The Effects of Intra-individual Goal Conflict on Performance

Edwin A. Locke  
*University of Maryland*  
Ken G. Smith  
*University of Maryland*  
Miriam Erez  
**Technion**  
Dong-Ok Chah  
*University of Maryland*  
Adam Schaffer  
*University of Maryland*

Two studies are reported on an aspect of goal setting that has not been explicitly researched to date, namely, intra-individual goal conflict. The first study utilized an experimental, laboratory design using student teams in which conflicting goals (quantity vs. quality) were assigned. The second study was a correlational, field study of college professors which measured conflict between teaching and research. In both studies conflict was negatively related to at least one performance outcome. This negative association was not mediated by goal commitment, goal priority, goal level or task strategies in either study. In both cases, the main source of the conflict was pressure.

Goal setting theory has established that specific, challenging goals lead to higher task performance than specific, unchallenging goals, vague goals or no goals, providing that: (1) there is feedback showing progress in relation to the goal; (2) appropriate task strategies are used when the task is complex; (3) individuals have adequate ability and situational constraints do not prohibit task-relevant performance; and (4) there is commitment to the goals (Locke & Latham, 1990). Goal-directed performance is also facilitated by high self-efficacy (Bandura, 1986).

Locke and Latham pointed out (pp. 145-146) as of 1990 that, although commitment to any given goal should be reduced by goal conflict, there had been no studies which focused on intra-individual conflict within the goal setting paradigm. On the other hand, inter-individual conflict has been discussed frequently in the literature (e.g., Katz & Kahn, 1968). For example, it is often...
noted that the goals of different functional departments within an organization are in conflict, as in the case of a marketing department trying to maximize sales and the finance department trying to maximize profits. Cyert and March (1963) claimed that the bargaining process by which organizations reduce goal conflict results in satisficing behaviors and suboptimal performance. Mintzberg (1983) predicted that when goal conflict arises it will be impossible to predict outcomes because of the diversity of personal and parochial goals.

More recently, Earley and Northcraft (1989) argued that goals, when properly used, as when employees with seemingly conflicting goals jointly adjust them so as to produce cooperative effort, can serve as a conflict-reduction mechanism. The bargaining literature also shows that conflicting goals can lead to effective performance if they lead to integrative agreements (e.g., Huber & Neale, 1986). However, if used improperly, goals can exacerbate conflict between individuals and work groups. A corroborating experiment by Saavedra, Earley, and Van Dyne (1993) showed that conflict between individuals was most likely to occur and to undermine performance when the type of goals and feedback given did not match the structure and demands of the task. For example, people working on a task involving pooled interdependence performed most effectively when individual goals and feedback were provided, whereas those working on reciprocally interdependent and team tasks performed most effectively when group goals and feedback were provided.

The closest previous studies have come to creating intra-individual goal conflict has been to have subjects set a personal goal and then assign them a goal that is discrepant from the personal goal, e.g., because the assigned goal is more difficult. Erez, Earley, and Hulin (1985) found that such a procedure significantly reduced commitment to the assigned goal as compared to a procedure in which personal goals were set after the goal was assigned. Latham, Erez, and Locke (1988) replicated this finding. Vance and Colella (1990) found that steadily increasing the level of the assigned goal, a procedure which made it more and more discrepant from the individual’s personal goal, led to a steady decrease in commitment to the assigned goal.

In the above studies, the goal conflict (if it existed), was unmeasured and was all in relation to the same outcome—that is, how much to produce. Although this type of goal conflict was studied in laboratory settings in the above cases, it does have its counterpart in organizational settings, as in the case where management wants workers to produce more than they think is appropriate (e.g., Coch & French, 1948).

A second and related type of intra-individual conflict involves which of a number of tasks or outcomes to emphasize when multiple goals or tasks exist, e.g., new product development, sales service, staffing, and so on. For example, Ivancevich (1974; 1976) had supervisors or technicians pursue multiple goals such as quantity, quality, service and attendance. The employees were able to achieve most or all of these goals (when there was commitment) over the 12 to 36 month time period of the studies. In laboratory settings, Erez, Gopher, and Arazi (1990) and Schmidt, Kleinbeck, and Brockman (1984) found that
when subjects were instructed to improve their performance on one of two assigned tasks, performance on the other task suffered. In the case of Erez et al., subjects were expected to attain goals on both tasks, but with different degrees of emphasis at different times. In the case of Schmidt et al., one goal was specific whereas the other was general, but they worked for both at the same time. Both studies found that the imposed conflict was dealt with through the prioritizing of one goal at the expense of the other. Kernan and Lord (1990) also found that laboratory subjects required to set goals for two different tasks often gave one task priority over the other by setting higher goals for it. However, as was the case with the single task studies described above, none of the dual task or dual goal studies actually measured experienced conflict.

While the above forms of intra-individual conflict are probably common, a third type often occurs as well. This type is between different types of goals on a single task. (e.g., “meet the quantity quota” vs. “do it right the first time”). In this case all individuals are working on the same task and the conflict is over which performance dimension to emphasize. For example, a goal to perform at a very high speed is often incompatible with a quality goal of zero defects. Thus, performance quantity and quality goals may be in conflict when there are severe time limits. Erez (1990) found a negative correlation of -.43 (p<.05) between performance quantity and quality on a computerized task involving arithmetic problems. However, goals were set for number correct (which was highly correlated with number completed) but not for quality as such in her study. The same was true of the study by Bavelas and Lee (1978). There have been no goal setting studies in which this third type of conflict was manipulated explicitly.

A related literature, that of role conflict, has more to say about intra-individual conflict and its effects. The foundation for this work was established by Lewin (1935). According to Lewin, conflict is defined psychologically “as a situation in which oppositely direct, simultaneously acting forces, of approximately equal strength, work upon the individual” (1935, p. 123). In theory, the opposition between two forces in a conflict situation leads to an increase in tension, which has negative implications for performance. (Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964).

Although role conflict and goal conflict are not identical, they are closely related. Role is the wider concept and typically refers to expected ways of acting in a given context. Goal is the narrower concept and refers to what specific outcome or end a person is trying to achieve (Locke & Latham, 1990). Goals are typically an aspect of or are inherent in roles. Thus like role conflict, goal conflict can result when incompatible goals are set for the role holder.

Implicit in the definition of Lewin (1935) is the idea that the immediate cause of intra-individual conflict is pressure exerted upon the role or goal holder to take incompatible actions or achieve incompatible outcomes. An example would be pressures on production workers to maximize both quantity and quality of performance within a limited time period or the pressure on professors to be both excellent teachers and researchers. In addition, role and goal conflicts can be totally internal, as when a person wants to attain two, partly or wholely
incompatible outcomes. Finally, intra-individual conflict can result when an external demand, which is partly or wholly accepted, conflicts with an internal or personal goal. Thus the ultimate source of intra-individual goal conflict can be pressures which are external, internal or some combination of the two (Kahn et al., 1964). Thus in both studies to be reported here, we view pressure as the immediate precursor of intra-individual goal conflict. In turn we view goal conflict, because it arouses incompatible action tendencies, as undermining performance in comparison to what would be achieved in the absence of conflict.

