Case Study: Applying the Theory of Planned Behavior as Interventions to Increase Sponsored Project Proposal Submissions from Liberal Arts Faculty

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Abstract

In the current economic climate, many colleges and universities face similar challenges: the need to increase external sponsorship for research activities and the need to benefit from additional indirect cost recovery. Preparing funding proposals for submission to sponsors is a faculty behavior that can be modified by applying behavioral theory to develop and institute interventions for shaping the desired behavior. The Theory of Planned Behavior readily lends itself to research management methods and techniques that target critical factors influencing intentional behavior. This case study explains the theoretical rationale for the behavioral interventions instituted, describes the measures and methods, and reports on the successes achieved over 10 years.

Keywords: proposal development, research administration, planned behavior

Introduction

The effects of economic turmoil have not spared many institutions. Tough economic times call for prudence in reducing costs, as well as creativity in increasing revenues. An organization's ability to move direct costs, such as faculty salaries, to sponsored projects, as well as to increase recovery of indirect costs, is critically dependent upon a principal investigator's intentional deliberate behavior to write and submit funding proposals. Senior officials in education, industry, and government

represent the group of research administrators most often charged to develop policies and devise strategies for the increase of funding proposals.

Ajzen's Theory of Planned Behavior (TPB) is a powerful model with practical application to a variety of situations to predict and influence human intentions to perform a range of desirable behaviors (Ajzen, 1991). Evidence from narrative and meta-analytic reviews support its efficacy as a predictor of intentions and behavior capable of explaining 20 percent or more of the variance in prospective measures of actual behavior (Armitage & Conner, 2001). This theoretical model is particularly applicable to a variety of intentional human behaviors that are of importance to research management.

Theoretical Model

The Theory of Planned Behavior is a derivative of Ajzen and Fishbein's earlier Theory of Reasoned Action, in which they tried to estimate discrepancy between a person's attitude toward a behavior and the actual performance of that behavior (Ajzen & Fishbein, 1980). Subsequent research indicates that behavior may not be voluntary or under control. Recognizing that human behavior can be both deliberative and planned, the initial theoretical model was refined to include the element of perceived behavioral control and published as the Theory of Planned Behavior (Ajzen, 1991).

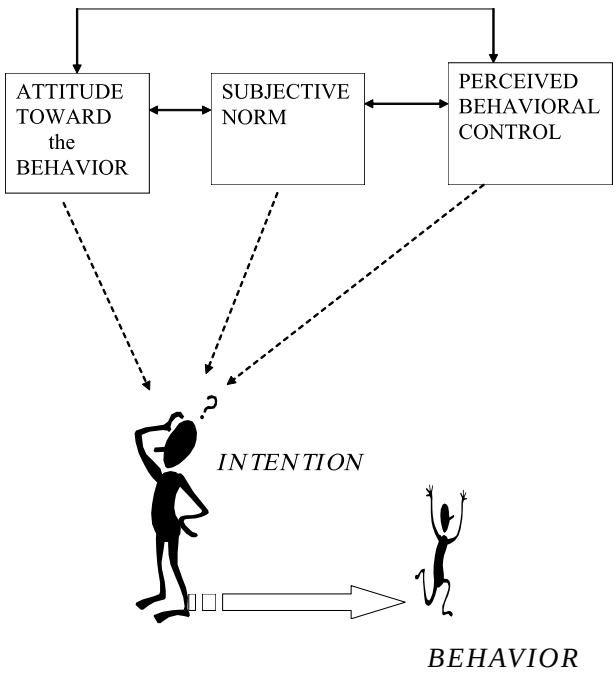

Figure 1: Theory of Planned Behavior explains a significant portion of variability in deliberate behavior (Ajzen, 1991).

The theory explains that the best predictor or immediate determinant of a behavior (i.e., whether a faculty member will prepare and submit a funding proposal) is the *intention* to act or not to act. This critical decision point of intending to act is influenced by three factors:

1. *Attitude toward the behavior*, which reflects the individual's evaluation of the behavior, its personal value and desirability, and the perceived benefits or rewards for performing the behavior.

