# If You Can Use Them: Flexibility Policies, Organizational Commitment, and Perceived Performance

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This study links workplace flexibility policies—formal, informal, and perceived usable—to organizational commitment and self-reported productivity. Professional and technical employees of biotechnology firms were surveyed. Where employees could freely use policies, a positive association with outcomes is found. The article contributes a new measure to capture employees' organizational experience, relevant to work and family research.

How do we keep people? Through flexibility, in part. We particularly need to retain people while the primary product is being developed, and sometimes the managers continue to want to [retain them] because they want to maintain a pipeline... In small biotech firms, you know everyone well, you know their personal situations, and you can make accommodations. I bend over backwards because individual people are our most important asset. I try to create an environment supportive of scientists, who are expressive and creative, like artists. Also, many managers are young, in their 40s but with young kids at home. When they are thinking of leaving, flexibility plays a big part. Also it helps me in hiring.

Human Resources Manager in a biotechnology firm

ALL EMPLOYEES OCCASIONALLY REQUIRE DAY-TO-DAY FLEXIBILITY to manage demanding jobs and home or family lives. Those with two-job families and caring responsibilities are especially likely to need such flexibility. Yet researchers have shown that many employees are loath to use familyfriendly policies, even intended beneficiaries, such as female employees with young children (Bailyn 1993; Williams 2000). While consultants market family-friendly policies as a popular benefit, few scholars have demonstrated the mechanisms through which such policies function (or do not) to enhance

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INDUSTRIAL RELATIONS, Vol. 42, No. 2 (April 2003). © 2003 Regents of the University of California Published by Blackwell Publishing, Inc., 350 Main Street, Malden, MA 02148, USA, and 9600 Garsington Road, Oxford, OX4 2DQ, UK.

firm performance (for exceptions, see Drago, Caplan, and Costanza 2000; MacDermid and Williams 1997).

Industrial relations researchers have shown specifically how firms benefit from flexible high-performance workplaces. For instance, job enrichment– related policies require bundled implementation to be effective (MacDuffie and Krafcik 1992; Ichniowski et al. 1996; Appelbaum and Batt 1994). Work-family scholars also study flexibility that supports employees, often focusing on scheduling and place of work (e.g., Perin 1991; Rayman and Bookman 1999). These studies pose this issue: Under what conditions do flexibility policies contribute to positive *firm* outcomes such as employee commitment and productivity? A growing literature connects employer and employee flexibility using both industrial relations and work-family concepts (e.g., Kossek and Ozeki 1998; Batt and Valeur, this issue).

This study uses original survey data to test hypotheses from the workfamily literature about the role of firm-level flexibility practices for professional and technical employees.<sup>1</sup> The study focuses on workplace flexibility for two reasons. First, numerous studies of employee benefits already exist (e.g., Catalyst 2000), and these are often undertaken by firms themselves. Second, flexibility can be more important on a day-to-day basis for many employees than other benefits, such as a child care center. The key research questions are: Are firm-level flexibility practices significant predictors of organizational commitment and individuals' productivity, as reported by employees? And if so, under what conditions can flexibility be linked to these positive organizational outcomes?

# Theory: Flexibility, Commitment, and Productivity

Flexibility is an essential factor in understanding twenty-first century jobs. Technology has made work more portable and ubiquitous. No one knows exactly how many firms offer *flextime*, broadly defined as the ability to schedule flexible starting and quitting times, sometimes with a core-hours requirement. A Hewitt Associates (1996) study of 1050 major U.S. employers reported that 68 percent of all U.S. firms offered flextime. However, in many workplaces, flexibility is constrained by the nature of the task to be

<sup>&</sup>lt;sup>1</sup> Research on the biotechnology industry was conducted in part under a grant from the Alfred P. Sloan Foundation to the Radcliffe Public Policy Institute at Radcliffe College. The Sloan Foundation project team included: Françoise Carré (co-principal investigator), Paula Rayman (co-principal investigator), Lotte Bailyn (study director), Ann Bookman (study director), Constance Perin (study director), Susan C. Eaton (senior research associate), Sandra Resnick (research associate), Wendy Jade Hernandez (research associate), and Pamela Joshi (research analyst).

performed (e.g., hospitals, 24-hour factories, or police departments). Hewitt also relies on human resources officers rather than employees themselves as sources.

Flexibility as a construct includes much more than starting and quitting times. Many employees require flexibility to visit children's schools, take elders to the doctor, or take time off during a family emergency. Flexibility also may mean taking days off in return for working at nonstandard times or being able to work part time temporarily at certain points in life (Moen 1996).

Flexibility *formally* offered by the employer is insufficient as an indicator of flexibility available to the employee. Many employers limit flexibility to a small portion of the workforce or workday. When measuring formal flexibility policies, we also should seek to understand informal ones. The culture of the workplace can determine whether work-family benefits are available and to whom; in some cases, using policies is discouraged or has negative career effects (Bailyn 1993; Williams 2000). Alternatively, supervisors can permit more flexibility than is formally allowed, encouraging employees to take time off unofficially, so that flexibility becomes invisible to higher-level managers (Eaton 1999). I call this *informal flexibility*.

Here I propose a distinct, more precise measure of available flexibility policies: the extent to which employees feel free to use such policies, whether formal or informal. I construct a new measure in this study, drawing on multiple workplace interviews in which employees discussed the lack of usability of policies that formally or informally permitted flexibility but where daily practice discouraged it. Specifics differed, but the concept was the same: Some employees did not feel free to use the policies they theoretically enjoyed.<sup>2</sup>

# Flexibility and Outcomes

Family-friendly policies in general can reduce absenteeism and turnover (Meyer and Allen 1997; Bailyn et al. 1996). Since turnover can cost 200 percent of an employee's salary, successful work-life programs can pay for themselves (Martinez 1997:111–2). Studies show that companies offering family-friendly policies are successful at retaining employees, even if individuals did not use the policies themselves (Grover and Crooker 1995; Thompson et al. 1997). Policies do matter.