King and King (1990) have recently reviewed the literature on role conflict. They observed that the correlations between perceived role conflict and performance as rated by supervisors, though typically negative, were generally quite low. They also concluded that existing role conflict questionnaires assessed conflict too broadly. Among other recommendations they stressed the need in future research to construct items that accurately measure the specific type of conflict one is studying. The present study heeded this advice but with respect to goals rather than roles.

To summarize the contribution and theoretical logic of these studies: (1) theoretically, they extend the domain of goal setting theory into a new area, intra-individual conflict, which has implications for both commitment and performance; and (2) methodologically, they improve on previous work by using conflict items specific to the type of conflict involved (in line with the recommendations of King & King, 1990).

Because there was no empirical base for these studies and because established theories have little to say about goal conflict, these studies were necessarily exploratory. Our only explicit hypothesis was that goal conflict, because it entails incompatible action tendencies, would undermine performance. Role theory made it plausible to assume that incompatible pressures (e.g., from external role senders) could be a cause of role conflict. We also speculated that conflict effects might be mediated by a number of factors (e.g., commitment, prioritizing, task strategies).

The first of our two studies was designed to verify that pressure does induce intra-individual goal conflict and that this conflict does undermine performance. The second study, to be discussed in more detail below, was designed to replicate the results of the first study in a way that would maximize generalizability and to explore possible mediators of the conflict effect.

The first study was a laboratory investigation of the effects of the conflict between quantity and quality goals. Conflict was induced by two role senders assigning opposing goals. It was predicted that conflict would undermine performance, because, as noted above, it would arouse incompatible action tendencies (to the degree that time limits precluded attaining both goals in the time allowed). Thus commitment to either one of the goals should be less when accompanied by a conflicting goal than when it is not. To be more specific, an unconflicted quantity focus should lead to greater commitment to quantity and higher quantity of performance than in the case of conflicting goals. Similarly, an unconflicted quality focus should lead to higher commitment to quality and higher quality of performance than in the case of goal conflict. With
quantity as the criterion, the ordering of commitment and performance, then, should be: (1) unconflicted quantity focus; (2) quantity—quality conflict; (3) unconflicted quality focus (this latter because these subjects presumably would not be focused on quantity at all). The reverse ordering should hold with quality as the dependent variable. The logic of predicting an intermediate performance level for the conflict groups is that when quantity is the criterion, some quantity focus is better than none (as in the case of an unconflicted quality focus). Similarly, with a quality criterion, some quality focus is better than none (as in an unconflicted quantity focus).

We created a bogus business owner and supervisor in order to induce conflict in order to replicate a common experience of employees in real work settings, viz. management says one thing (e.g., we are committed to quality) and the immediate supervisor says another (e.g., we have to get this order out in time). The subordinate, in consequence, experiences conflict about the real goals of the organization. We did not make any predictions about which level of management would be more influential. The higher power position of the top manager is offset by the fact that the immediate supervisor is in face-to-face, daily contact with the employee. Thus the two conflicting pressures could cancel one another out. However, we counter-balanced goal type and managerial level just in case it did make a difference. We chose quantity and quality as the two goal types because these are major issues today, especially in manufacturing. Thus with respect to both role or goal senders and goal type, we believe that this present study has reasonable external validity.

STUDY 1

Method

Task. The task involved the group production of models for a fictitious art products company. The models were composed of a complex combination of Tinkertoy parts, wooden blocks, cardboard, craft sticks, pipe cleaners, styrofoam balls, aluminum foil, thread, macaroni, and popcorn kernels. All of the materials required to produce the model were laid out on a desk in front of the subjects.

Subjects. The subjects were 132 undergraduate students from various management and personnel classes. Extra course credit was given for participation. The subjects were divided into 44 groups of three people each. In each group there were either two males and one female or one male and two females.

Design. The design was a 2 X 2 factorial design: President Quality or Quantity emphasis vs. Supervisor Quality or Quantity emphasis.

In the President Quantity/Supervisor Quantity condition, subjects were asked, through the president’s letter and the experimenter’s (acting as a supervisor) directions, to achieve the quantity goal of twelve completed objects in the two fifteen-minute work periods combined.
In the President Quality/Supervisor Quality condition, subjects were asked to concentrate on producing only high quality products.

In the President Quantity/Supervisor Quality condition, subjects were given conflicting goals. Through the president’s letter, subjects were asked to focus on achieving the quantity goal, whereas the experimenter-supervisor stressed high quality.

In the President Quality/Supervisor Quantity condition, the president’s letter emphasized the production of only high quality products whereas the experimenter-supervisor asked subjects to focus on the quantity goal.

Procedure. Subjects were asked to sign a consent form in order to participate in the experiment. They were told that the purpose of the experiment was to determine the efficiency with which a new, low cost art object could be produced. A picture of the object was handed out to each group and the task was explained as follows:

This is the object you will be producing. You can keep this picture as a guide. All the parts and materials your group will need to produce the object are on the table in front of you. It is completely up to you to determine how the work will be organized (e.g., assembly line, sub-assembly line, each person doing a whole piece, etc.). One hint that may be of help: craft sticks need to be glued together and the macaroni and popcorn glued onto them. [The glue dried in about one minute.]

Just prior to the beginning of the practice session, the quality criteria were given to the groups. They were told that for a model to meet the quality criterion, it would need to satisfy at least ten of twelve written quality standards (e.g., “Are craft sticks glued neat and clean?”). After the practice session in which each group was instructed to complete one model in as short as time as possible, the models were evaluated. Feedback was provided to each group with respect to how many quality criteria items out of the twelve had been satisfied.

Depending on the group that was to be run, an appropriate letter was handed out to each group. This letter, written on a fictitious letterhead, was from the president of the fictitious company running the experiment. In the President Quantity/Supervisor Quantity condition, subjects were given the following letter:

Dear Students,

My name is Peter J. McCloskey. I have just founded a new company called Children’s Art, Inc. My goal is to make low cost art work for infants and toddlers (ages 1 to 3). This art work is designed to stimulate the senses through complex combinations of shapes and colors.

The art is visual only. It is not to be touched or played with. We may choose to make these art works ourselves and sell them fully assembled
or to sell the parts and have parents assemble them (at lower cost). Later we may sell kits to older kids so they can create their own.

We plan to market the product locally at first and then regionally, perhaps through craft stores.

Thus far we are experimenting with only one piece of art work. We want to know how easy it is to make, how long it takes, how fast people can learn to make them, how they will look, etc.

But let me make one thing clear. No matter what price we sell at, I am going to absolutely insist that we meet all promised delivery schedules.

I had a previous business that failed because shipments were constantly late and customers finally found another supplier. Thus, I will not accept the failure to fulfill a promised order on time.

Tonight I would like you to get a specific number completed, because I have promised them to the owner of a chain of craft shops. Tonight we need to complete six units in each fifteen minute session, or twelve units in total.

Of course, I want quality too, so I have made a check-list of 12 quality criteria for the first piece of art work. This check-list is attached. So do the best you can on quality, but remember: we will never deliver late.