2. *Perception of subjective norm:* Intentionality is also influenced by the individual's perception of the social pressure to execute, or not to execute, the behavior.

3. *Perceived control over the behavior,* which is a person's perceptions of his or her ability to perform the behavior. An individual's perceived control is influenced by experiences with the behavior and ability to overcome associated obstacles.

TPB predicts that a potential principal investigator (PI) is more likely to intend to pursue external funding for projects, and will actually follow through to write and submit a funding proposal, when that person:

a. believes that submitting funding proposals is a desirable and valued behavior;
b. sees other similar people successfully writing and submitting proposals; and
c. perceives they are able to write and submit proposals, that obstacles can be overcome.

Case Context

The University

The University of Alaska Fairbanks (UAF) is located in the interior of Alaska, approximately 75 miles from the Arctic Circle. UAF is the main campus, and the research university, of the statewide University of Alaska system; UAF is the only doctoral-granting institution in the State of Alaska. UAF was originally founded in 1917 as the Agricultural College and School of Mines. Today, UAF is America's northernmost Land, Sea, and Space-grant institution, and in 2009 was named as one of the West's best colleges by the Princeton Review. UAF holds an RU/H Carnegie classification, and research expenditures at UAF have increased substantially from $56.4 million in FY97 to over $107 million in FY09. UAF ranks first out of 50 universities in the amount of research funds awarded from the National Science Foundation (websites of UAF and NSF).

The College

This context differs dramatically at UAF's College of Liberal Arts (CLA), whose faculty tend to view the College as a predominantly undergraduate teaching institution. This derives from the fact that the College provides a broad liberal arts undergraduate education with strengths in circumpolar teaching and research emphasizing Alaska Native peoples and languages; the College also bears a heavy general education service mission to provide over 68 percent of courses that meet core curriculum requirements for all UAF baccalaureate degrees. However, the College of Liberal Arts is one of the largest colleges in the University of Alaska statewide system, and is comprised of nearly 400 employees that include over 150 potential principal investigators, who are also all members of the faculty union, United Academics. The College's 28 academic units offer 20 undergraduate degree programs, 11 master's degree programs, and 4 doctoral programs.

Problem Statement

Given the College's self-concept as a teaching college, and institutional identity as a service provider to the other degree programs, there was very little sponsored project activity occurring prior to the year 2000, as can be seen in Table 1.

Table 1. Summary of sponsored project effort and success prior to applying interventions based on the Theory of Planned Behavior. A five-year average was calculated using Microsoft Office Excel 2007 averaging function: μ (average number of proposals) = 50; μ (dollars sought) = $4,435,416.67; μ (new awards) = 14.8 (rounded down to 14 whole awards); μ (new dollars awarded) = $698,958.33; μ (ICR to college) = $39,204.

Fiscal Year	New Proposals	Dollars Sought	New Awards	Dollars Awarded	ICR to college
FY96	64	$3,600,000	19	$ 120,000	$36,100
FY97	57	$4,100,000	16	$ 140,000	$33,520
FY98	60	$6,750,000	16	$1,600,000	$24,638
FY99	21	$2,200,000	5	$ 95,000	$46,620
FY00	48	$5,800,000	19	$1,750,000	$59,128

In the Spring of 1999 the Dean of CLA realized that the College needed "to get this turned around." To meet that challenge, he implemented a plan to launch an Office for Research Development that included assigning one unrepresented faculty (this author) to serve as director, with two years to "prove up" by showing positive change and momentum. There was no provision for additional staff or budget beyond the director's salary and benefits. Two initial goals were set: increase recovered indirect costs to the College and increase sponsored project activity to 10% of College-wide overall faculty capacity.

Methods and Measures

Measures

The situation was approached from a cognitive psychological perspective, since this was a well-defined problem. All the necessary information was spelled out in the problem statement and there were clear criteria to determine when the goal had been achieved. As shown in Figure 2, a working-backwards heuristic via means-end analysis was used to break down the difference between the initial state and the goal state, to identify the most important differences, and then to find an operator that would tend to reduce that difference (Solso, MacLin, & MacLin, 1998).

