given a set of the SOMA puzzle pieces and drawings of the 12 configurations without, of course, the solutions. The experimenter explained to the subordinate that he would be learning how to solve these puzzles with the help of a supervisor who was seated in an adjacent room behind the one-way window and that they would be communicating over an intercom. The experimenter asked the subordinate whether he had any questions. Then he turned on the microphone, opened the drapes in the subordinate's room, and briefly introduced both participants. It was explained that they were going to be left alone for the 20 min. After that period, the experimenter would come back and ask them to answer a few questions.

After 20 min, the experimenter returned to the supervisor's room and ended the teaching session. He also asked the subordinate, before turning off the microphone, not to leave the room, and he told him that he would be there in a few seconds. Subsequently, the supervisor was asked by a research assistant to complete a questionnaire in a different room. The experimenter returned to the subordinate's room, solved the final puzzle the participants were working on (to avoid any desire from the subordinate to complete the puzzle during the free-choice period; Deci, 1971), and mentioned that the only remaining task was to complete a questionnaire. The experimenter said that he forgot to bring with him a copy of the questionnaire and that he would get a copy of it from his office and be back in just a few minutes. Then the experimenter added casually, "If you would like to do more of the puzzles you're welcome to." The experimenter then left the room for a period of 6 min. The participant could return to the task, read magazines, or do other things. A research assistant, unaware of the hypotheses and the experimental conditions, observed the participant through the one-way window (although the drapes appeared to be closed, the experimenter always left them slightly opened). The length of time spent on the puzzles constituted the behavioral measure of intrinsic motivation. After this free-choice period, the experimenter returned with the questionnaire and asked the subordinate to complete it. Finally, both the supervisor and the subordinate were debriefed and dismissed.

Dependent measures. The supervisor and the subordinate both completed a questionnaire that assessed their perceptions about the teaching activity and about their interaction with their partner. Measures in the supervisors' questionnaire included questions used in the pilot study about their perceptions of their autonomy-supportive behaviors (five items; $\alpha = .81$) and controlling behaviors (five items; $\alpha = .77$), as well as questions about the subordinate's motivation toward the task (e.g., "The subordinate seemed to enjoy doing the puzzles"; six items; $\alpha = .86$), the subordinate's performance for the session ("On a scale ranging from 0 to 100%, how would you rate the subordinate's performance?"), and the supervisor's interest in teaching the subordinate again ("To what extent would you be interested in teaching this subordinate again?").

Measures in the subordinates' questionnaire included subordinates' perceptions of the supervisor's autonomy-supportive behaviors (5 items; $\alpha = .80$) and controlling behaviors (5 items; $\alpha = .79$). These items were adapted from the supervisors' interpersonal behavior scale. Also included were different measures of motivation. A first measure was the Mayo questionnaire (Mayo, 1976). This scale is composed of 23 items ($\alpha = .92$). The items inquire about interest in the task, task absorption, and perceptions of challenge. This scale has been used in several intrinsic motivation studies (e.g., Fisher, 1978; Mayo, 1976; Pretty & Seligman, 1984; Vallerand & Reid, 1984, 1988) and has been shown to have high levels of internal consistency (alphas of .93 [Mayo, 1976] and .95 [Pretty & Seligman, 1984]) and good construct validity (Mayo, 1976; Vallerand & Reid, 1984, 1988). A second scale assessed the experience of interest-enjoyment (e.g., "I enjoyed doing this task very much"; 5 items; $\alpha = .91$) and perceived choice (e.g., "I had some choice about doing the task"; 5 items; $\alpha = .82$). Prior research has indicated significant relations between interest-enjoyment and choice ratings and behavioral measures of intrinsic motivation (Harackiewicz, 1979; Ryan, Koestner, & Deci, 1991; Ryan, Mims, & Koestner, 1983). The behavioral measure of intrinsic motivation was the time spent on the activity during a 6-min free-choice period (e.g., Deci, 1971). Finally, subordinates were also asked to indicate their interest in interacting with the supervisor again ("To what extent would you be interested in being taught by this supervisor again?").