Sincerely,
Peter J. McCloskey
President

After the groups read the letter, a performance contract was given to each member. This contract was signed by the subjects as a promise to do what the letter specified (in this case reach the quantity goal). The letter specified the goal level whereas the contract was intended to generate commitment to it. Once the contracts were signed, one of the experimenters, acting as the supervisor, told subjects the following:

I know that the president wants to get the promised quota of objects completed. I promised the president that we would get twelve objects done in the fifteen minute periods tonight. I intend to keep my promise so please be sure you get twelve done. That means you should try to finish six objects in the first period and six objects in the second period.

In the President Quality/Supervisor Quality condition, the first half of the letter given to the groups was the same as in the Quantity/Quantity condition. The second half was as follows:

But let me make one thing clear. No matter what price we sell at, I absolutely insist on high quality workmanship. I had a previous business that failed because we let quality slip too much. If we have learned one thing from the Japanese,
it is that quality sells. Thus, I will not allow the sale of anything but top quality work.

In order to insure quality, I have made a check list of twelve quality criteria for this first piece of art-work. The checklist is attached. You can see that if you meet every one of these criteria, the quality score would be 12. It is absolutely essential that on every piece you get a score of at least 10 out of a possible 12 quality points. There will be an inspector there tonight to score each piece on quality. So follow the Japanese maxim: *do it right the first time!*

Of course, quantity is important too. We want to complete a reasonable number or pieces in the time we have. So do as many as you can tonight, but remember, quality counts!

Again, subjects signed a contract agreeing to work for quality. For this condition, the experimenter, acting as supervisor, told subjects the following:

> I know the president wants only high quality products. I promised the President that we would do only high quality work tonight. I intend to keep my promise so I do not want to see any objects with a quality score lower than 10 out of a possible 12. Please be sure to do only high quality work.

In the President Quantity/Supervisor Quality condition, subjects were given the same letter as those in the Quantity/Quantity condition. The experimenter, acting as supervisor, told subjects the following:

> I know the President wants to get the promised quota of objects completed and I support that, but I promised the president that we would only do high quality work tonight. I intend to keep my promise so I do not want to see any objects with a quality score lower than 10 out of a possible 12. Please be sure you do only high quality work.

In the President Quality/Supervisor Quantity condition, subjects were given the same letter as those in the Quality/Quality condition. The experimenter, acting as supervisor, told subjects the following:

> I know the President wants high quality and I support that, but I promised the President that we would get twelve objects done in the two fifteen minute periods tonight. I intend to keep my promise so please be sure you get twelve done. That means you should try to finish six objects in the first fifteen minute period and six objects in the second fifteen minute period.

As noted, after the supervisor's instructions there was a practice period during which each group completed one model. The first work period then began. After ten minutes and at the end of the first (15 minute) work period, all completed models were moved to a separate table to be evaluated. The
models were evaluated by student judges who were not in the groups and were blind to the purpose of the experiment. The judges were given training prior to the practice session on how to properly evaluate the models based on the 12 specific, quality criteria. After the judges finished evaluating the models, the experimenter also checked to see that the models had been evaluated properly by checking each model against its quality criteria form completed by the evaluators. If there was a discrepancy between the evaluator and the experimenter, a decision was based upon the consensus of the two opinions. The number of discrepancies was seventeen out of a possible 425; thus the percent agreement was 96 percent. After 10 minutes subjects were told to stop working briefly (for about 5 minutes) and were given feedback with respect to both the quality and quality of work achieved thus far. This was also done at the end of the 15 minute period. The experimenter, acting as supervisor, then reiterated whatever goal had not been attained. If neither goal was attained, the experimenter reiterated both goals. The subjects were also reminded of the letter that they had read and of the performance agreement that they had signed.

At the end of a ten minute break, the second work period was begun. After 10 minutes there was a work pause and the supervisor gave each group feedback as in the first period. At the end of the second work period, the completed models were evaluated and final feedback was given to each of the groups as to how many of the completed objects had been completed and passed the quality criteria.

**Measures.**

*Productivity.* The number of completed models each group produced during the two work periods were counted and added together. Partially completed models were not counted.

*Quality.* The number of models that satisfied at least 10 out of 12 items in the quality criteria were counted and added together. The quality score was the number of models which passed the quality criteria divided by the total number of models completed.

*Attitudes.* Subjects were administered two questionnaires twice each: one before and one after each of the two work periods. All items were measured on 5 point Likert Scales. The first questionnaire basically contained manipulation check items including questions about the subjects' commitment to goals (quantity and/or quality) and their degree of perceived goal conflict. [The usual goal commitment items, described in Locke & Latham, 1990, were not used here because the focus was on quantity vs. quality emphasis rather than specific numbers. Asking subjects if they were committed to the goal of 12 units would not reveal if they were focusing more on quantity than quality; nor would it reveal experienced conflict.] This questionnaire was administered after the experimental manipulations had been made, but before the first 15 minute work period. It was administered again before the second 15 minute work period. The factor structure of this questionnaire (replicated in both administrations using principal component analysis and varimax rotation)
revealed three factors: commitment to maximize quantity, commitment to maximize quality, and goal conflict.

The second questionnaire was administered after the first 15 minute work period and again after the second. It included additional items regarding commitment to quantity and quality and regarding conflict. Since these items were highly correlated with their corresponding factors in the first questionnaire, index scores were computed for each of the three indexes (as described above) by combining items from administrations of both questionnaires. In addition, because there were no significant differences for each of the three indexes across the two administrations of each questionnaire (Commitment to Quantity: $t = -.92, df = 43, p = .36$; Commitment to Quality: $t = 1.57, df = 43, p = .12$; Conflict: $t = .75, df = 43, p = .46$), the indexes were collapsed across time. The resultant indexes were: Commitment to Quantity (6 items; e.g., “To what degree will your group try to maximize quantity?” alpha = .83); Commitment to Quality (8 items; e.g., “To what degree will your group try to maximize quality?” alpha = .84); and Conflict (10 items: e.g., “To what degree do you feel in conflict as to whether to emphasize quality or quantity?”, alpha = .82).

Results

All analyses in this section are based on group level data. For all the attitude variables, the variance between groups was significantly greater than the variance within groups (Commitment to quantity: $F = 5.46, p < .001$; Commitment to quality: $F = 5.03, p < .001$; Conflict: $F = 7.54, p < .001$); all df's = 43,88). Thus, responses to questionnaire items were averaged across group members to create group scores. Although the design of the study was 2x2, a 2x2 ANOVA would not be an appropriate test of the conflict effect. If the 2x2 table revealed that the highest quantity of output was for the quantity-quantity cell, the lowest for the quality-quality cell and each conflict cell was exactly halfway between the other two, an ANOVA would yield a main effect for President Quantity, a main effect for Supervisor Quantity and no interaction. Such an analysis would completely obscure the conflict effect. Thus we analyzed the results in terms of a 1x3 model, viz. unconflicted quantity, conflict, and unconflicted quality. The fact that in no case did the two conflict groups differ significantly on any measure (see below) further justifies combining them into a single data set.