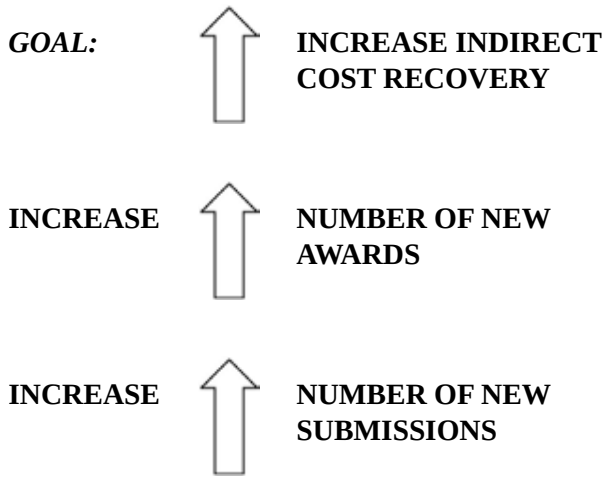

Figure 2: A working backwards heuristic via means-end analysis was used to break down the steps between the initial state and the goal state, to identify stages where change operators could have a positive impact.

Indirect costs are enumerated as the total dollars distributed to the College of Liberal Arts in each fiscal year as the unit's proportional share of the institution's facilities and administration cost recovery and distribution procedures for UAF-sponsored programs (UAF OSP website).

Numbers of new awards are counted in the fiscal year in which they are awarded regardless of fiscal year in which the project is proposed. Depending on

timing of submission relative to federal review cycles, and the number of revisions and resubmissions that may be requested, the award event may lag the initial proposal event by up to 3 years.

New dollars awarded reflects the total dollar value of the new award that is enumerated in the fiscal year of the initial award.

Number of new proposals/submissions is the number of external funding proposals submitted in each fiscal year. In this particular case, external is broadly interpreted to mean external to the College of Liberal Arts, and includes university and statewide system internal competitions, many of which have federal sponsors such as Alaska EPSCoR/NSF and Alaska INBrE/NIH.

New proposals are written by eligible principal investigators, who are most often faculty, but may also be graduate students or staff, depending on the sponsor's eligibility guidelines. The most critical assets for the conduct of research and sponsored projects are the time and effort expended by faculty, whose expertise and interests match the sponsor's program requirements (Ebong, 2001). Universities and colleges typically identify teaching, research, and service as the components of their mission and the prime responsibility of the faculty (Darling & Hensley, 1992). Since a university's most important asset to achieve the mission is its faculty, the number of faculty represents the capacity available to achieve the mission. How the primary objectives of the institution are met is significantly dependent upon how faculty effort is allocated among the tripartite mission components. Since most other resources are fixed, particularly at a publicly funded institution, faculty and staff time are the only resources that can be changed significantly to improve performance (Plater, 1995; Sink, 1985).

Developing sponsored projects in a primarily academic unit requires understanding the distribution of faculty resource capacity. In this case, while the total number of faculty is tallied, the total number of faculty workload units available for allocation was a more useful measure of resource allocation (see Table 2).

Methods

Within the constraints of a one-person office and no additional budget, interventions were designed and implemented to deliberately target the three factors that most influence the critical decision point:

1. ***To change attitude toward the behavior using public and private rewards:*** Since attitude toward a behavior reflects the individual's evaluation of the behavior, its personal value and desirability, and the perceived benefits or rewards for performing the behavior, the following interventions were implemented.

Table 2. Summary of the allocation of the college's faculty resource capacity to the tripartite mission components. Note that the increase in sponsored activities did not reduce teaching efforts; teaching allocation actually increased. The goal was to preserve teaching capacity, reduce service commitments, and to increase sponsored projects by converting unsponsored research activities into sponsored projects.