 $<sup>^{2}</sup>$  While I report here only on a survey, the survey was preceded by more than 70 semistructured interviews in which intensive case-study research was conducted in companies. I based some of the survey questions on interview data as to what mattered to employees. More details about the interview sample and the interview structure and questions are available from the author and are explained in Eaton (2000).

However, not all scholars agree that flextime and other family-friendly practices represent the solution to work-family conflict.<sup>3</sup> Some note organizational culture barriers, which are addressed in the construction of this study. Jurzyck (1998) argues that "mommy track" working arrangements reinforce a sexual division of labor where women do most home work and sacrifice their wages.

Such disagreements in the literature led to this study to distinguish formal flextime from what is actually experienced as flexibility and to learn what happens in practice at specific workplaces.

# Relationship of Flexibility to Organizational Commitment

Flexibility includes but is not limited to autonomy on the job. Increased autonomy is linked positively with job satisfaction and motivation (Hackman and Oldham 1980) and can generate higher organizational commitment. Flexibility is defined here to include the ability to change the temporal and spatial boundaries of one's job. I propose hypotheses concerning both flexibility and autonomy.

*Hypothesis 1. Greater employee flexibility over the boundaries of work is associated with positive organizational outcomes.* 

Hypothesis 2. Control or autonomy over time, pace, and spatial aspects of work itself is associated with positive organizational outcomes.

While performance is influenced by many factors, organizational commitment (OC) is one key contributor, especially where loyalty and extra effort matter (Matheiu and Zajac 1990). More than for job satisfaction, higher levels of OC are correlated with lower turnover and better performance on the job (Meyer and Allen 1997). This study examines positive OC of the *affective* variety, not the negative *continuance commitment* generated by having no other options.<sup>4</sup> Recent OC research shows no gender differences after controlling for the specific type of job involved (Marsden, Kalleberg, and Cook 1993).

<sup>&</sup>lt;sup>3</sup> Several authors have noted the possibilities and even probabilities of synergies in the realm of work and family, not only conflict (see Bailyn 1993; Barnett and Rivers 1996; Rothbard 1998). This study does not discount this, although it is not explored here. Flexibility can enhance synergy as well as ease conflict.

<sup>&</sup>lt;sup>4</sup> Organizational commitment has been defined as including three types: affective, meaning the feeling of loyalty and willingness to "go the extra mile"; normative, meaning a feeling that one "should" stay on the job; and continuance, meaning that one has little choice but to stay in the organization (Meyer and Allen 1997). Negative commitment is usually not a desirable state. I do control for it, however, in asking how hard it would be for employees to find a comparable job. Including this variable makes no difference in the outcomes reported later.

*Hypothesis 3. For workers with similar jobs, organizational commitment will not vary by sex.* 

Given that affective commitment has positive organizational outcomes, do particular workplace policies encourage higher levels of such commitment? Past researchers call for broader studies of OC to account for the effect of family life on commitment (e.g., Gray 1989:810) and for crossorganizational studies (Mathieu and Zajac 1990). Researchers find a positive relationship between family-friendly policies and OC or citizenship behavior, in diverse settings.<sup>5</sup>

*Hypothesis 4. Flexibility policies will be associated positively with affective organizational commitment.* 

# Relationship of Flexibility to Productivity

Critics skeptical that work-family policies have an impact on morale are even less convinced that they are related to productivity itself (e.g., Robinson and Godbey 1997). Few reliable measures of productivity in professional and white-collar workplaces exist, whereas few studies of flexible workfamily policies have been done in blue-collar settings (see Appelbaum et al. 2000 and Batt and Valeur this issue for exceptions). In professional workplaces, I predict such policies will be important to employees' productivity, as they report it.

*Hypothesis 5. Increased flexibility in professional work settings will be associated with increased self-perceived productivity.* 

# Defining Work-Family Flexibility at Work

What are work-family flexibility policies? Companies often measure their family friendliness by whether they have a formal set of policies in place. I investigate flexibility policies that affect schedules, work practices, and the design of work for employees rather than those that do not alter work routines.

Flexible approaches provide an alternative to working the traditional 9to-5, five-day-a-week schedule. While these may be company-wide policies,

<sup>&</sup>lt;sup>5</sup> See, for example, Scheibl and Dex (1999) on female workers and Lankau and Scandura (1997) specifically with respect to family-friendly policies for male and female managers across organizations. The existence of flexible work programs was shown to be significantly related to organizational commitment and job satisfaction of female managers (Lankau and Scandura 1999:387).

they often require an employee's supervisor to approve their use, whether one time or long term. By *formal policies*, I mean written, officially approved human resources policies, as well as any official policies that give supervisors discretion to provide flexibility.<sup>6</sup>

*Hypothesis 6. Organizations'* formal *policies supporting employees' flexibility to manage work and family responsibilities are positively related to employees' organizational commitment and self-reported productivity.* 

Research shows that an organization's informal culture is more important than formal policies in influencing and shaping employee behavior (Bailyn et al. 1996). Hochschild (1997) and others document the low rate of utilization of work-family policies even when they do formally exist (see also MacDermid et al. 1999). By *informal policies*, I mean flexible policies that are not official and not written down but are still available to some employees, even on a discretionary basis.<sup>7</sup>

*Hypothesis 7a. Organizations'* informal *policies (or practices)* supporting employees' flexibility to manage work and family responsibilities will be positively related to employees' organizational commitment and perceived productivity.