Manipulation checks. These results are shown in Table 1. As noted, in no case was there any significant difference between the two conflict groups, thus they were combined in all subsequent analyses: (1) Commitment to Quantity. On the commitment to maximize quantity factor, there were significant differences among the groups ($F = 14.98; df = 2, 41; p < .001$). Multiple comparison tests revealed that the quantity-quantity and the combined conflict groups were significantly more committed to quantity than the quality-quality group; (2) Commitment to Quality. On the commitment to maximize quality factor the groups again showed significant differences ($F = 17.22; df = 2, 41; p < .001$). Multiple comparison tests revealed that the quality-quality and the combined conflict groups were significantly more committed to quality.
### Table 1. Manipulation checks (Study 1)

<table>
<thead>
<tr>
<th></th>
<th>Commitment to Quantity (6 items)</th>
<th>Commitment to Quality (8 items)</th>
<th>Conflict (10 items)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Quantity/Quantity</strong>&lt;br&gt;(N=11)</td>
<td>4.20(^a)(.56)</td>
<td>5.15(^a)(.93)</td>
<td>2.52(^a)(.56)</td>
</tr>
<tr>
<td></td>
<td>Quantity/Quality&lt;br&gt;(N=11)</td>
<td>3.81(.34)</td>
<td>6.32(.37)</td>
</tr>
<tr>
<td></td>
<td>3.86(^a)(.34)</td>
<td>6.15(.62)</td>
<td>3.49(.54)</td>
</tr>
<tr>
<td><strong>2. Conflict</strong>&lt;br&gt;(N=11)</td>
<td>3.90(.34)</td>
<td>6.15(.62)</td>
<td>3.49(.54)</td>
</tr>
<tr>
<td><strong>Quality/Quantity</strong>&lt;br&gt;(N=11)</td>
<td>3.86(^a)(.34)</td>
<td>6.15(.62)</td>
<td>3.49(.54)</td>
</tr>
<tr>
<td><strong>3. Quality</strong>&lt;br&gt;(N=11)</td>
<td>2.89(^b)(.94)</td>
<td>6.57(^b)(.31)</td>
<td>2.74(^b)(.77)</td>
</tr>
<tr>
<td><strong>4. Total</strong></td>
<td>3.70(.76)</td>
<td>6.05(.80)</td>
<td>3.10(.77)</td>
</tr>
</tbody>
</table>

\(F=14.98(2.41)\)<br>\(P < .001\)<br>\(F=17.22\)<br>\(P < .001\)<br>\(F=12.37\)<br>\(P < .001\)

**Notes:**

- \(^a\)\(^b\)\(^c\) Means having different superscripts in columns are significantly different.
- All comparisons with conflict groups were based on the combined groups.
- The mean of the Commitment to Quality index was higher than 5 because one component item asked subjects how many of the 12 quality criteria (see note 2) they intended to satisfy.
than the quantity-quantity group; (3) Conflict. With respect to the degree of experienced conflict, the overall F was also significant \( (F = 12.37; \ df = 2, 41; \ p < .001) \). Multiple comparison tests disclosed that both the quantity-quantity and quality-quality groups experienced significantly less conflict than the combined conflict groups.

In sum, it can be concluded that the experimental manipulations were successful in inducing a quantity orientation in the quantity-quantity groups, a quality orientation in the quality-quality groups and an intermediate or conflicted orientation in the quality-quantity groups. As noted, the results showed no significant differences in attitudes between the two conflict groups (i.e., quality goal from CEO, quantity goal from supervisor and vice versa). *Performance.* As mentioned earlier, two measures of performance were used: (1) *quantity*: total number of objects produced; and (2) *quality*: ratio of objects produced which passed inspection to total number produced. The correlation across the groups between the two measures was \( (r = -.35; \ p < .01; \) see note 4).

(1) *Analysis by group means.* The performance means are shown in Table 2. The ordering is as predicted although the differences are not all significant. The unconflicted quantity groups showed the highest quantity of performance, the unconflicted quality groups the lowest quantity of performance with the conflicted groups in between. The overall \( F(2,41) = 5.79, \ p < .01 \). It can be seen that the mean productivity of the President quantity supervisor-quality group was higher than that of its reverse, but this difference was not significant. Multiple comparison tests revealed that the quantity groups outproduced both the quality groups and the conflict groups.

With respect to performance quality, the pattern was opposite to that for quantity. The overall \( F \) was significant \([ F, (2,41) = 10.62; \ p < .001] \). Multiple comparison tests showed that the quantity groups performed lower quality work

<table>
<thead>
<tr>
<th>Groups</th>
<th>( N )</th>
<th>Quantity</th>
<th>Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity-Quantity</td>
<td>11</td>
<td>10.55(^a) (1.80)</td>
<td>.55(^b) (0.32)</td>
</tr>
<tr>
<td>Conflict</td>
<td>22</td>
<td>8.18(^a) (2.10)</td>
<td>.84(^b) (0.17)</td>
</tr>
<tr>
<td>Quality-Quality</td>
<td>11</td>
<td>7.82(^a) (2.40)</td>
<td>.95(^b) (0.07)</td>
</tr>
</tbody>
</table>

Notes: \(^a\) N is for groups; each group had 3 members
\(^b\) Total number of objects produced
\(^c\) Total number of objects produced that passed inspection divided by total number produced
\(^d\) Similar superscripts in each column are not significantly different
\(^e\) President quantity-supervisor quality
\(^f\) President quality-supervisor quality
Table 3. Correlations Among Key Variables* (Study 1)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>Cqnt</th>
<th>Cqlt</th>
<th>Con</th>
<th>Qnt</th>
<th>Qlt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition^b,c</td>
<td>2.0</td>
<td>.72</td>
<td>-2.2**</td>
<td>.63***</td>
<td>.10c</td>
<td>-42**</td>
<td>.56***</td>
</tr>
<tr>
<td>Commitment to Quantity (Cqnt)</td>
<td>3.70</td>
<td>.76</td>
<td>—</td>
<td>-40**</td>
<td>.09</td>
<td>.28*</td>
<td>-40**</td>
</tr>
<tr>
<td>Commitment to Quality (Cqlt)</td>
<td>6.05</td>
<td>.80</td>
<td>—</td>
<td>.39**</td>
<td>-24</td>
<td>.59**</td>
<td></td>
</tr>
<tr>
<td>Conflict (Con)</td>
<td>3.10</td>
<td>.77</td>
<td>—</td>
<td>-.38**</td>
<td>.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production Quantity (Qnt)</td>
<td>8.68</td>
<td>2.34</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>-.35**</td>
<td></td>
</tr>
<tr>
<td>Production Quality (Qlt)</td>
<td>.80</td>
<td>.26</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

Notes:  
+ p < .10  
* p < .05  
** p < .01  
^ n = 44 groups  
^ Coded 1 = Quantity-Quantity  
2 = Conflict  
3 = Quality-Quality  
The correlations of this variable with commitment to quality and quantity are, of course,  
the confirmation of the manipulation checks for the quantity and quality conditions shown  
in Table 1.  
^ If the experimental conditions are re-coded with conflict=2 and the remaining conditions=1, the  
resulting correlation with conflict is .63 (p < .001). This is the confirmation of the conflict  
manipulation check shown in Table 1.

than both the quality groups and the conflicted groups. The differences between  
the conflict and quality groups was in the predicted direction but not significant  
(p < .20).