Academic Year	Capacity # Faculty	Capacity # WLUs	Effort % research	Effort % sponsored	Teaching % WLUs	Service % WLUs
1999 - 2000	111	2855.5	22.19%	3.41%	-	-
2000 - 2001	111	3248.5	23.21%	5.61%	-	-
2001 - 2002	111	2858.5	22.25%	4.44%	-	-
2002 - 2003	139	3732.5	21.09%	5.32%	-	-
2003 - 2004	141	4097.0	16.0%	5.0%	46.0%	27.0%
2004 - 2005	143	4250.0	18.0%	4.0%	50.0%	25.0%
2005 - 2006	136	4026.0	19.0%	7.0%	47.0%	26.0%
2006 - 2007	121	3722.0	23.0%	6.0%	47.0%	24.0%
2007 - 2008	121	3722.0	23.0%	6.0%	47.0%	24.0%
2008 - 2009	136	4213.2	27.0%	11.0%	54.0%	19.0%
2009 - 2010	130	3602.0	28.0%	8.0%	55.0%	18.0%

WLUs = faculty workload units Effort = % WLUs allocated to the activity

a. Monthly research newsletter

A monthly, one page, double-sided, black & white research newsletter was launched that listed every proposal submitted by PI name, and every new award. This was distributed to the College, and at the monthly Chairs' Council, the proposing departments and faculty were individually and publicly thanked for making the effort and congratulated for their success.

sample proposal entry:

PSYCHOLOGY
(named person) NSF
First Annual Televideo Conference of the Arctic: Sex and Culture
Behavioral Science Research

sample award entry:

ALASKA NATIVE LANG CTR
$ (named person) $397,328 National Science Foundation
Alor-Pantar Languages: Origins and Theoretical Impact (Euro-BABEL)

b. “Spiritual bouquets”

Successful leadership involves encouraging the hearts of others (Custer, 2009). To send a message to the PI that would speak to the human spirit, saying that “you are valued and your efforts are appreciated,” floral note cards were obtained suitable for either gender. At the end of every month, faculty who prepared and submitted a proposal of any size and to any sponsor received a personalized handwritten note card thanking them for their efforts and wishing them continued success in their research and scholarship.

Similarly, when a proposal was funded, another handwritten card, including a note from the Dean, was sent to the PI. Academic life can be busy, tough, and often just plain draining, so when something good happens, like a proposal being funded, it’s something to get excited about and to celebrate. The intent of the notes was to let the faculty member know that the institution, and the Dean, have heard the good news, care about the success however large or small, and are celebrating along with the faculty PI.

Similarly, when a project was not funded, the disappointment was shared. The focus is on rewarding the desired intentional behavior (prepare and submit proposals) not necessarily on the outcome (grant funded or not). This is particularly important when a faculty has invested considerable time and effort to write a proposal. A follow up note of encouragement was sent out to let faculty know their effort was appreciated, that there is confidence that an appropriate sponsor will be found for their important work, and that their project will be kept in mind as new opportunities become apparent.

c. Public recognition via public display

A large wall-mounted locked display board is in the main hall at the entrance to the Dean’s suite. This is an area of high foot traffic by all UAF students, parents, guests, and donors. From the end of May until the beginning of September, the display showcases College of Liberal Arts sponsored projects for that year. The display includes a note of thanks and praise from the Dean, as well as graphical presentation of progress on key metrics. Each year the display is organized around a theme, such as gardening. At the time of this writing, the grants manager had a proposal funded that would convert this bulletin board to an electronic bulletin board, allowing for substantial additional content, including audio and visual.

d. Dean’s public recognition (reception and certificate)

After a change of college administration, the new Dean became aware of a small pot of Dean’s discretionary private money and was convinced to

hold a faculty appreciation reception during Academic Excellence Week in the Spring. Initially, the faculty were invited to a recognition tea with home-baked cookies in a large classroom. Their behavior was revealing, and included tentative peeking in the doorways and asking each other what this was all about. As faculty awareness and productivity grew, receptions were moved to the campus pub on a Friday afternoon with high-end hors d'oeuvres paid for with private monies and a no-host bar (total cost less than $300). Among the various recognitions for teaching excellence and scholarship, such as publishing a book, the Dean also gave out a certificate of recognition to each faculty member who had received a new grant during the previous12 months. The bulletin board display also includes an encouraging word from the Dean.

2. To change perception of subjective norm

Since intentionality is also influenced by the individual's perception of the social pressure to execute or not to execute the behavior, the following interventions were implemented:

a. Welcome letter for new faculty and new department chairs, with tips for encouraging faculty to prepare and submit funding proposals.