*Hypothesis 7b. Organizations'* informal *policies (or practices) supporting employees' flexibility to manage work and family responsibilities will be more strongly positively related to employees' commitment and perceived productiv-ity than will formal policies.* 

# Rhetoric or Reality: Feeling Free to Use Existing Policies

Even informal policies may not be enough to create "felt" flexibility and thus to influence employee commitment and productivity. One study showed that some supervisors apply policies inconsistently even within their work groups (Eaton and Bailyn 2000). On a day-to-day basis, managers often express ambivalence about whether to promote flexible policies. They worry about "everyone" wanting to schedule flexibly. In the least flexible company studied herein, no one was actually allowed to work nonstandard hours, although a flextime policy existed. One chief executive officer (CEO)

<sup>&</sup>lt;sup>6</sup> These definitions were developed in part through interviews with human resources personnel in this industry and others. Relatively few companies, particularly small companies, have extensive formal, written policies on all these areas or even one or two, but they do cluster together, and at least some biotech firms had formal or informal examples of each policy in effect.

<sup>&</sup>lt;sup>7</sup> Remember that informal policies do not have to apply to the employee personally but to someone in the company he or she knows.

refused to allow an administrative assistant to adjust her working hours by 30 minutes a day to accommodate child care for her newborn infant. This demonstrates again that while policies are important, so is the perceived ability to use such policies.

I propose that flexible policies must be available, either formally or informally, to be used. The next hypotheses concern employee beliefs that they are free to use these policies. I call this concept *perceived usability*, a new way to understand whether flexibility policies that exist are meaningful to employees. It is distinct from informal policies because it applies to each individual's view of his or her own comfort level with using policies, not to whether others can use them.

Hypothesis 8a. Organizational commitment and productivity will be positively related to employees' perceptions of whether they are actually free to use existing formal or informal flexibility-related policies.

Hypothesis 8b. Employee commitment and productivity will be more strongly related to employees' perceptions of whether they are free to use work-family policies than to whether either formal or informal flexibility-related policies exist.

# Research Setting: Biotechnology Firms

I investigate these questions in young entrepreneurial organizations where male and female professionals work in nearly equal numbers. Many prior studies were conducted in large firms, so this adds a new dimension (Mac-Dermid et al. 1999). The U.S. biotechnology industry includes 1300 companies engaging in the research, development, production, and commercialization of products using recombinant DNA, cell fusion, and novel bioprocessing techniques (Office of Technology Asessment 1991).

U.S. biotech companies average 150 workers and employ a total of 153,000 people (BIO 1999), with a high concentration of "knowledge workers." Professionals compose at least 50 percent of the workforce, often including 20 percent or more Ph.D.s (PHRMA 1997). Scientific jobs in biotechnology are usually gender-balanced within occupations, since roughly 50 percent of biotech professionals are female (DeHaan 1997; Radcliffe Public Policy Institute 1999).<sup>8</sup> This presents unusual opportunities to study

<sup>&</sup>lt;sup>8</sup> Women compose nearly 40 percent of life sciences graduates, even at the Ph.D. level, more than in any other natural scientific field (Valian 1999).

gender-related issues at the job and firm level, since occupational segregation within establishments is still common (Baron and Bielby 1980; Reskin 1993).

This industry is a particularly good place to study flexibility policies, commitment, and productivity. The workforce is relatively young, with an average age in the middle 30s. Two-career couples predominate. Many firms are less than 10 years old and have not developed traditional cultures or gender roles (see Baron et al. 2001). Most biotech firms are networked in one form or another via partnerships, alliances, formal and informal collaborations, and agreements (Powell et al. 1996). This network increases labor market information. Performance is rewarded contingently, with bonuses and stock. Long-term compensation is virtually absent. Firms are intensely competitive. Firm-specific skills involve advanced scientific work on projects that are highly specialized and take significant time to learn. In general, firms wish to retain workers but cannot promise them security—since virtually no one can predict accurately the results of novel genetic experiments. Skilled biotech employees have considerable opportunity to move from one company to another, making loyalty a key concern of employers and a critical factor in organizational practices.

# Methods and Data

The data for this study are drawn from original surveys of professional and technical workers conducted in seven biopharmaceutical firms in one state. The survey method was chosen to gather representative data on key issues after an intensive interview study. The firms were picked to represent a cross section of various sizes, ages, and technologies within the field. One firm was large, employing more than 1000 people, and the others had fewer than 200 employees. Selection bias was minimal, since seven of the eight firms invited to participate agreed to permit administration of the employee survey, resulting in a survey population of 1030 employees.<sup>9</sup> In these firms, professionals and technical workers are scientists, researchers, and managers. Employees were divided evenly between men and women. No systematic bias in size or age of firms was found in comparing this sample with a larger, stratified random sample of biotechnology firms in the state.<sup>10</sup>

<sup>&</sup>lt;sup>9</sup> The single firm declining to participate had about 700 employees, many young and single, and did not offer any formal work-family policies, so it was not an ideal site for this study.

<sup>&</sup>lt;sup>10</sup> The population of firms was stratified into large and small-to-medium groups and into age groups by 5-year intervals.

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The original pencil-and-paper survey contained 105 items with 212 variables<sup>11</sup> and was administered in the firms between January and June 1999.<sup>12</sup> A total of 1030 professional and technical employees were given the survey either in person or via a work mailbox.<sup>13</sup> Surveys included ID numbers to enable evaluation of the response rate among different classifications and companies.<sup>14</sup> Most of the 463 completed surveys were returned via postage-paid envelopes, and about 50 were hand-collected at work sites.