(2) Regression analyses. Since there were differences among groups  
within the same condition on all the measures, it was believed that a more precise  
analysis of the attitude effects could be accomplished through regression  
analyses.

The correlations among the three attitudinal, the two performance  
variables and the experimental conditions are shown in Table 3. Aside from  
the obvious effects of experimental conditions, commitment to quantity(+) and  
conflict(-), were significantly related to quantity of output, while commitment  
to quality(+), commitment to quantity(-), and quantity of production(-) were  
significantly related to performance quality. Regression results are reported in  
Table 4. For the quantity outcome, experimental condition and conflict yielded  
significant direct effects. In a mediated regression analysis (not shown)  
commitment to quantity partially mediated the effects of experimental condition  
on performance, but conflict showed no mediation effect. With respect to  
quality, only commitment to quality showed a significant direct effect. Mediated
Table 4. Regression Results for Performance
(Study 1)

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Quantity</th>
<th></th>
<th>Quality</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β</td>
<td>t</td>
<td>β</td>
<td>t</td>
</tr>
<tr>
<td>1. Condition*</td>
<td>-.45*</td>
<td>2.3</td>
<td>.25</td>
<td>1.35</td>
</tr>
<tr>
<td>2. Commitment to Quantity</td>
<td>.16</td>
<td>.97</td>
<td>-.10</td>
<td>-.60</td>
</tr>
<tr>
<td>3. Commitment to Quality</td>
<td>.29**</td>
<td>1.57</td>
<td>.39*</td>
<td>2.19</td>
</tr>
<tr>
<td>4. Conflict (Intercept)</td>
<td>-.46**</td>
<td>-3.11</td>
<td>.01</td>
<td>.07</td>
</tr>
<tr>
<td></td>
<td>8.95*</td>
<td></td>
<td>-.02</td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>.34</td>
<td></td>
<td>.41</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>5.02**</td>
<td></td>
<td>6.72***</td>
<td></td>
</tr>
</tbody>
</table>

Notes: * Coded 1 = Quantity-Quantity
       2 = Conflict
       3 = Quality-Quality

* p < .05
** p < .01
*** p < .001

A regression analysis (not shown) revealed that commitment to quality completely mediated the effect of experimental condition on quality of performance.

**Discussion**

This experiment was successful in generating intra-individual goal conflict through external pressure. Experienced conflict, in turn, was negatively associated with quantity of production. It is interesting to note that goal conflict was positively associated with commitment to quality ($r = .39$, $p < .01$; Table 3), but unrelated to commitment to quantity ($r = .09$, ns). This and Table 2 suggest that our goal conflict manipulation succeeded in bringing a quality focus to the quantity manipulation better than it succeeded in bringing a quantity focus to the quality manipulation. This is also suggested by Table 2 which shows the performance of the conflict groups to be more like that of the quality than the quantity groups. The reason for these results may be that people (at least in the U.S.) are used to thinking of performance in terms of quantity so that urging them to pursue quality is, by contrast, a powerful, attention-getting and conflict-inducing (toward quality) intervention. This effect may have been intensified by the compressed time frame of the experiment.

It may seem puzzling that commitment to quantity and conflict were not significantly associated ($r = .09$, ns, Table 3). However, this is because the relationship is curvilinear, and thus is not revealed by the Pearson $r$. When commitment to quantity is either high or low, conflict is low; when commitment to quantity is moderate, however, conflict is high. This relationship is shown in Figure 1. The quadratic term is significant [$F(2,41) = 6.60; p < .01$]. It might be argued that this curvilinear relationship is spurious; however, logically it is possible to be committed to both quantity and quality which would lead to high commitment to quantity and quality being associated with high conflict. Further, moderate commitment to quantity could be associated with moderate
indifference and thus lead to low conflict. The design of the present study, of course, encouraged a negative association between the two types of commitment. No other curvilinear relationships were found in the data except that between experimental condition and conflict (which is clearly shown in Table 1).

The overall results indicate that although goal conflict lowers productivity, in terms of total work accomplished, there may be a net gain in quality output to the degree that a quality emphasis serves to eliminate shoddy workmanship. If one multiplies the two columns of Table 2 (quantity times percent passing inspection), the product is highest for the unconflicted quality condition (7.43) and lowest for the unconflicted quantity condition (5.80) with the conflict product being intermediate (6.87).

STUDY 2

Our first experiment indicated that conflict does undermine at least quantity of performance. The purpose of the second study was two-fold. First, we wanted to determine the generalizability of the results of the first study. Thus instead of using a laboratory setting with students working in groups on a moderately simple task covering a short time-span with goal level controlled, we used, in the second study, a field setting using adults working as individuals on complex tasks over a long time period with varying goal levels. In the second
study, we also varied the type of goal conflict involved; in the first study the goal conflict was between two dimensions of the same task. Here it was between two different tasks. If significant effects of pressure on goal conflict and goal conflict on performance were obtained in such radically different contexts, the combined findings could be considered more generalizable (Jick, 1979), and it would support the belief that goal conflict was a concept worthy of attention and further study.

An appropriate setting for this study is a university. President Bok (1990, p. 48) in his address to Harvard’s Board of Overseers noted that “no aspect of university education has provoked more complaints than the faculty’s preoccupation with research at the expense of teaching.” Despite the clear hierarchy implied here, it is well known that even faculty from publish-or-perish institutions may suffer from conflicts between the demands of research productivity and the demands of teaching. Conflicting pressures to pursue these two outcomes from Deans, department chairs, students and one’s own values and preferences are all too common in academia. In this study we measured experienced pressure rather than inducing it.

The second purpose of Study 2 was to examine other possible causes (besides pressure) of and possible mediators of the goal conflict effect. We hypothesized that pressure would affect goal conflict directly based on the results of the first study. We also reasoned that pressure might affect conflict through its effect on prioritizing. We believed that goal conflict would be maximized when the goals in question were perceived as equal in priority, thus making it difficult for the actor to allocate time and effort to one at the expense of the other. Given that Erez et al. (1990) and Schmidt et al. (1984) found that people dealt with dual task demands by prioritizing, we inferred that goal conflict would be associated with difficulty in or lack of prioritizing (i.e., seeing the goals as equal rather than unequal in priority). With respect to mediators of the goal conflict effect, the first study revealed that commitment was not a mediator of the effect of conflict on performance. We thus hypothesized that goal conflict might undermine performance in two other ways: (1) by inducing people to set lower goals (when goals were self set) than would be the case where there was no goal conflict; and (2) inducing people to develop poorer strategies for attaining the goals than would be the case without goal conflict.