Faculty Senate policies specify that academic department chairs will be elected from the faculty. The College has 28 elected department chairs, of whom approximately one-third in any given year are new to the role. Each newly elected chair receives a congratulatory letter that includes:

- welcome to the new role and where to find description of department chair duties
- a brief paragraph on what the department chair signature means when signing a sponsored project proposal transmittal form
- articulation that sponsored projects are a vital component of the discipline, of developing junior faculty, growing the program, and providing another revenue source
- "attached are a few articles that previous chairs have found helpful"

This letter also functions as the cover letter to a packet of helpful articles assembled for this purpose (Boyer, 2001; Gordon, 2004; Sterner, 1999).

b. College-wide statistics regularly published in the newsletter

Each monthly issue of the college research newsletter also features year-to-date statistics in one column on the front page. Under the image of an enthusiastic and encouraging screen bean, the data report number of new

proposals submitted, new dollars sought, new awards received, new dollars awarded, and the College's recovered indirect costs. The data also include the number of sponsored projects on which the college is a collaborator, as well as that total dollar effort to the university. Lastly, the data include the quarterly summary of the College's restricted funds: number and type of contracts, as well as total revenue.

c. Faculty workload allocation profile

Near the beginning of the Spring semester, at a College-wide meeting of the Chairs' Council, each department chair is presented with a graphic depiction of the College's overall faculty workload allocation trend for the previous six academic years (such as enumerated in Table 3), as well as their own individual departmental trend for the same period. These serve as a point of discussion between the Dean, who assigns the faculty workloads, and the chair, who recommends a faculty member's proposed workload to the Dean. In the past 10 years, four different deans have lead this discussion; however, the consistent message has emphasized the goals of preserving teaching capacity while simultaneously converting more scholarly work to sponsored projects.

3. To change perceived control over the behavior

Since perceived behavioral control is the person's perceptions of his or her ability to perform the behavior, and with knowledge that an individual's perceived control is influenced by experiences with the behavior and belief in an ability to overcome associated obstacles, the following interventions were implemented.

a. Wrote Grants for faculty development efforts

To avoid deserved criticism of "do as I say but not as I do," the Director wrote a successful President's Special Projects fund grant to support the College of Liberal Arts' Academic Researchers Maximizing Yields (A.R.M.Y.) project. In addition to supporting a local daylong grantsmanship workshop, the grant supported the purchase of over 100 copies of a how-to grants manual (Bauer, 2001; 2003). Each participant at the workshop received a copy of the manual, as did each department. A second successful funding proposal permitted two substantial orders, and consequently each newly hired faculty has received a personal "Welcome!" copy of the manual. Tucked into the new faculty's copy is a bookmark from the Office of Research Integrity (IRB/IACUC contacts), and business cards of the college proposal development specialist, as well as the Associate Dean to contact for assistance in getting started or to answer additional questions about the process.

b. Resources for individualized study

The CLA Research News contains at least four current websites for individualized study or online tutorials. The basic ones include: UAF's Office of Sponsored Programs page for "How to Write a Proposal" (UAF OSP website); the National Science Foundation's link to "How to Prepare Your Proposal" (NSF website); the U.S. Department of Health & Human Services link to helpful tips for "Writing Your Application" (US DHHS website); and various online tutorials, such as The Foundation Center's, "Proposal Writing Short Course" (The Foundation Center website). Each site is prescreened for relevancy of content to liberal arts faculty before being published.

c. Administrative support

The number of new proposals and new awards gradually increased to the point where the faculty's need for administrative support exceeded the capacity of a one-person office. At this same time, the University of Alaska successfully competed for a third-phase NSF/EPSCoR (Experimental Program to Stimulate Competitive Research) award that included a focus on building capacity in social science research (Alaska EPSCoR, EPS-0701898). Since the majority of the social sciences at UAF are housed within the College of Liberal Arts, so too would be the administrative burden resulting from this capacity-building effort. NSF Award #EPS-0701898 included partial support for a Grants Management Assistant, based centrally in the UAF College of Liberal Arts Dean's office, to support the growth in social science research. The additional full-time technical support has been integral to the successes reported here.