The overall survey response rate of 44 percent ranged from lows of 35 percent in the smallest and largest companies to 50 to 70 percent in the midsized companies.<sup>15</sup> Respondents overall were 55 percent female, 37 percent scientists, 27 percent other professionals, and 18 percent managers, with an average age of 37 and average firm tenure of 4.7 years. Means and standard deviations of selected demographic characteristics of survey respondents are found in Table 1.

# Measuring Independent Variables: Formal, Informal, and Usable Policies and Control

To estimate workplace flexibility, I constructed an *index of work-family policies*. Generally, indices provide more robust data than do individual measures. Seven flexibility practices were combined to make the index.<sup>16</sup> The specific practices are *flextime* with flexible beginning or ending working time, sometimes with core hours required; *part-time jobs*; telecommuting or

<sup>&</sup>lt;sup>11</sup> It is available from the author but is not reproduced here for reasons of space. For more detail on the survey methodology and the cross-level design (see Eaton 2000).

<sup>&</sup>lt;sup>12</sup> The seventh firm was a very small startup, and employees took the survey online. In all, 5 of 10 employees responded, and although 900 employees had the option of using the Web-based survey at other firms, only 24 others responded using the Web format. These data were translated into an Excel spreadsheet and added to the coded data already entered from the paper surveys. The survey was not in any one company for longer than 4 weeks.

<sup>&</sup>lt;sup>13</sup> I am grateful to Judy Marshall for suggesting that I hand distribute the surveys to improve response rate. In the five smaller firms, virtually all the employees were professional and technical.

<sup>&</sup>lt;sup>14</sup> The data permits evaluation of within-organization differences as well as between-organization differences and trends in the entire sample.

<sup>&</sup>lt;sup>15</sup> Those who responded were not significantly different from the total workforce in demographic characteristics, with two exceptions. A higher proportion of managers than in the firm (33 percent of the sample compared with 20 percent in the workforce) responded to the survey at one company. Second, slightly more women than men responded, perhaps because of a higher level of interest, although this was mainly true in the largest company. Detailed response rates are available from the author.

<sup>&</sup>lt;sup>16</sup> I also examined the policies individually but here present the findings for an aggregated index. Disaggregated analyses are available from the author. No significant differences in findings resulted, except that for predicting productivity, "feeling free to use part time" was singly significant, and for commitment, "feeling free to use flextime" was individually significant.

	Mean (SD)
Demographics	
Female	0.55 (.5)
Married	0.64 (.5)
Age	36.4 (8.2)
Have children	0.52 (.5)
Have children and support at home <sup>a</sup>	0.15 (.36)
Single parent	0.01 (.2)
Dual income without children	0.27 (.5)
Nonwhite or Hispanic	0.12 (.32)
Born outside U.S.	0.18 (.39)
Education (highest degree achieved)	
College degree	0.47
Master's degree	0.20
Ph.D.	0.16
Professional position	
Scientists	0.37 (.5)
Other professionals	0.27 (.4)
Managers	0.18 (.4)
Work status	
Promoted with company	0.64 (.5)
Part time (<40 hours)	0.03 (.18)

Personal Characteristics of Biotechnology Employee Respondents (n = 383)

"Support at home is defined as a partner or spouse at home either full or part time for employees with children living at home.

*flexplace*, such that all or part of the work week occurs at home; *job sharing*, where one job is jointly undertaken by two or more persons; *compressed work weeks*, where employees compact total working hours into 4 days rather than 5; *unpaid personal leave* in addition to the 12 weeks mandated by the Family and Medical Leave Act (FMLA) for the serious illness of a family member or self; and whether employees can use their own *sick leave to care for ill children*.<sup>17</sup> While it is unlikely that any one person would use all these policies, this study, like others (e.g., Osterman 1995), considers a range of possible approaches to work-family policy. These particular flexibility items are common in the literature.

Concerning each item, employees responded "Yes" or "No" to four questions. To create the independent variable, *formal policies*, one of these

#### TABLE 1

<sup>&</sup>lt;sup>17</sup> The data also were analyzed for each of the policies separately, but most companies did not formally offer more than two or three of the policies (none allowed parental leave beyond the FMLA, for instance, and none allowed job sharing). The most popular benefit was use of employee sick leave for ill children; five of the seven companies formally allowed that.

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questions was used: "Are these policies formally available?" If the employee did not respond, the policy was designated as not available formally, to his or her knowledge.<sup>18</sup> The index averages individual responses on the separate policies, so each individual was associated with a score on *formal policies* from 0 to 7. The mean score on *formal policies* was 2.32 (SD 1.66).<sup>19</sup>

The study also measured whether these policies were available at an informal level from the employee's perspective.<sup>20</sup> The mean score on the informal index of work-family policies was 3.19 (SD 2.1), higher than for formal policies. This indicates face validity, since it seems likely that employees can perceive flexibility-related benefits in informal work settings, even if these are not formal policy. This might consist of an informal arrangement between an employee and a supervisor for flexible hours. The standard deviation is larger perhaps because informal policies are likely to be experienced differently, even within a single company.

The third independent variable is an index of the same flexibility items. This variable is called *perceived availability of work-family policies (usable)*. In another survey question not reported here, one-quarter of respondents indicated concern that their careers would be affected negatively if they used the policies. This suggests possible problems with how policies are implemented. So the variable *usable* combines an individual response to the question: "If the employer offers from one to seven benefits, either formally or informally (or both), does the employee feel free to use those benefits?" The employee must respond that the employer offers the benefit(s) *and* that he or she feels free to use the benefit(s) before the employee is included as a positive respondent. For an employee whose employer offers no formal or informal benefits, the employee's response was defined as 0 on *usable* for all policies, since no policies are available to use.