The communication between participants was also tape-recorded and later analyzed by objective observers unaware of the experimental hypotheses or induction. So that the judges would not be influenced by the subordinates' responses, both voices were recorded independently. The participants did know beforehand that their voices were being recorded, but they later provided written consent. Two trained judges independently rated each session using the same items from the interpersonal behavior scales. Thus, the same items were completed by the supervisors, the subordinates, and the judges, which allowed direct comparisons of perceptions about supervisors' interpersonal behaviors. The judges also assessed the number of puzzles completed during the experimental session. Interjudge reliabilities, as assessed by Pearson correlations, were .88 for the autonomy-supportive items, .85 for the controlling items, and .99 for the number of puzzles completed. All of the items for the supervisors', subordinates', and judges' questionnaires were rated on a 9-point Likert-type scale.

Results

To chart the process of behavioral confirmation of supervisors' beliefs in social interaction, we examined the effects of providing false information about the subordinate's motivation on (a) both the supervisors' and the subordinates' perceptions of the supervisors' interpersonal behaviors, (b) the subordinates' perceptions of their motivation during the teaching session and the supervisors' perception of the subordinates' motivation, and (c) the evaluation by the supervisors of the subordinates' performance, the objective performance of the subordinates, and the supervisors' and subordinates' desire to interact again together. The data from this experiment were subjected to a one-way analysis of variance (10 participants per cell) with three conditions (the intrinsic motivation beliefs condition, the extrinsic motivation beliefs condition, and the control group). When a significant effect was found, the Student Newman-Keuls test was used in comparing the means of the three groups.

Supervisors' interpersonal behaviors. Did the supervisors use different teaching behaviors after the induction of beliefs about the subordinates' motivation? To answer this question, we examined the supervisors' and the subordinates' perceptions,

as well as the judges' ratings of the supervisors' interpersonal behaviors. We expected that supervisors would be more supportive of autonomy and less controlling when they believed that a subordinate was intrinsically motivated. The means, standard deviations, and F values for perceptions of the supervisors' behaviors are shown in Table 1. Supervisors who had been led to believe that they were interacting with an intrinsically motivated subordinate perceived themselves ($M = 30.9$), and were perceived by the subordinates ($M = 30.4$) and the judges ($M = 31.3$), as supporting autonomy much more than the supervisors who had been led to believe that they were interacting with an extrinsically motivated subordinate (supervisors' perceptions, $M = 20.4$; subordinates' perceptions, $M = 24.4$; and judges' ratings, $M = 23.8$). Conversely, supervisors who had been led to believe that they were interacting with an intrinsically motivated subordinate perceived themselves ($M = 22.0$), and were perceived by the subordinates ($M = 21.1$) and the judges ($M = 17.2$), as much less controlling than the supervisors who had been led to believe that they were interacting with an extrinsically motivated subordinate (supervisors' perceptions, $M = 29.9$; subordinates' perceptions, $M = 28.5$; and judges' ratings, $M = 27.0$).¹ The control group means for both variables were between those of the two other experimental conditions. Thus, supervisors' beliefs about the motivation of their subordinates did affect their behaviors toward the subordinates in a systematic way that was confirmed by supervisors, subordinates, and independent raters. Believing that a subordinate was intrinsically motivated led to autonomy-supportive behaviors, and believing that a subordinate was extrinsically motivated led to controlling behaviors.

Subordinates' responses. We next considered whether subordinates' level of intrinsic motivation varied as a consequence of the supervisors' interpersonal behaviors. Subordinates in the intrinsic motivation beliefs condition reported higher levels of interest-enjoyment ($M = 50.4$) and perceptions of choice ($M = 35.7$), and perceived themselves as being more intrinsically motivated ($M = 144.0$) than the subordinates in the condition in which extrinsic motivation beliefs were induced (M s = 40.1, 26.6, and 110.7, respectively). As shown in Table 2, subordinates in the intrinsic motivation beliefs condition also spent more time working on the puzzle during the free-choice period ($M = 334.9$) than the subordinates in the extrinsic motivation beliefs condition ($M = 145.3$).