Concomitant with the NSF/EPSCoR award, the fourth International Polar Year (IPY) launched a massive international research effort estimated at over $1.5-billion and involving 63 nations. In the U.S., the National Science Foundation alone awarded 389 IPY research grants for nearly $160 million. Of those, 122 projects involved activities in Alaska, many of which were led by faculty from the University of Alaska. Of these, five awards totaling over $1.5-million were based in the UAF College of Liberal Arts. Moreover, in 2009, UAF faculty successfully competed for four federal stimulus awards (ARRA funding). The increasing volume of proposals and awards, and the increasing complexity of large international collaborative projects, necessitated upgrading the assistant position to Grants Manager.

Results

One serendipitous benefit is improved timeliness of award letter receipt. Faculty began bringing in their award letters almost as soon as they receive them because they wanted to be on the list to be recognized at the Spring reception, the monthly newsletter, and the Summer public bulletin board.

Table 3. Summary of sponsored project effort and success after applying interventions based on the Theory of Planned Behavior. A ten-year average was calculated using Microsoft Office Excel 2007 averaging function: μ (average number of new proposals) = 56 (56.2 rounded down to 56 whole proposals); μ (new dollars sought) = $12,638,678.90; μ (new awards) = 26 (26.6 rounded down to 26 whole awards); μ (new dollars awarded) = $1,861,198.10; μ (ICR to college) = $147,491.96.

Fiscal Year	New Proposals	Dollars Sought	New Awards	Dollars Awarded	ICR to college
FY01	39	$ 8,225,000	19	$7,100,000	$ 96,431
FY02	37	$ 3,800,000	28	$2,800,000	$110,954
FY03	59	$ 9,300,000	23	$ 387,793	$105,831
FY04	56	$36,800,242	27	$ 789,226	$147,929
FY05	78	$30,296,876	32	$ 422,254	$178,512
FY06	74	$ 8,248,992	49	$2,252,243	$141,720
FY07	66	$10,243,324	14	$1,153,541	$ 86,936
FY08	57	$ 5,308,933	34	$1,797,568	$170,876
FY09	40	$ 8,354,417	17	$ 732,455	$227,770
FY10	56	$ 5,809,005	23	$1,176,901	$207,958

As can be seen in a comparison between Table 1 and Table 3, the average annual number of new proposals increased by 10 percent; however, faculty were now pursuing much larger funding proposals, and the average annual number of new awards has nearly doubled; indirect cost recovery to the College has reached historic highs.

As seen in Table 2, the goal of increasing the overall College capacity allocated to sponsored projects to 10 percent or greater took several years to achieve and was finally realized in academic year 2008-2009. As also seen in Table 2, teaching capacity was not only preserved but actual teaching effort increased from an overall 46 percent faculty effort allocation to an overall 55 percent. The leadership of a strong dean contributed to the increase in teaching capacity alongside an emphasis on research mission and necessary reduction in faculty service obligations.

Discussion

As predicted by the theory of planned behavior, management interventions deliberately targeted to address the critical factors that influence intentional behavior have been successful. The goal of increased indirect cost recovery to the College continues to be achieved, necessitating modifications to the annual targets. The goal of increasing overall College capacity allocated to sponsored projects was achieved more slowly and is being sustained at a productive level. The goal of preserving teaching capacity has been reached, and overall teaching capacity has increased.

Conclusion

In the current economic climate, many colleges and universities face similar challenges. All need to increase external sponsorship and to benefit from additional indirect cost recovery. The theory of planned behavior readily lends itself to management methods and techniques that target the critical factors that influence intentional behavior. Such methods may be implemented readily in a wide variety of research settings; however, the particular interventions developed will differ according to the resources and opportunities of the institution and the particular needs of its researchers. As has been found by others who study researcher behavior (Cole, 2007), this case illustrates that understanding the research faculty's intentional behaviors is critical to the success of institutions that want to achieve university research missions, to support research and new faculty, and to expand the knowledge in all disciplines in society.

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