Method

Tasks. The tasks involved two of the three main tasks of university professors, teaching and research. Service was dealt with briefly in the questionnaire but revealed no findings of interest and thus is not discussed further.

Subjects. The subjects were 274 professors (all levels) from 53 academic departments of the university. 1403 questionnaires were actually distributed; the return rate was therefore 20 percent, a fairly typical rate for studies of faculty (e.g., Locke, Fitzpatrick, & White, 1983). Chi-square test revealed no response bias in terms of faculty rank ($X^2 = .06; p = .97$).
Measures. The questionnaire sent to each faculty member included questions about gender, tenure, rank, tenure at rank, salary, age, experienced conflict, priorities, pressure, goals, teaching and research strategies and teaching and research performance. The indices used in the final analysis are as follows: (1) Research Pressure—e.g., To what degree do you feel external [from others] pressure to emphasize research over teaching? To what degree do you feel internal pressure to emphasize research over teaching? [The other two items were phrased in the opposite direction]; 4 items, alpha = .63; (2) Research-Teaching Priority—I have my priorities very clear. In a typical year, I spend the bulk of my time and effort on research [teaching] and do the best I can with respect to teaching [research] and service; 2 items; alpha = .59; (3) Conflict—how much conflict do you feel between the desire to be a good teacher...and the desire to be a good researcher/scholar; 2 items; alpha = .75; (4) Research Goals—goals per year for a number of research outputs were asked for (e.g., journal articles, proceedings, textbooks, edited books, research books, popular books), but most had very low means except for articles in good quality academic journals and articles published in national proceedings. We used the number of articles in good academic journals as the best “core” measure of research goals, although the results using all the goal items combined were highly similar. In our initial analysis non-responses to the article goal item were replaced with mean substitution in order not to reduce the N (since 74 subjects gave a non-response). This procedure (as compared to deleting these subjects) actually decreased the r between goals and performance (from r = .54 to r = .48 p < .01) but in both cases the r was highly significant (p < .001). The results for both N’s are reported below; (5) Research Performance—self-reported publications (including in press articles) in good quality academic journals was used as the performance measure for research, since it most closely corresponded with the research goal measure. The self-report period was 1983 to the present. Only those at the university during this period were included. The results using a more inclusive performance measure, as noted above, were highly similar. Taylor, Locke, Lee, and Gist (1984) found in a previous study of faculty members that self-report measures of productivity were highly accurate when compared to data obtained from actual VITA’s; (6) Research Strategies—a list of 39 strategies for attaining research or teaching goals was compiled from the personal experiences of the authors and those of colleagues. Factor analysis revealed that there were sub-factors in the scale and that some sub-factors were significantly related to research performance while others were not. The sum of the 13 items (alpha = .85) in the factors with the highest validity coefficients correlated .39 (p < .001) with research performance. The corresponding correlation for the full 39-item scale (alpha = .83) was .26 (p < .001). Both scales were used in the regression. (7) Teaching Goals. This measure involved indicating what teacher percentile ratings (on a scale) the professor strived for relative to other teachers over the last 6 years; (8) Teaching Performance—the self-reported teaching performance measure was composed of 4 items: undergraduate and graduate teaching performance relative to other teachers.
(percentile); average undergraduate and graduate teacher ratings on 1.0 to 5.0 university scale; alpha = .75.

Non-responses to items other than the research goal item (very few cases) were also replaced with the sample mean so that all the r’s would be based on the same N. (The individual correlations obtained using pair-wise deletion were very similar; thus using sample means to replace missing data did not distort the results).

Results

The correlations from Study 2 are shown in Table 5. Tenure at rank and salary were omitted as they co-varied strongly with age and rank, respectively. Research performance was significantly associated with: rank(+), research pressure(-), research priority(+), goal conflict(-), research goals(+), and research strategies(+). Teaching performance was significantly associated with: gender(+), (being female), rank(-), teaching priority(+), (priority was a bi-polar variable), research goals(-), teaching goals(+), and research strategies(-).

Since many of the predictor variables were interrelated, it was believed that a more precise testing of relationships could be accomplished through regression analyses. Table 6 reveals the results of the regression analysis with research performance as the dependent variable. Demographic variables were entered as controls. As can be observed in Table 6, rank (Beta = .31; p < .001), research goal (Beta = .38; p < .001), research strategy (Beta = .22; p < .001), and goal conflict (Beta = -.14; p < .05) showed significant relationships with research performance. As in Study 1, conflict was negatively related to performance.

The regression was repeated using all 39 of the strategy items (so that we were not observing possible chance relationships without cross-validation). The beta for strategies remained significant (p < .01) although it was lower than for the 13-item scale (.14 vs .22). We repeated the regression again using only those subjects who answered the research goal item (N = 200). The beta for the goal effect remained significant (p < .001) and was slightly higher than for the filled data (.41 vs .38). The main effect for goal conflict remained significant in all analyses.

Table 5 (correlation matrix) also reveals that experienced pressure was significantly related to setting research as a priority and to experienced goal conflict. Pressure, however, was not related to research performance but was associated with research priority which in turn was related to goals and strategies.

