I’LL DO IT TOMORROW
THE LOGIC OF PROCRASTINATION
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Abstract. College students seem especially adept at procrastination. Large percents report that it causes lower quality papers and projects, lower exam scores and, to a lesser extent, late or missing assignments. Using survey data collected from a broad cross-section of students and faculty we argue that procrastination can be modeled as a logical, albeit sometimes inefficient, behavior within a rational choice framework. By looking at differences in perceived costs and benefits across individuals and across circumstances we can predict who procrastinates, under what conditions they procrastinate, and how it might effectively be countered.

Keywords: behavioral economics, procrastination, rational choice

We procrastinate. We procrastinated before reading this article; you probably procrastinated before writing it. College students seem especially adept at procrastination. Excuses involving an ill-stricken relative, usually a grandmother, or a homework-eating dog have become cliché, and generations of college students can recount an experience with that venerable cramming ritual known as the “all-nighter.”

Procrastination has been studied extensively by a variety of social scientists. Past researchers often treated procrastination as a personality trait and some concluded that procrastinators have low self-esteem and attribute their procrastination to character flaws such as laziness or lack of self-control (Burka and Yuen 1983). But recent studies using rational choice models find that what might appear to be irrational on the surface can be a predictable behavior. Dan Ariely has popularized some of this work in his recent best-seller Predictably Irrational (2008).

Within a rational choice framework, procrastination is not an irrational personality disorder; it is a logical, albeit potentially inefficient, behavior driven by a reasoned comparison of perceived costs and benefits. If this is the true, we should be able to predict the types of people and circumstances most prone to procrastination by examining relative costs and benefits they face. And, by changing these perceived costs and benefits, we should be able to change the amount of procrastination that occurs.

In this article, we review past research on the causes of procrastination and develop hypotheses about three main topics: who procrastinates, when procrastination will occur, and how we might limit procrastination. Finally, we test these hypotheses with data compiled from questionnaires distributed to a sample of undergraduates and faculty at a mid-sized university.

Other researchers have tested similar hypotheses and Steel (2007) provides an extensive bibliography. However, our study differs in two important ways. First, most other studies followed a small sample of students enrolled in a particular class. Our survey results track a broader range of students. They also include faculty observations that allow us to compare student and faculty perceptions. Second, while most other empirical studies have looked at procrastination from a psychological perspective, ours examines student procrastination within a more explicit cost-benefit or rational choice framework.

Causes of Procrastination

Why do we procrastinate? Why do we delay? For rational choice theorists, the usual suspects are initial costs that discourage us from starting a task. For example, students who must expend a large, upfront cost to begin a school project may turn to alternative pursuits instead. Nobel-prize winning economist George Akerlof (1991) uses salience to explain this phenomenon. People typically place disproportionate weight on vivid or “salient” events relative to less vivid or “palid” information (Steel 2007). For example, even if scientific tests conclude that Toyotas are reliable, we are unlikely to buy one if our sister complains weekly about the repairs her own Toyota needs. Our sister’s experience does not alter Toyota’s excellent overall record, but its salience probably will
steer us to an alternative brand. The same concept can explain procrastination. The events and emotions of the day are immediate and pressing, those of the future are vague and less vivid. The costs of studying today are salient; the costs of studying later are pallid.

Suppose that developing a well-planned study schedule will cost a student $50 of time and effort, but will be worth a $1 per day in improved academic performance. A rational student should do it. The continuing $1 benefits per day easily will outweigh the one-shot $50 cost over the long run. But suppose that salience adds to the cost of developing the schedule today rather than later. Suppose salience raises the perceived cost of immediate action from $50 to $52. That small $2 difference changes everything. Each day we will reason that waiting until tomorrow to act will reduce our cost from $52 to $50. But if we think we can save $2 by waiting a day and lose only $1 by waiting a day, it always will seem rational to wait. We will procrastinate forever. The salience of today’s pressures drives a wedge between current and future costs and creates systematic behavior that damages our long-run best interests.

Several researchers identify “task aversion” as another potential cause (Ferrari et al. 1997, Scher and Ferrari 1999, Steel 2007, Wolters 2003). While sophisticated models can be developed to derive the concept (Fischer 1999), the intuition is straightforward. In general, we are less willing to do something we do not want to do, so we delay taking action. We look for anything to do except the task we should be doing. Playing one more game of computer solitaire, creating a fantasy baseball team, or even cleaning out the refrigerator all could serve as welcome diversions for an unwelcome task.

For example, what could be less fun than filing income taxes? Although tax forms must be submitted by the same date every year, millions of taxpayers still manage to delay until the last possible minute. For those of us who receive refunds, our procrastination throws dollars down the drain. Every day of delay means the loss of interest we could have earned on those funds. Collectively we sacrificed nearly $1 billion of potential interest in 1988 alone (Parker et al. 1997).