The average *usable* score on a scale of 7 was 1.5 (SD 1.52). Managers were more likely to give their firms high scores (p < 0.05), whereas no other demographic characteristics were associated with *usable*. This also suggests face validity, since managers are likely to control their schedules.

<sup>&</sup>lt;sup>18</sup> Single-question missing data on these questions are counted as indicating that the policy was "not available." The individual does not know that the policy is available, so he or she should be counted as saying it is not available, at least to his or her knowledge at the time of the survey. While this undoubtedly lowers the overall scores and sample size, my decision to require an affirmative sign that policies were available seems conservative and thus appropriate; otherwise, the findings would have been more dramatic (for example, if the study used a single measure per company for formal availability), since not knowing about an existing formal policy also could be interpreted as not feeling free to use it.

<sup>&</sup>lt;sup>19</sup> For company-specific responses on all three policy variables, see the Appendix.

<sup>&</sup>lt;sup>20</sup> This survey question was piloted with eight biotechnology employees, and they had no problem understanding the question's meaning. They understood that a policy might either be available both formally and informally or just one or the other.

One additional factor could relate both to employees' productivity and commitment and to flexibility. In the study it is called *control*, defined as a subset of issues related to employee control over the time, pace, place, and scheduling of work. A three-item index called *control-timelflex* summarizes employees' influence or control over the pacing, timing, and place of work.<sup>21</sup> Being able to use flexible work policies could give employees a greater sense of control over the daily timing, pacing, and location of work. Control also might influence employees' perceptions of being able to use work-family policies. The question of influence direction cannot be answered definitively with these data, but it merits future study.

No important multicollinearity problems were found among the independent variables. The highest correlations are between *formal* and *informal policies* (r = 0.314) and between *informal* and *usable policies* (r = 0.473). While informal policies are more likely to be perceived as usable, the concepts are still distinct. Also, usable policies were required by definition to be either formally or informally available, so the positive correlation is not surprising.

#### Dependent Variables

The dependent variables are *organizational commitment* (OC) and *perceived productivity*. Mowday, Steers, and Porter defined OC as

... the relative strength of an individual's identification with and involvement in a particular organization. Conceptually, it can be characterized by at least three factors: a) a strong belief in and acceptance of the organization's goals and values; b) a willingness to exert considerable effort on behalf of the organization; and c) a strong desire to maintain membership in the organization [Mowday, Porter, and Steers 1982:27].

The OC scale is drawn from Lincoln and Kalleberg (1990). It is a fiveitem scale that is a subset of items developed by Mowday, Steers, and Porter (1979).<sup>22</sup> Applied to this data set, the Cronbach's alpha is 0.62. Although a

 $<sup>^{21}</sup>$  Cronbach's alpha for the *control* scale = 0.68. Factor analysis of these items confirmed one scale, despite the low Cronbach's alpha. Factor loadings are *control over locale and time of work:* 0.79; *control over pace of work:* 0.81; and *control over breaks:* 0.74. There is one eigenvalue over 1: It is 1.8, accounting for 63 percent of variance.

<sup>&</sup>lt;sup>22</sup> Items comprising the commitment scale were: Effort: I am willing to work harder than I have to to help this organization succeed; Loyalty (R): I feel very little loyalty to this organization; NoMistake (R): I made a mistake working for this organization; Agree (R): I often disagree with this company's policies concerning employees; MorePay: I would turn down another job for more money to stay with this organization; five-point Likert scale with 1 = strongly disagree and 5 = strongly agree (Lincoln and Kalleberg 1990).

higher alpha is desirable, this level is acceptable.<sup>23</sup> The mean commitment score on this scale was 3.67 (SD 0.66) on a scale of 5, which is close to the mean from other samples (Kalleberg and Mastekaasa 1994).<sup>24</sup>

Experts measure productivity in complex ways, but in an industry where managers do not have a single or composite measure for productivity, self-report is one accepted method.<sup>25</sup> In this study I measured productivity as employees estimated it, compared with other work periods in their lives, among well-educated scientists, researchers, and managers.<sup>26</sup> Employees were asked to think of the time in their lives when they had been most productive and to evaluate how productive they were under present conditions if the former time had been a 10 on a scale of 1 to 10.<sup>27</sup> The mean of respondents' score was 7.61 (SD 1.71), and the distribution was skewed slightly to the right.

# **Control Variables**

Various factors are known to contribute to employees' organizational commitment and productivity: these include tenure, position, income, age, education, and psychological predisposition. In general, this study employs the same control variables as Kalleberg and Reve (1993), with the goal of eliminating other possible explanations for organizational commitment or

<sup>&</sup>lt;sup>23</sup> A factor analysis of the five items produced only one factor with an eigenvalue in excess of 1.0 (see also Marsden, Kalleberg, and Cook 1993). While eliminating any item did not increase the reliability, possibly this scale should be updated or expanded for this workforce to achieve a higher alpha.

 $<sup>^{24}</sup>$  Where the employee answered four of the items, I averaged the responses to impute the answer to the fifth; where he or she did not answer at least four, I discarded the data.

<sup>&</sup>lt;sup>25</sup> Productivity is notoriously hard to measure in nonmanufacturing industries such as biotechnology. Research and development staffs typically measure their results by patents or publications achieved, experiments completed, and successful drug development—but all these results require years of work and the involvement of many people. When I asked managers in biotechnology firms how they measured their employees' productivity, they answered that they "knew" who was productive and who was not but that there was no way to measure it specifically. Finally, while there may be a self-serving bias among respondents, where biases in self-report data are consistent across respondents, the results will be unaffected except for the intercept. For an example in evaluating absenteeism, using a similar measure, see Drago and Wooden (1992).