With regard to teaching performance, the results reported in Table 6 reveal that the best predictor is teaching goals (Beta = .43; p < .001). Teaching performance is also related to research strategies (Beta = .13; p < .05) and being female (Beta = .15; p < .001). We tested for mediation effects by hierarchical regression. Entering goal conflict before research goals and strategies did not lead to different results than entering it after those same variables. Thus the conflict effect was not mediated. The effect of priorities on research performance was completely mediated by goals and strategies, although this finding is not of central relevance to the goal conflict issue.
<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sex&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.19</td>
<td>0.39</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Age</td>
<td>46.58</td>
<td>10.36</td>
<td>-11&lt;sup&gt;*&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Rank&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2.21</td>
<td>0.85</td>
<td>-23&lt;sup&gt;***&lt;/sup&gt;</td>
<td>62&lt;sup&gt;***&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Perceived Research Pressure</td>
<td>3.32</td>
<td>0.90</td>
<td>0.15&lt;sup&gt;**&lt;/sup&gt;</td>
<td>-25&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-27&lt;sup&gt;***&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Priorities&lt;sup&gt;c&lt;/sup&gt;</td>
<td>3.34</td>
<td>1.04</td>
<td>-16&lt;sup&gt;**&lt;/sup&gt;</td>
<td>-35&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-0.9&lt;sup&gt;†&lt;/sup&gt;</td>
<td>0.17&lt;sup&gt;**&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Conflict</td>
<td>3.34</td>
<td>1.00</td>
<td>0.22&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-14&lt;sup&gt;**&lt;/sup&gt;</td>
<td>-25&lt;sup&gt;***&lt;/sup&gt;</td>
<td>0.39&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-12&lt;sup&gt;*&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Research Goal&lt;sup&gt;d&lt;/sup&gt;</td>
<td>2.11</td>
<td>1.08</td>
<td>-0.07</td>
<td>-14&lt;sup&gt;**&lt;/sup&gt;</td>
<td>-0.01</td>
<td>-0.04</td>
<td>0.23&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-0.06</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Teaching Goal</td>
<td>4.14</td>
<td>0.53</td>
<td>0.07</td>
<td>0.16&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-0.00</td>
<td>-0.18&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-0.26&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-0.07</td>
<td>0.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Strategies</td>
<td>2.78</td>
<td>0.69</td>
<td>-14&lt;sup&gt;**&lt;/sup&gt;</td>
<td>-24&lt;sup&gt;***&lt;/sup&gt;</td>
<td>0.02</td>
<td>0.05</td>
<td>0.30&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-0.05</td>
<td>0.30&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-10&lt;sup&gt;**&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Research Performance</td>
<td>10.83</td>
<td>12.07</td>
<td>-0.07</td>
<td>0.00</td>
<td>0.28&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-0.10&lt;sup&gt;†&lt;/sup&gt;</td>
<td>0.21&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-0.23&lt;sup&gt;***&lt;/sup&gt;</td>
<td>0.48&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-0.01</td>
<td>0.39&lt;sup&gt;***&lt;/sup&gt;</td>
</tr>
<tr>
<td>11</td>
<td>Teaching Performance</td>
<td>5.97</td>
<td>0.70</td>
<td>0.22&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-0.00</td>
<td>-11&lt;sup&gt;‡&lt;/sup&gt;</td>
<td>0.03</td>
<td>-0.13&lt;sup&gt;‡&lt;/sup&gt;</td>
<td>0.01</td>
<td>-10&lt;sup&gt;†&lt;/sup&gt;</td>
<td>0.43&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-19&lt;sup&gt;**&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Notes:  
* < .1  
† < .05  
‡ < .01  
<sup>a</sup> Female=2; Male=1  
<sup>b</sup> Chair=4; Full=3; Associate=2; Assistant=1  
<sup>c</sup> A high score indicates high research priority  
<sup>d</sup> Mean substitution for 74 missing values
Table 6. Regression Results for Research and Teaching Performance (Study 2)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Research Performance</th>
<th></th>
<th>Teaching Performance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( \beta )</td>
<td>( t )</td>
<td>( \beta )</td>
<td>( t )</td>
</tr>
<tr>
<td>Sex</td>
<td>.09</td>
<td>1.77</td>
<td>.15***</td>
<td>2.68</td>
</tr>
<tr>
<td>Age</td>
<td>-.08</td>
<td>-1.11</td>
<td>-.06</td>
<td>-.79</td>
</tr>
<tr>
<td>Rank</td>
<td>.31***</td>
<td>4.70</td>
<td>-.02</td>
<td>-.34</td>
</tr>
<tr>
<td>Pressure</td>
<td>.01</td>
<td>.10</td>
<td>.08</td>
<td>1.32</td>
</tr>
<tr>
<td>Priority</td>
<td>.06</td>
<td>.97</td>
<td>.02</td>
<td>.25</td>
</tr>
<tr>
<td>Research Goals^</td>
<td>.38***</td>
<td>7.40</td>
<td>-.06</td>
<td>-1.12</td>
</tr>
<tr>
<td>Research Strategies (13 items)</td>
<td>.22***</td>
<td>4.20</td>
<td>-.13*</td>
<td>-2.18</td>
</tr>
<tr>
<td>Teaching Goals</td>
<td>.02</td>
<td>.43</td>
<td>.43***</td>
<td>7.56</td>
</tr>
<tr>
<td>Conflict</td>
<td>-.14*</td>
<td>-2.48</td>
<td>-.05</td>
<td>-.85</td>
</tr>
<tr>
<td>(Intercept)</td>
<td>-16.52*</td>
<td>-2.04</td>
<td>3.89***</td>
<td>7.33</td>
</tr>
<tr>
<td>( R^2 )</td>
<td>.39</td>
<td></td>
<td>.25</td>
<td></td>
</tr>
<tr>
<td>( F )</td>
<td>18.40***</td>
<td></td>
<td>9.73***</td>
<td></td>
</tr>
</tbody>
</table>

Notes:  
\( N = 274 \)

* \( P < .05 \)
** \( P < .01 \)
*** \( P < .001 \)
^ Mean substitution for 74 missing values

Discussion

To summarize, we believe that perceived internal and external pressure to pursue research had dual and antagonistic effects. On one hand, pressure was positively associated with goal conflict and goal conflict, in turn, was negatively related to research productivity. On the other hand, pressure was positively related to making research a priority and research priority was positively related to the setting of high research goals and to the use of research strategies. The latter two variables were positively correlated with research productivity. The exact causal nature of this model is an obvious candidate for further research.

The results with regard to the age, sex and rank controls are also interesting (Table 5 and 6). Although rank is best viewed as an outcome variable with respect to research productivity, it is also associated with less pressure and goal conflict, presumably because a key career hurdle has been cleared when tenure is granted. It was also interesting that age and sex were correlated with research strategy development. Younger, male faculty appear more likely to pursue specific research strategies for enhancing their research productivity. In contrast, female faculty felt more pressure to do research, experienced more conflict and were better teachers than males. The best predictors of teaching performance, aside from being female, were teaching goals and not using effective research strategies. Frankly, this study was designed more to assess effective research strategies than teaching strategies. Thus, effective teaching strategies such as: increased student/teacher contact, increases preparation time outside of class, use of teaching aids such as teaching assistants and computers, and multiple teaching methods such as lectures and cases were not systematically assessed.
Future research efforts should attempt to delineate strategies for effective teaching.

Conclusions

The finding of a main intra-individual conflict effect on performance in both studies is intriguing in view of the differences between the studies with respect to setting, subjects, task, unit of analysis, time span and design. At the same time, the two studies were similar conceptually. Both manipulated or measured pressure. Both manipulated or measured goals. Both used task-specific measures of intra-individual goal conflict. And both utilized measures of task performance.

Although differences are to be expected, the use of complimentary methods, referred to as method triangulation, can lead, according to Jick (1970), to more valid results than using a single method. The premise is that the weaknesses in a single method will be counter-balanced by the strengths of another. For example, a potential weakness of Study 1 is the external validity of the laboratory simulation (despite its fidelity to a type of conflict common in work settings), whereas, a possible weakness of Study 2 is the internal validity of the correlational survey method. However, the two studies together exploit the assets of each and thus increase our confidence in the overall negative relationship between goal conflict and performance.