Uncertainty also can create delay. Uncertainty creates the need for upfront and costly planning before a task can be started. In academic contexts, uncertainty about what research topic to choose or what resources will be needed or how much study time should be allocated can throw the most well-intentioned student into a frozen stupor. The same kind of uncertainty arises when shopping for holiday gifts. As psychologist Timothy Pychlyt explains: “You don’t know what you’re going to get for people. You don’t know what they want and even what size to get, so there is a lot of uncertainty and uncertainty is one of those situations that leads to a lot of procrastination. Then you add to that just the kind of crowded parking lots and fights for gifts in the stores. You get something that is very aversive and leads most of us to want to put it off” (Procrastination Nation).

A fear of failure or of making mistakes adds to the problem (Onwuegbuzie 2000, Wolters 2003). We want to resolve all uncertainty before making important, possibly life-altering decisions, but the pressure to make the best possible choice causes many of us to delay making any choice at all. Indeed, we more often procrastinate in the pursuit of important goals than in the pursuit of less-important ones (O’Donoghue and Rabin 2001). In the words of Voltaire, “the best is the enemy of the good.” For example, although investing for the future is a critical economic choice, many of us put it off. Even Harvard professors fall prey to this. Like many institutions, Harvard contributes to faculty retirement plans. However, in the past, Harvard’s contributions would earn no interest until faculty members submitted a form indicating how they wanted monies to be divided among different investment options. Because of the uncertainty, many faculty members procrastinated. Although the paperwork took less than an hour to complete, most junior faculty members who left Harvard during the 1970s never completed it until their final days, thereby sacrificing hundreds of dollars in foregone interest (Akerlof 1991).

Although they differ in subtle ways, each of these theories paints a similar picture. Salience, task aversion, uncertainty, and fear of failure increase the perceived costs of starting a project and lead to delay.

Data

To measure the extent of procrastination and to test our hypotheses we collected data from a broad group of students and faculty at a mid-sized university. With the approval of instructors, we asked students in a cross-section of courses to complete questionnaires during class time. This gave us an almost 100 percent response rate. More importantly, we got data from student procrastinators who might otherwise never have gotten around to responding. We also distributed faculty questionnaires to mailboxes in every department.

In total, 200 student and 82 faculty questionnaires were completed and returned. The characteristics of student respondents are generally consistent with the student body as a whole in terms of gender (primarily female), academic class and major. Among faculty respondents, science instructors are overrepresented; however we find no significant differences between their responses and those of faculty from other areas. Copies of the questionnaires and detailed results are available upon request.

Who Procrastinates?

The oft-repeated statistics are that 95 percent of students procrastinate at least occasionally (Ellis and Knaus 1977) and close to 50 percent do so with some consistently (Solomon and Rothblum 1984). We find similar results.

Our questionnaires measured three different possible outcomes of student procrastination. We asked if procrastination ever lowered the quality of a paper or project (low quality), if it ever caused students to turn in assignments late or not at all (turn in late), and if it ever resulted in lower exam scores (lower scores). Students had five possible responses: always, usually, sometimes, rarely, and never.

As expected, the effects of procrastination are widespread. Only a single student claimed “never” to be affected by procrastination in any of the three categories and 42 percent admitted that they “usually” or “always” were affected in at least one of the three. About one-third admitted that the quality of their papers/projects usually or always suffered, and one-fourth said the same about their exams. Only about 5 percent of respondents usually or always turned assignments in late as a result of procrastination.

We then divided students by gender, by type of major (business, education, science, arts, social science/humanities) and by academic year, compared their answers for each of the three questions (low quality, turn in late, low scores), and used a chi-square test to check for statistically significant differences in the distribution of responses. Because the data are more qualitative than quantitative, using ANOVA to compare mean responses is statistically questionable. The probabilities that the observed differences in responses could be found by chance are listed in table 1.

Procrastination patterns are remarkably consistent across all types of students. Some have asserted that males procrastinate more than females (Senecal et al. 1995), but we find only limited support for this. We do find that males are significantly more likely to turn assignments in late as a result of procrastination, but there are no significant male-female differences in terms of lower paper quality or exam scores. We also find no significant differences in the responses of students in different academic years or students with different types of majors.

We then checked for differences between varsity athletes and non-athletes and between employed and non-employed students. Athletes and employed students might plausibly find procrastination to be more costly. They...
might need to complete tasks quickly to avoid conflicts with their practice/game schedule or their work schedule. However, the time constraints these students face might also raise the benefit of delay. They might need to postpone academic projects to keep up with sport and work obligations. Apparently these effects offset one another because we find no significant differences in their responses (table 1).