<sup>&</sup>lt;sup>26</sup> I recognize that this means that productivity cannot be compared between employees in the same workplace because each employee is referencing his or her own previous experience. However, I believe that this is warranted given the highly individual nature of people's work-family experiences and the flexibility they need. Results must be interpreted with caution, however, because "perceived productivity" differences will not be between employees but within an employee's own work history.

<sup>&</sup>lt;sup>27</sup> Thanks to Lotte Bailyn for the use of this question from a previous study.

productivity.<sup>28</sup> The study also controls for household income, age, and presence of children at home.<sup>29</sup>

The control variables are not highly correlated.<sup>30</sup> Means, standard deviations, coding procedures, and Cronbach's alphas for all variables and scales are presented in Table 2.

I used ordinary least squares (OLS) multivariate regression analysis to test the hypotheses. Although all the data do not precisely conform to assumptions of normality, the survey sample size is large enough and the deviations slight enough that this method is appropriate<sup>31</sup> (Kleinbaum, Kupper, and Muller 1988). After deletion of missing data, the data set included 383 usable responses.

#### Analysis

Findings for predicting commitment and productivity are reported in Tables 3 and 4. For *organizational committment*, models testing all three types (*formal, informal*, and *perceived usable*) of work-family policies are presented without *control*, and a fourth model is presented with *usable* only, with *control*. For *productivity*, the same pattern applies; other possible models with *control* are similar but not shown.

Usability of work-family policies does have a small, positive, statistically significant effect (beta = 0.118, p < 0.05) on organizational commitment, where all the controls but not the independent variable of control are

<sup>&</sup>lt;sup>28</sup> These included gender, education, managerial status, and size of the company (in this case I used *small company* versus *not small company*). I did not use *independent company* because all companies were independent. Some employees might value flexibility more at particular times in their lives (Moen 1996). I controlled in more extensive analyses (not shown here) not only for age, having children, and marital status but also for specific combinations of household groups. Means for each family group are available from the author. Differences are not great, but single parents and married parents with support at home have the highest levels of commitment. These differences were not significant in final outcomes.

<sup>&</sup>lt;sup>29</sup> If someone does not have children, for instance, he or she is less likely to know, or to care, whether he or she can take sick leave to care for children. Although elder care responsibilities also could enter into employees' valuing of work-family policies, relatively few respondents currently had elder care responsibilities (13 percent), and those who did generally spent less than 1 hour per week on them. For this reason, elder care was not included as a control variable.

<sup>&</sup>lt;sup>30</sup> The highest correlation is between age and having children, 0.445; the next highest were between household income and age and education. Managerial status was correlated at the 0.27 level with household income and at the 0.21 level with years of service. All others were below 0.2. These are usual correlations and should not affect the analysis. Full information on correlations is available from the author.

<sup>&</sup>lt;sup>31</sup> I considered other methods of data analysis, such as ordered probit, but the dependent variables are continuous and reasonably normally distributed, since one is an index that combines multiple Likert scales and the other is a distribution skewed only slightly right.

#### TABLE 2

MEANS, STANDARD DEVIATIONS FOR DEPENDENT AND INDEPENDENT	VARIABLES;
Alpha Reliabilities for Scales $(n = 383)$	

Dependent Variables:	Mean (SD)	Cronbach's Alpha
Commitment index	3.65 (0.65)	0.62
(1 = lowest commitment, 5 = highest)		
Self-reported productivity (0 = lowest productivity	7.63 (0.55)	n/a
compared to most productive work period; 10 = highest)		
Independent Variables	Mean (SD)	Cronbach's Alpha
Formal W-F flexibility policies index		0.59
(0 = no usable policies, 7 = all usable policies)	2.32 (1.66)	
Informal W-F flexibility policies index		0.77
(0 = no usable policies, 7 = all usable policies)	3.19 (2.1)	
Perceived usability of W-F flexibility policies index		0.67
(0 = no usable policies, 7 = all usable policies)	1.5 (1.52)	
<b>Control flex/time</b> (1 = no influence,		0.68
5 = complete control of time/flex/pace of work)	3.8 (0.8)	
Control Variables		Mean (SD)
Age (in years)		36.4 (8.2)
Education (less than $HS = 0$ , $HS$ degree = 1, associates deg	ree $= 2$ ,	3.2 (1.2)
four-year college degree = 3, master's degree = 4, and docted	oral degree $+ = 5$ )	
Sex (female = 1)		0.55 (0.5)
Have children (yes = 1)		0.52 (0.5)
Years of service		4.8 (3.5)
Manager (manager = 1)		0.20 (0.40)
Small company (less than 250 employees = 1)		0.32 (47)
Household income $(1 = \text{less than } \$20\text{K}, 2 = \$20-39,999\text{K},$		5.03 (1.47)
3 = \$40-49,999K, 4 = \$50-74,999K, 5 = \$75-99,999K,		
6 = \$100 - 149,999K, $7 = $150$ K+)		

included. This supports hypotheses 1 and 4. The only other statistically significant predictor is working for a *small company*, associated with lower levels of OC.<sup>32</sup> This is consistent with other studies, since small companies offer less job security. No other control variables are statistically significant, and most are small.