Since the Study 2 was a correlational survey, the issue of causal interpretation naturally arises. There are five reasons why we believe that causal interpretation of these results is reasonable: (1) Previous findings—Locke and Bryan (1968, pp. 405-406) summarized research both in the goal setting and verbal learning literature which found consistently that goal and other self-report measures obtained after performance yielded the same results as measures of the same variables obtained before performance. Locke and Shaw (1984) showed that post hoc measures can even have an advantage over pre-measures, namely in cases where subjects change their goals during the performance period; (2) Theory—there is a clear theoretical basis for the goal and performance relationship based on decades of casual research on goal setting theory (Locke & Latham, 1990); (3) Validity of performance measures—Taylor et al. (1984) validated self-report faculty productivity measures by comparing them to data obtained from VITA’s using a sub-sample from the same faculty population as that used in the present research. The correlation between the self report and Vita-based productivity measures was .88; (4) Replication—the key results from the second study replicated those obtained in the first study which used an experimental design. While these arguments do not prove conclusively that faculty were not rationalizing their previous performance, the above arguments make a causal interpretation plausible; (5) Previous studies—(n = 7 studies) of role conflict have found that the mean correlation between conflict and self-ratings of performance is .02 (Ilgen & Hollenbeck, in press, based on research by Jackson and Schuler). Although this basically null correlation may be the result of inappropriate measures of conflict, as suggested
by King and King (1990), it shows that there is no automatic bias in favor of a significant correlation between conflict and self-ratings of performance. It should be added that the mean correlations of conflict with objective performance (\( n = 3 \) studies) and others' ratings (\( n = 14 \) studies) are .01 and -.07. Note that these results are not practically different from the conflict vs. self-report results, thus further indicating that self-report data do not necessarily yield inflated results, at least insofar as goal conflict is concerned.

The present results support the soundness of the advice given by King and King (1990) with respect to the measurement of goal conflict. When the items are tailored to the goal and performance situation in question rather than being written in relation to conflict "in general", significant effects of conflict on performance are found.

The two studies agreed that a major correlate of intra-individual goal conflict was pressure. In Study 1 the pressure was externally induced, through instructions. Ilgen and Hollenbeck (in press) have argued that even though conflict is an experience, it would be helpful to show that this experience was related to incompatible external demands being made on the person. The first study did demonstrate this (Table 1). In Study 2 the pressure items included both externally perceived and internally imposed pressure, but both types of items loaded clearly on a single, homogenous factor. In the second study pressure was correlated to goal prioritizing and conflict. Pressure can be viewed as similar to an assigned goal which has been found consistently to affect personal goal (Locke & Latham, 1990). The present studies show, however, that such assignments can, if conflict-inducing, undermine performance. In Study 1 conflict undermined quantity but not quality, for reasons hypothesized earlier. In Study 2, conflict was negatively associated with research but not teaching for reasons which are not fully clear. Andrews and Farris (1972) and Hall and Lawler (1971) have shown, as did the present study, that pressure can be functional in arousing high performance when it is not excessive or conflict-producing.

The findings that commitment was related to performance when subjects have high goals (Study 1) and that goal level was related to performance (Study 2) were, of course, supportive of goal theory (Locke & Latham, 1990). However a significant finding of the present studies was that the goal conflict effect was not mediated by commitment, goal priority, goal level or strategies. The non-mediated effect of conflict was frankly unexpected. We also looked for moderator relationships (interactions) in both studies and found none. Although in the first study, goal conflict was curvilinearly related to commitment to quantity, it was linearly (and inversely) related to performance. The latter was also true in the second study. Careful analyses revealed that in Study 2 goal conflict was not curvilinearly related to any variable. (Nor was there an interaction effect of research and teaching goal level on conflict). We expected that goal priority would be equivalent to commitment in Study 2, but it turned out that priority was correlated with goal level (see Table 5). Thus, we had no adequate measure of commitment in the second study.
While it is helpful to rule out certain mediators, especially in one’s first foray into a new research sub-area, it would be even more helpful to find out what does mediate the effects of goal conflict on performance. Self-efficacy is a possible candidate since it is known to have a direct effect on performance independent of goals (Bandura, 1986; Locke & Latham, 1990). Conflict might also affect the three core goal mediators, i.e., effort, persistence and focus of attention, directly. Future studies should explore these possibilities.

Ilgen and Hollenbeck (in press) also suggest that conflict studies need to examine the degree to which the conflicting role (in our case, goal) outcomes are valued by the individual. They note that if one outcome is viewed as less important than another, conflict should be less than in the case where both outcomes are highly valued. Further studies should explore this issue.

Finally, some mention should be made of the possible trade-offs between conflicting goals. In the first study the correlation between quantity and quality was -.35 ($p < .01$), indicating a negative trade-off. On the other hand, it was also noted that groups in the quality condition produced the greatest number of useable (high quality) objects. This suggests that, at root, going for quality pays off, just as the Japanese claim. Recall that conflict (which appeared to lean toward the quality outcome) was positively related to quality of performance in Study 1, a finding that we interpret as meaning that the conflict subjects were being pulled out of their usual quantity mind-set. Further exploration of this phenomenon is clearly warranted.

In the Study 2 there was no significant correlation between research and teaching performance ($r = -.03$). This again suggests no bottom line negative trade-off; at the same time, however, it gives little solace to those who claim that better researchers make better teachers. They appear to be separate and independent outcomes. The key seems to be not to experience conflict between them. The experience of goal conflict may be the result of having personal values (e.g., the love of teaching or commitment to students) that conflict with the demands of the reward system (e.g., publishing gets raises and tenure). One solution to this might be to introduce multiple track tenure systems so that each person would be rewarded for doing what he or she likes and does best.

Acknowledgment: The authors would like to thank the University of Maryland, Business Management Faculty and two outside researchers for their helpful comments on the manuscript.

Notes
1. The authors are grateful to Dr. Elizabeth Weldon of the University of Indiana-Indianapolis for allowing the authors to use the group production task which she developed, to management and organization faculty for their helpful comments at a presentation of this research and to the Computer Science Center at the University of Maryland for providing the computer time for data analysis.
2. The twelve quality criteria were:
   1. Sticks are centered on triangle, and x’s on triangle face forward
   2. Middle craft stick goes into styrofoam 3/8"-1/2"
   3. Angle of 45 between middle craft stick and two other sticks
   4. The two other craft sticks should not touch the styrofoam
5. Equal distances between macaroni and popcorn on middle craft stick
6. Craft sticks should be glued neat and clean
7. Macaroni and popcorn should be glued neat and clean
8. The spirals of the pipe cleaner should be at equal distances
9. Equal distances between three balls on thread
10. Length of ties of the thread is 1/2"
11. Wrapping of middle styrofoam should be smooth and round shape
12. All three balls must be above red x’s

3. In this first study we used a group task with the expectation that, in addition to conflicts within members about goals, there might be conflicts among the members of each group which could be related to performance and attitudes. However, these expectations did not materialize; that is, no measure of intragroup variability showed any relation to other variables. Thus we used group means in all the analyses to be reported.

4. We considered using raw number of high quality objects as the quality measure. However, this measure correlated .81 (p < .01) with raw number produced among the conflict groups and .96 (p < .001) with number produced among the quality/quality groups thus making it a proxy for number produced. (It was uncorrelated with number produced among the quantity/quantity groups.) In contrast the quality ratio was uncorrelated (r’s = 0) with number produced within the quantity and quality groups and correlated -.52 with productivity within the quality groups. Thus we concluded that the ratio measure was more suitable than the raw quality measure.

5. The University of Maryland is a “publish-or-perish” institution and departments typically rate the journals in their area (implicitly or explicitly) as to quality. Further Taylor et al. (1984) found that self-reported faculty productivity correlated highly with actually productivity as derived from VITA’s. Thus there is reason to believe that the data used here reasonably valid.

References