To assess the behavioral confirmation effect, we compared the supervisors' perceptions of their subordinates' motivation. An examination of the means displayed in Table 2 reveals that supervisors in the intrinsic motivation beliefs condition did, in fact, believe that their subordinates were more intrinsically motivated than supervisors in the extrinsic motivation beliefs condition ($M = 37.3$ and $M = 25.8$, respectively).

Consequences of the behavioral confirmation. The behav-

¹ Correlational analyses revealed that judges' ratings of autonomy support and control were significantly related to both supervisors' perceptions ($r = .37, p < .05$, and $r = .35, p < .05$, respectively) and subordinates' perceptions ($r = .49, p < .01$, and $r = .55, p < .01$, respectively). Supervisors' and subordinates' perceptions of autonomy support ($r = .41, p < .01$) and control ($r = .38, p < .05$) were also significantly related.

Table 1

Means and Standard Deviations for the Autonomy-Supportive Behaviors and the Controlling Behaviors, as Perceived by the Supervisors, the Subordinates, and the Judges, as a Function of Experimental Condition

Type of behavior	Condition						<i>F</i> (2, 27)
	Intrinsic motivation beliefs		Control group		Extrinsic motivation beliefs		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Autonomy supportive							
Supervisors' perceptions	30.9 _a	6.8	23.5 _b	9.4	20.4 _b	4.8	6.31**
Subordinates' perceptions	30.4 _a	6.7	26.0 _{a,b}	8.4	24.4 _b	9.2	3.93*
Judges' ratings	31.3 _a	7.3	28.5 _a	6.5	23.8 _b	4.1	3.38*
Controlling							
Supervisors' perceptions	22.0 _a	5.4	24.4 _{a,b}	9.0	29.9 _b	2.8	6.68**
Subordinates' perceptions	21.1 _a	5.7	24.7 _{a,b}	6.6	28.5 _b	2.1	7.14**
Judges' ratings	17.2 _a	5.7	22.7 _{a,b}	7.1	27.0 _b	6.2	6.12**

Note. Means with different subscripts differ at the .05 level of significance.

* $p < .05$. ** $p < .01$.

ioral confirmation processes had many consequences. First, as mentioned earlier, the subordinate's motivation persevered into a second situation, the free-choice period. Thus, subordinates in the intrinsic motivation beliefs condition spent more time working on the puzzle when they were left alone than subordinates in the extrinsic motivation beliefs condition.

Second, confirmed beliefs served as a basis for evaluations of the subordinates' performance. As shown in Table 3, supervisors in the intrinsic motivation beliefs condition evaluated the subordinate's performance more positively ($M = 88.0\%$) than supervisors in the extrinsic motivation beliefs condition ($M = 69.5\%$), even though, objectively, the numbers of puzzles completed by the subordinates in the different conditions were not significantly different (intrinsic motivation beliefs condition, $M = 2.7$; extrinsic motivation beliefs condition, $M = 4.9$).

Finally, supervisors in the intrinsic motivation beliefs condi-

tion ($M = 7.2$), in comparison with supervisors in the extrinsic motivation beliefs condition ($M = 4.9$), indicated that they were more interested in working again with the same subordinate. Subordinates' interest in working with the same supervisor again, although in the same direction as the supervisors' interest, was not significantly different for the three experimental conditions (intrinsic motivation beliefs condition, $M = 7.7$; extrinsic motivation beliefs condition, $M = 6.3$).