Neither the presence of *formal* nor *informal* work-family policies is related to *organizational commitment*; this does not support hypotheses 6 and 7a and 7b in part. However, the *usability* of work-family policies is associated positively and significantly with *organizational commitment*, supporting hypotheses 8a and 8b. Employees who feel free to use flexibility policies are likely to report positive OC—but the existence of flexibility

<sup>&</sup>lt;sup>32</sup> This is similar also to Kalleberg and Reve (1993).

#### TABLE 3

	Model 1 Beta	Model 2 Beta	Model 3 Beta	Model 4 Beta
Dependent variable				
Organizational commitment <sup>a</sup>	3.49	3.74	3.73	3.37
Independent variables				
Formal policies	0.061			
Informal policies		0.052		
Perceived usable policies (usable)			0.118**	0.093*
Control flex/time (control)				0.142***
Control variables				
Age	0.113*	0.112*	0.108	0.09
Education	-0.021	-0.022	-0.015	-0.023
Female	0.038	0.037	0.036	0.034
Have children	-0.089	-0.089	-0.087	-0.086
Household income	-0.08	-0.08	-0.092	-0.093
Yrs. of service	-0.042	-0.044	-0.039	-0.048
Manager dummy	0.069	0.066	0.062	0.07
Small company	-0.147***	$-0.15^{***}$	-0.152***	-0.157***
<i>R</i> <sup>2</sup>	0.047	0.046	0.057	0.074

Predicting Organizational Commitment Using Flexibility Policies Using OLS Regression (n = 383)

\**t*-test for item is significant at p < .10 (two-tailed tests).

\*\**t*-test for item is significant at p < .05.

\*\*\**t*-test for item is significant at p < .01.

"Organizational commitment is defined by a five-item scale that includes measures of loyalty, willingness to exert effort, identity with company values, and intent to stay.

policies alone, even informal ones, is not associated with positive OC. This could explain previous studies that did not find positive associations between work-family policies and commitment, since an appropriate measure of *usability* was not often tested.

The additional independent variable *control* directly predicts both *organizational commitment* and *productivity* outcomes, and it absorbs some of the effect of *usable* when it is added to the model in predicting OC. This supports hypothesis 2 concerning autonomy. The positive association with work-family policies is smaller in model 4 (Table 3), and *usable* work-family policies are only marginally significant predictors here (beta = 0.093, p < 0.10). *Small company* remains significant and negative, and *control* is positive and significant in this model (beta = 0.142, p < 0.01). Thus one mechanism for the apparent effect of "perceived usable" work-family policies may be increased control of work time, place, and schedules. However, this does not account for the entire relationship because *usable* work-family policies still retain their own value in predicting OC.

#### TABLE 4

	Model 1 Beta	Model 2 Beta	Model 3 Beta	Model 4 Beta
Dependent variable				
Productivity (perceived) <sup><i>a</i></sup> constant	7.675	7.751	7.772	7.413
Independent variables				
Formal policies	0.110**			
Informal policies		0.102**		
Perceived usable policies (usable)			0.180***	0.157***
Control flex/time (control)				0.127***
Control variables				
Age	0.022	0.012	0.008	0.013
Education	-0.025	-0.028	-0.016	-0.02
Female	0.017	0.013	0.01	0.004
Have children	-0.054	-0.054	-0.069	-0.062
Household income	-0.015	-0.013	-0.03	-0.029
Yrs. of service	-0.086	-0.091	-0.081	-0.089*
Manager dummy	0.068	0.062	0.055	0.062
Small company	0.012	0.009	0.002	-0.001
<i>R</i> <sup>2</sup>	0.025	0.022	0.044	0.062

PREDICTING PERCEIVED PRODUCTIVITY USING FLEXIBILITY POLICIES USING OLS REGRESSION (n = 383)

\**t*-test for item is significant at p < .10 (two-tailed tests).

\*\**t*-test for item is significant at p < .05.

\*\*\**t*-test for item is significant at p < .01.

"Perceived productivity is a number from 1 to 10, in which the respondent described how productive he or she was under current conditions, compared to the most productive work time in his or her life, which would be labeled a 10.

The regression analysis explained up to 7.4 percent of the variation in OC among the biotechnology employees surveyed.<sup>33</sup> While this is modest in terms of explanatory power, it is consistent with other studies that examine the effect of structural variables on organization commitment (Gray 1989; Angle and Perry 1981; Aranya, Kushnir, and Valency 1986; Chusmir 1986). Gray notes that including a measure of job satisfaction in the equation could have increased the  $R^2$ , but in this case as in that study, the purpose was not to maximize the variance explained but to examine carefully an important predictor of OC. Similarly, in these tests and Gray's, neither personal characteristics such as education nor organizational ones such as length of service were reliable predictors. This contradicts other research suggesting these two variables are significantly related to *organizational commitment* (see Marsden, Kalleberg, and Cook 1993; Angle and Perry

<sup>&</sup>lt;sup>33</sup> Note that the adjusted  $R^2$  statistic is 0.054, so the explanatory power of the nonadjusted  $R^2$  statistic could be increased by adding more variables if that were the goal.

1981). Perhaps this is so because average length of service is relatively short in this industry, less than 5 years. Further, this is a highly educated sample; whereas 70 percent of all Americans have earned a high school degree or less, only 12 percent of this sample fit this description. The typical range of variation may be absent, or tenure and education may not matter as much with this population as usability of flexibility-related policies.