We next compared students with high grade-point-averages (GPAs of 3.4 or higher) to those with lower grade-point averages (GPAs of 2.8 or lower). Several studies have found that high levels of procrastination are associated with poor academic performance (Rothblum et al. 1986; Senecal et al. 1995; Tuckman 1998). Students with lower GPAs may take their classes less seriously and, therefore, see less cost to procrastination. They also may be more likely to suffer from task aversion and a fear of failure when faced with the need to study or complete assignments (Orpen 1998).

Our results agree. Students with lower GPA’s were significantly more likely to report lower quality work, late assignments, or lower scores due to procrastination (table 1). Surprisingly, GPA was not related to procrastination in other areas. Students with high GPA’s were just as likely as those with low GPAs to report procrastination caused problems in non-academic facets of their lives. Perhaps talented students earn higher grades not because they procrastinate less, but because they can succeed in spite of it.

Do faculty members agree? True to our can-tankerous reputation, faculty respondents were more critical of student procrastination than were students themselves. In each of the three categories faculty were significantly more likely to report problems than were students. Students and faculty also disagree about the types of problems that occur most commonly. Consistent with prior research (Rothblum et al. 1986), students claimed the most problems with the quality of papers and projects. However, faculty responses tilted more to lower exam grades. More than one-fourth of students claimed that procrastination rarely or never caused lower exam scores, but only three of the 82 faculty respondents concurred. Are student procrastinators fooling themselves, or are faculty members misjudging student effort?

Finally, we tried reclassifying student and faculty responses. We combined “always” and “usually” responses and also combined the “rarely” and “never” responses. We then recalculated the chi-square tests of significance using this modified response data. Although the chi-square percentages changed somewhat, the pattern of significant vs. non significant differences remained unaffected.

**TABLE 1. Who procrastinates: Are there differences across groups?**

<table>
<thead>
<tr>
<th>GROUP</th>
<th>LOWER QUALITY</th>
<th>TURN IN LATE</th>
<th>LOWER SCORES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>.369</td>
<td>.043*</td>
<td>.431</td>
</tr>
<tr>
<td>Type of major</td>
<td>.992</td>
<td>.505</td>
<td>.760</td>
</tr>
<tr>
<td>Academic year</td>
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<td>.468</td>
<td>.831</td>
</tr>
<tr>
<td>Employment status</td>
<td>.584</td>
<td>.714</td>
<td>.550</td>
</tr>
<tr>
<td>Athletic status</td>
<td>.676</td>
<td>.606</td>
<td>.312</td>
</tr>
<tr>
<td>High/low GPA</td>
<td>.004*</td>
<td>.006*</td>
<td>.001*</td>
</tr>
</tbody>
</table>

*Differences in group responses are statistically significant at 95 percent confidence level.

WE DO FIND THAT MALES ARE SIGNIFICANTLY MORE LIKELY TO TURN ASSIGNMENTS IN LATE AS A RESULT OF PROCRASTINATION, BUT THERE ARE NO SIGNIFICANT MALE-FEMALE DIFFERENCES IN TERMS OF LOWER PAPER QUALITY OR EXAM SCORES.

**When Do Students Procrastinate?**

Because costs and benefits of procrastination vary across types of assignments, behavior should vary as well. For example, to the extent that task aversion matters, procrastination should be less likely in classes that students enjoy (Schraw et al. 2007; Senecal et al. 1995). Similarly, students should procrastinate less in classes related to their chosen major. Because such classes are more enjoyable, procrastination should be less beneficial. Also because the last minute. They praised procrastination as the most efficient approach to learning, thought that procrastination had a positive impact on the quality of their work, and expressed pride at their ability to produce under pressure.

Our student respondents admit that procrastination damages their academic performance, but that does not prove that procrastination needs to be fixed. If students choose to procrastinate they must expect that the benefits they will receive (increased current leisure, task avoidance, etc.) will outweigh any future costs.

Pychyl has observed student behavior by using pagers to periodically check what students are doing and if any assignments are being delayed. He finds that, when an assignment is due on Friday, many students say on
Monday that they lack the creativity or that they work best under pressure. However, when those same students are contacted Thursday night, they busily are working away. None voluntarily spout, “I’m glad I waited until now. I work so much better under pressure” (Procrastination Nation). It is as if such students have multiple “selves” in which the preferences of their current selves are inconsistent with the preferences of their future selves (O’Donoghue and Rabin 1999). Although students are aware of the assignment on Monday, they intentionally wait. Their current selves value their own well-being over the well-being of their future selves and make choices that do not always maximize their long-run best interests.

Similar situations occur in other contexts. For example our evening self might carefully set an alarm clock only to be overruled by our morning self that decides to sleep through it. Or, our initial self wants to eat a single bowl of ice cream but gets overruled by a later self who, after finishing one bowl, wants a second. When we expect such dilemmas to occur, our rational response is to engage in what Schelling (1984) has termed anticipatory self-command. We might enlist a spouse to make sure we get out of bed when the alarm rings, even if we later insist we want to sleep longer. Or we might ask a friend to hide the ice cream, even if we later insist we want more. We try to ensure that a future self cannot engage in behavior that seems rational at the moment, but is harmful in the long run.