Discussion

The purpose of the present study was to test an integration of the intrinsic motivation and behavioral confirmation paradigms by ascertaining whether a supervisor's beliefs about a subordinate's motivational orientation (intrinsic or extrinsic) would set in motion interpersonal behaviors (supporting auton-

Table 2

Means and Standard Deviations of the Subordinates' Perceptions of Interest-Enjoyment, Choice, Intrinsic Motivation, and Free-Choice Time and the Supervisors' Perceptions of Subordinates' Motivation, as a Function of Experimental Condition

Measure	Condition						<i>F</i> (2, 27)
	Intrinsic motivation beliefs		Control group		Extrinsic motivation beliefs		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Subordinates' motivation							
Interest-enjoyment	50.4 _a	8.3	39.3 _b	10.7	40.1 _b	11.3	6.74**
Choice	35.7 _a	5.7	29.2 _{a,b}	7.9	26.6 _b	7.5	3.42*
Intrinsic motivation (Mayo questionnaire)	144.0 _a	31.0	113.3 _b	28.8	110.7 _b	30.2	3.80*
Free-choice time (360 s)	334.9 _a	43.4	224.1 _{a,b}	161.0	145.3 _b	127.3	6.18**
Supervisors' perceptions of subordinates' intrinsic motivation	37.3 _a	5.3	31.4 _b	4.3	25.8 _c	6.0	11.99**

Note. Means with different subscripts differ at the .05 level of significance.

* $p < .05$. ** $p < .01$.

Table 3

Means and Standard Deviations of the Subordinates' Performance, the Supervisors' Evaluation of the Subordinates' Performance, and the Supervisors' and Subordinates' Interest in Working Together Again, as a Function of Experimental Condition

Measure	Condition						<i>F</i> (2, 27)
	Intrinsic motivation beliefs		Control group		Extrinsic motivation beliefs		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Subordinates' performance	2.7	1.9	4.0	1.5	4.9	2.4	2.52
Supervisors' evaluation of the subordinates' performance (%)	88.0 _a	5.7	83.2 _a	7.9	69.5 _b	7.5	14.40***
Interest of supervisors in working with subordinates again	7.2 _a	1.2	6.4 _{a,b}	2.3	4.9 _b	2.0	3.64*
Interest of subordinates in working with supervisors again	7.7	1.4	7.0 _{a,b}	1.8	6.3	2.1	2.51

Note. Means with different subscripts differ at the .05 level of significance.

* $p < .05$. *** $p < .001$.

omy or being controlling) toward the subordinate, which in turn would cause the subordinate's behavior to confirm the supervisor's initial beliefs. In agreement with the literature on behavioral confirmation (Snyder, 1984, 1992) and self-fulfilling prophecy (Harris & Rosenthal, 1985; Rosenthal & Rubin, 1978), the present findings support such a sequence of events. Supervisors who were led to believe that a subordinate was intrinsically motivated, rather than extrinsically motivated, were more supportive of autonomy and less controlling. These differences in teaching behaviors, in turn, elicited and nurtured behaviors of the subordinate that were consistent with the supervisors' initial beliefs. Subordinates who were perceived (unknown to themselves) to be intrinsically motivated came to demonstrate more intrinsic motivation than subordinates whose supervisors believed them to be extrinsically motivated. These results support the idea that when individuals interact with others, they often use preconceived beliefs and expectations about them as guides to their interpersonal behaviors. Their interpersonal behaviors may not only prompt others to behave in ways that confirm the initial beliefs but also lead others to maintain the same behavior in a subsequent situation (e.g., free-choice period).

Supervisors also used the confirmed beliefs as a basis for evaluating the subordinates' performance. When they believed that the subordinates were intrinsically motivated, they evaluated the subordinates' performance more positively than when they believed that the subordinates were extrinsically motivated, although their objective performance was not significantly different from the performance of those in the other condition. This discrepancy between subordinates' performance and supervisors' perception of this performance may appear to be in contradiction with a behavioral confirmation explanation. However, as suggested by Deci et al. (1982), controlling supervisors may believe that offering less choice and pressuring and directing subordinates may be necessary to solve the puzzles. As a consequence, supervisors may perceive subordinates as less involved, they may take greater personal responsibility for the puzzles solved, and they may become more critical in their evaluation of a subordinate's performance.