In predicting *perceived productivity* (Table 4), the findings are different. Hypotheses 6, 7a and 7b, and 8a and 8b are all supported with respect to *productivity*. All three types of work-family policies are positively associated with higher *productivity*, with or without *control* included. However, the association is greatest with *usable* policies (beta = 0.18, p < 0.01), explaining 4.4 percent of the variance in perceived *productivity* outcomes of individuals. When *control* of time, pace, and place is added, the predictive power of *usability* falls a bit (beta = 0.157, p < 0.01), and *control* is positive but smaller than *usability* (beta = 0.127, p < 0.05). This finding coincides with research findings (e.g., Bailyn 1993) suggesting that providing work-family flexibility not only helps with recruitment and retention but also can help employees become more productive as well. Even if the reverse direction of causality is assumed, that more productive workers are drawn to firms with more flexible and usable policies, firms can rely on a positive association between these variables.

To evaluate hypothesis 5 concerning gender, I tested interaction terms for *female* with each of the independent and control variables in predicting *organizational commitment* and *perceived productivity*. No independent interaction was significant.<sup>34</sup> Separate data runs by gender did not show a sex difference, according to a Chow test.<sup>35</sup> Thus this hypothesis is supported: In similar jobs, men and women do not differ in the relationship of *usable* flexibility to *organizational commitment* and *perceived productivity*.

<sup>&</sup>lt;sup>34</sup> Only one control interaction term, *female* × *education*, was significant, and it was associated with lower levels of commitment. Also, in this model, being female was positively associated with commitment (beta = 0.7, p < 0.01). The interaction of *female* and *years of service* was the only interaction that was associated with *perceived productivity* (negatively). I tested all the equations including marital status, found no significant effects, and dropped it from the analysis. I also examined interactions between marriage and parenting status and gender and family status but found no important effects for these outcomes (complete summary available from the author).

<sup>&</sup>lt;sup>35</sup> The Chow test was insignificant for both outcomes, using the test in Kmenta (1971:370–1). This is not to say that gender is irrelevant, but it is not an important contributor to these outcomes given these variables. In a survey question not reported here, women were 30 percent more likely than men to say that they thought using the policies might hurt their future with the company.

# Discussion

What guidance do these findings give scholars and practitioners? First, perceived usability of flexible work-family policies is important to employees, more so than either the presence of formal or informal policies alone, for the desired outcomes of commitment and productivity. Put bluntly, if employees cannot use the policies, they do not help them, at least for commitment purposes. When adding necessary controls, perceived usability retains its strength. Second, if employees find policies to be usable, they are associated positively with perceived productivity for all employees, male and female. Even the presence of formal or informal work-family policies is significantly associated with higher productivity, although this relationship is stronger where they are perceived as usable. In addition, a related variable, control over time, flexibility, and pace of work, is important in predicting positive levels of commitment and productivity for all employees. The design of work-family programs and work structures and the amount of control employees have over the pace and place of their work are all-important. Although the usable effects are small, they are robust, which suggests that accessible work-family policies may be necessary for knowledge workers to become committed to a firm and to feel more productive.

This study shows the association of work-family flexibility policies with perceived productivity and organizational commitment. Further, it contributes a new concept and measure of perceived usability to the work-family research field, as well as linking usability positively to control of time and work flow.

# Limitations of the Research

One limitation with the study is the self-report nature of the data. Clearly, some workers may have viewed the survey as an opportunity to express their need for flexibility or more accessible flexibility. However, this does not reduce the value of their opinions; in fact, if employees desire more "usable" policies, perhaps companies would benefit from knowing this, and a survey is a relatively safe way to express this concern. In some cases, employees may not feel safe expressing it verbally to a manager. Companies agreed to participate in the study at least in part because they are aware of the needs of this population, as indicated in the introductory quotation, and want to know these opinions. A precisely measurable productivity indicator would have strengthened the study, although none was available in this industry among any of the companies studied.

Because this study is cross-sectional, it cannot demonstrate causality or direction of the impact of these policies; at most, it demonstrates systematic relationships between usable flexible work-family policies and these two outcomes. Given other research findings, it seems unlikely that the most committed and productive workers would choose firms with extensive usable work-family policies—but it is certainly possible and could even be a desirable finding for a firm. This study is also cross-level, which is at once a strength and a weakness (see Rousseau 1985). While I show patterns for a population of individuals, they are not randomly distributed but are grouped by firm, although I added variables with the effect of controls for firm effect. The results are still informative, but caution should be kept in mind in evaluating them. While this study has limitations because of its empirical grounding in the single industry of biotechnology and its focus on professional and technical employees, it is consistent with findings of organizational commitment for different populations.

# Conclusion: Future Research and Policy

Future researchers might craft better measures of productivity in technical and professional jobs and could test the notion of "feeling free to use" certain policies while also measuring formal and informal work-family policies. These tests also could be made with work-family policies more similar to benefits, such as child care centers, subsidies, referral services, and so on. For policymakers, ensuring that employees genuinely have some control over the boundaries of work and the flexibility with which to exercise any legislated rights (such as family leaves) will be important. Also, those evaluating programs need to probe deeply as to whether the policies are actually able to be used by the intended beneficiaries.

This study teases out the relationship between formal and informal policies and adds another level of felt availability to employees. It is in the best tradition of industrial relations and work-family studies to link these two dynamic fields.

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#### APPENDIX: COMPANIES' FORMAL FLEXIBILITY POLICIES

Company	Formal	Informal	Perceived Usability
Small cos. $(n = 18)$	1.54	2.42	1.12
ImmuCo $(n = 25)$	1.92	2.81	1.64
Quattro $(n = 268)$	2.43	2.63	1.49
BioCo $(n = 31)$	1.52	3.24	1.31
GeneCo $(n = 41)$	2.98	3.00	1.74
All companies (avg.)	2.32	3.19	1.50

MEAN SCORES OF COMPANIES ON WORK FAMILY POLICIES (n = 383)

Note that three small companies were combined to make one "small companies" category.