Do students want to “fix” procrastination? Most do. More than 50 percent disagree with the statement that “procrastination is just part of the college experience and is not something that needs to be dealt with.” Less than 20 percent agree. Students with lower GPA’s are the most likely to disagree, although the difference is significant only with 80 percent confidence (Table 2). The low-GPA students who suffer the most are more likely to see procrastination as a problem.

How should faculty respond? Helping students overcome procrastination should be part of helping them develop the skills needed for career success (Ferrari and Scher 2000). How can we do it? Allowing procrastinators to fail might be a good approach, but most faculty members do seek ways to limit student procrastination. In our rational choice framework this means adopting policies that change the perceived costs and benefits: policies such as increasing the weight of an assignment and/or imposing intermediate deadlines.

Placing greater weight on an assignment raises the cost of poor performance and, therefore, the cost of procrastination (Fischer 1999). Some studies find that grade incentives and similar doomsday threats have little impact on procrastination (Lamwers and Jazwinski 1985; Schraw et al. 2007), but others disagree (Tuckman 1999). In our surveys students overwhelmingly agree that they are less likely to procrastinate on assignments that have a large impact on their grades, and some faculty respondents indicate that they exploit this to limit procrastination.

However, for students and faculty alike, imposing intermediate deadlines usually is the strategy of choice. By dividing an assignment into smaller tasks or “bite-sized-pieces,” students are less intimidated because these smaller tasks become more manageable and easier to perform. These smaller deadlines also create less uncertainty (Fischer 1999). Not only does this make completing a task appear more attainable, it limits the procrastinator’s ability to build up a work load to deal with later (Tuckman 1998). In effect, by cutting the cost of beginning a project, procrastination becomes less beneficial.

Although Conners (1995) has tried eliminating deadlines with some success, he seems to be the exception. Others find that intermediate deadlines do limit procrastination (Lamwers and Jazwinski 1985; Sweeney 1979). Ariely reports experimenting with differing deadline policies in a course that required three papers. In one section, students were told that all three papers were due at the end of the semester and in a second section deadlines were evenly spaced throughout the semester: the first paper was due after the fourth week of class, the second after the eighth week and the third after the twelfth week. In a third section students were allowed to contract any set of deadlines they wished. Ariely found that students in the section with instructor-set intermediate deadlines did the best, and students given only a single end-of-the semester deadline fared the worst (112–17). Externally imposed deadlines can, and often do, improve performance.

We find similar results. Most students disagreed with the statement “I prefer no intermediate deadlines so that I can start and complete assignments at my own pace” and, consistent with the notion of anticipatory self-command, wanted instructors to impose intermediate deadlines. Students with low GPAs were especially likely to oppose no-deadline regimes and support instructor-imposed ones (Table 2); perhaps because they realized that they were more at-risk for the consequences of procrastination. Faculty respondents apparently sympathize and most indicated that they did, at least sometimes, impose such deadlines to reduce procrastination.

**Conclusion**

Procrastination impacts almost everyone. Although countless students repeatedly swear they will never procrastinate again, they invariably do. They fall prey to salience, task aversion, and uncertainty that raise the cost of starting a project. This creates delays that cause lower quality papers and projects, lower exam scores and, to a lesser extent, late or missing assignments.

However, although procrastinators often act contrary to their own long-run best interests, much of their behavior fits the predictions of a rational choice model. Students with low GPAs who are likely to find studying more costly and less beneficial report the most problems with procrastination. And, as expected, problems with procrastination are less common when procrastination is costly: namely in courses that students enjoy, major courses and in group work.

Although they freely choose to procrastinate, both students and faculty see it as a problem. In an attempt to foil their future selves, many students want faculty to impose intermediate deadlines that alter costs and benefits and bridle their procrastination. Students for whom procrastination is the most costly, those with low GPAs, are the most likely to favor such constraints. Most faculty members do try to reduce student procrastination and do report limited success. Nonetheless, procrastination remains pervasive, even with your authors. Happily we do plan to procrastinate less. We’re going to do it tomorrow.

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**TABLE 2. Procrastination as a problem: High versus low GPA students**

<table>
<thead>
<tr>
<th>GROUP</th>
<th>LET IT BE</th>
<th>PREFER NO DEADLINES</th>
<th>PREFER IMPOSED DEADLINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>High/low GPA</td>
<td>.160</td>
<td>.006*</td>
<td>.001*</td>
</tr>
</tbody>
</table>

*Differences in group responses are statistically significant at 95% confidence level.*
REFERENCES