Finally, the supervisors in the extrinsic motivation beliefs condition, as compared with those in the intrinsic motivation beliefs condition, indicated that they were less interested in interacting with the subordinate in the future. This suggests that it would be difficult for the subordinates in the extrinsic motivation beliefs condition to change the supervisors' initial beliefs in the future or to develop an interest for this specific task. Conversely, the fact that supervisors and subordinates in the intrinsic motivation beliefs condition reported being more interested in working together again may have increased the subordinates' intrinsic interest and knowledge. Together, these perceptions may reinforce the development of implicit theories or stereotypes about subordinates with different motivational orientations. These implicit theories would influence, in turn, subsequent perceptions and interactions between supervisors and subordinates.

The examination of implicit theories would appear to add an interesting dimension to Deci and Ryan's cognitive evaluation theory (1985) regarding the perception of the functional significance of supervisors' interpersonal behaviors. The overall pattern of results supports the hypothesis that individuals choose to support the autonomy of others when they want to promote or maintain interest in intrinsically motivated individuals but choose to adopt controlling strategies with extrinsically motivated individuals. Although we did not measure other interpersonal behaviors that supervisors may use in interacting with subordinates, behaviors oriented toward the support of autonomy and the control of behavior seem to represent important dimensions of people's lay theories when they are faced with individuals who could perform activities for intrinsic or extrinsic reasons. In sum, these results confirm the importance of autonomy-supportive and controlling behaviors (Deci & Ryan, 1987) as basic functional dimensions useful to an understanding of the impact of supervisors' interpersonal behaviors on subordinates' intrinsic motivation.

The present findings are in opposition to those obtained by Boggiano et al. (1987) and Barrett and Boggiano (1988). These authors proposed that adults perceived controlling strategies (rewards and punishments) as more effective techniques to

maximize long-term and short-term interest for both interesting and noninteresting academic tasks and for children who exhibited either an intrinsic or an extrinsic orientation toward learning. In the present study, supervisors who had been led to believe that they were interacting with an intrinsically motivated subordinate were much more supportive of autonomy than supervisors who had been led to believe that they were interacting with an extrinsically motivated subordinate. It is important to note, however, that Boggiano et al. (1987) and Barrett and Boggiano (1988) did not examine actual interactions between supervisors and subordinates but used hypothetical scenarios. As suggested by Swann (1984, 1987), such a research design may not provide an accurate indication of the actual interaction that could take place because the characteristics of the targets may not be as immutable and constant over time as hypothetical scenarios would suggest. It is also possible that hypothetical scenarios fail to account for dynamic interactions between supervisors and subordinates.

Although the present results revealed that the intrinsic and extrinsic motivation beliefs conditions led to different processes and outcomes for supervisors and subordinates alike, it should be pointed out that these two conditions did not differ from the control group on most of the dependent variables. However, we believe that such findings do not undermine our position because the major comparison of interest was that between the intrinsic and extrinsic motivation beliefs conditions. Only in these two conditions were beliefs induced experimentally. In fact, in most of the studies in the behavioral confirmation literature, only beliefs-induced conditions are typically used. Control groups are not used, possibly because it is difficult to create a control group in which "neutral" beliefs are experimentally induced and impossible to determine a priori the content of participants' beliefs in a true control group. Nevertheless, in line with the behavioral confirmation literature, the present results showed that the intrinsic and extrinsic motivation beliefs conditions differed significantly in the expected direction on all dependent measures. Furthermore, the means of the control group were systematically between those of the experimental conditions. Of course, it is also possible that using only 10 participants per cell may have prevented some significant effects for comparisons with the control group from emerging. In sum, the present results underscore the fact that the relative effects of experimentally induced beliefs about a subordinate's motivation appear robust, whereas the effects relative to a neutral control condition should be interpreted with caution and deserve further attention.

We see certain potential limitations to the study. One issue is the length of the interaction between the supervisors and the subordinates. In our study, the participants interacted for a period of 20 min. On one hand, it is interesting to note that the behavioral confirmation process can occur in such a short period of time. On the other hand, it is also important to consider that interactions between supervisors and subordinates usually last longer. Over a longer period, supervisors might become aware that they were wrong in their initial assumptions or subordinates might become aware of how they are being misperceived, and they can both try to correct the situation. Subordinates can also show interest for other specific tasks and eventually induce their supervisors to reconsider their initial beliefs.

A recent study by Skinner and Belmont (1993) supports this hypothesis. They examined the effects of teachers' involvement, provision of structure, and autonomy support on children's motivation and the reciprocal effects of student motivation on teachers' behaviors. They observed, using path analyses, that teachers' support of autonomy and provision of structure predicted students' motivation across the year. Their analyses also showed a reciprocal effect of student motivation on teachers' behaviors. They observed that teachers responded to students who were more engaged with higher levels of involvement and autonomy support. Thus, future research is encouraged on these issues.

Another limitation applies to the task used in the teaching session. Although participants found the SOMA puzzles interesting, they had very limited information about their level of competence at this task. As Swann and Ely (1984) have shown, when targets (e.g., subordinates) are certain of their self-views (e.g., know very well how they would do on a specific task), they can reverse the behavioral confirmation process and lead perceivers (e.g., supervisors) to change their beliefs about them. For example, students spend thousand of hours in school. It is quite probable that they can develop self-views about their motivational orientation in school and that they can become certain of these views. In such circumstances, it is then probable that students would influence teachers to behave in agreement with their own beliefs about their motivational orientation. This line of questioning deserves, in our opinion, more attention in future research.

Another limitation of this study was that we could not look more closely at the causal process implied in our integration of cognition evaluation theory and the behavioral confirmation paradigm. For example, although in the present study similar patterns of results were observed for supervisors' beliefs and subordinates' perceptions, the timing of the supervisor and subordinate questionnaire ratings (i.e., the measures were taken after the free-choice period) did not allow us to demonstrate empirically that supervisors' beliefs predict subordinates' perceptions. Future research using process analysis (e.g., see Harackiewicz, Manderlink, & Sansone, 1992; Harackiewicz, Sansone, & Manderlink, 1985), could identify which variables mediated the effects of our experimentally manipulated motivation beliefs on subordinates' intrinsic motivation.

A final limitation applies to the laboratory setting. A laboratory experiment represents a setting conducive for the occurrence of behavioral confirmation. Participants posing as supervisors do not have to deal with pressure coming from higher authorities, they do not have years of experience as supervisors or an established philosophy about interactions with subordinates, and they have to rely on the information given them about their interacting partner. In a real-life setting, it is possible that supervisors' beliefs about their subordinates' motivation may have to compete against other determinants of interpersonal behaviors. In other words, supervisors may be aware that subordinates are intrinsically motivated but still behave in a controlling manner because they have to deal with pressure from their own supervisor, because they have a different philosophy about interactions, or because they have lost interest in their job. It would then be important to verify the relative contribution of each determinant of interpersonal behaviors in a

context in which all factors could play a significant role. Interactions occurring in such domains as education, work, and sports would represent interesting opportunities to test these propositions.

In sum, our results direct attention toward a specific determinant of autonomy-supportive and controlling behaviors, namely, supervisors' beliefs about subordinates' intrinsic and extrinsic motivation. Given the significance of autonomy-supportive versus controlling behaviors for the development and maintenance of intrinsically motivated behaviors, it becomes important to understand the nature of the factors that could lead a supervisor to adopt either one of these orientations. Studies on self-fulfilling prophecies and behavioral confirmation have documented the effect of many variables on interpersonal interactions. The present findings emphasize the importance of beliefs about subordinates' motivation as a significant source of influence on supervisors' interpersonal behaviors. Indeed, this study suggests that prejudice concerning another's motivation can actually lead to self-confirming outcomes. Such self-fulfilling prophecies may appear in a wide range of supervisory contexts, including teaching, parenting, management, coaching, and directive psychotherapy.

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