

The Effectiveness of Techniques in User Compliance of IT Policy

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Abstract

In the field of information systems, much work has been done with regard to user compliance, and with policy creation. However, very little literature exists on the link between policy revision and users' compliance. Given that mobile data connections have reached and in some cases surpassed current land broadband speed, any user with a modern mobile device capable of 3G or LTE connections can simply circumvent an enacted acceptable use policy on a corporate network. This study adapts the theory of planned behavior and draws from sociological compliance-gaining techniques in order to further understand what techniques managers could use in order gain full compliance. The results are analyzed and the efficacy of various techniques evaluated.

Introduction

With the advent of broadband speeds over wireless infrastructure accessed in the form of mobile devices, an organization's ability to effectively implement policy in which to control what a user accesses during work hours has become increasingly difficult. While organizations retain control over their respective internal information systems infrastructure, they effectively have no way to govern a third party device that could cause for a distraction and loss of productivity. Given how ubiquitous and mobile devices are, and the rate at which mobile data speeds are gaining ground, managers find new challenges with their employees when it comes to productivity issues and the amount of distractions their employees encounter every day.

With these considerations in mind, managers must turn to alternative strategies in order to engage employees who would otherwise seek distractions from their work day. In light of this change in how users access what would be otherwise restricted content on the company's infrastructure, it is important to examine the psychological and sociological aspects of what managers can do to incentivize their employees. This study looks at the Theory of Planned Behavior (Ajzen, 1991) and takes perceived behavioral controls and casts them in the light of compliance-gaining techniques (Marwell & Schmitt, 1967a).

Literature Review

Theory of Planned Behavior

The theory of planned behavior (see Figure 1) is an extension of the behavioral work done previously with the theory of reasoned action (Ajzen, 1991; Madden, Ellen, & Ajzen, 1992). In the extended model, the theory posits that there exist several independent variables of a dependent behavior variable, including attitude, subjective norm, and most notably, perceived behavior controls.

Attitude: In the theory of planned behavior, there are three factors that affect behavioral intention, including attitude. A person's attitude toward the behavior refers to their psychological perception of the intention to act based on behavior. This along with subjective norm made up the original theory of reasoned action that Ajzen has since extended to the theory of planned behavior.

Subjective Norm: Subjective norm is another independent variable identified in the theory of planned behavior, and also part of the theory of reasoned action. Subjective norm refers to the body of people around the user, and how their attitudes, actions, and experiences influence the user (Pelling & White, 2009).

Perceived Behavioral Control: Lastly, the theory of planned behavior incorporates a new aspect not included in Ajzen's original theory: perceived behavioral control. Here, perceived behavior control is that which is apparent to perception and subject to being modified. This aspect of the model will be examined in detail when looking at methods to gain user compliance with policy.

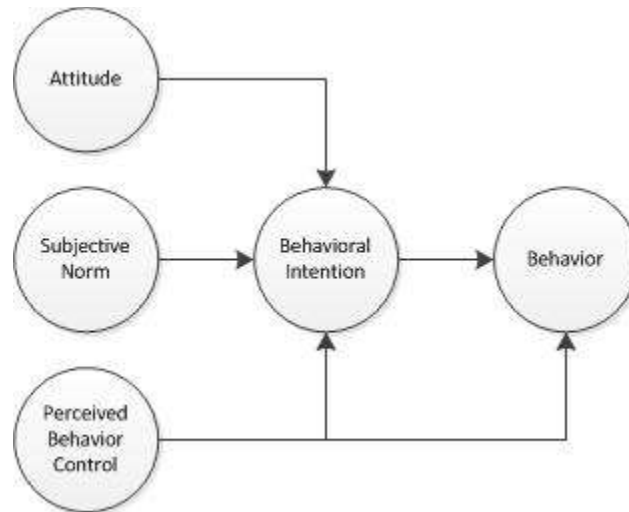


Figure 1. The Theory of Planned Behavior

Compliance-Gaining Techniques

In an empirical analysis of proposed compliance-gaining techniques, Marwell and Schmitt identified sixteen prominent techniques (see Table 1) and classified them into five cluster factors. These five cluster factors include (I) rewarding activity, (II) punishing activity, (III) expertise, (IV) activation of impersonal commitments, and (V) activation of personal commitments. (Marwell & Schmitt, 1967).

Table 1. Compliance Gaining Techniques

1. Promise	(If you comply, I will reward you.)
2. Threat	(If you do not comply I will punish you.)
3. Expertise (positive)	(If you comply you will be rewarded because of “the nature of things.”)
4. Expertise (negative)	(If you do not comply, you will be punished because of “the nature of things.”)
5. Liking	(Actor is friendly and helpful to get target in “good frame of mind” so that he/she will comply with request.)
6. Pre-giving	(Actor rewards target before requesting compliance.)
7. Aversive Stimulation	(Actor continuously punishes target making cessation contingent on compliance.)
8. Debt	(You owe me compliance because of past favors.)
9. Moral Appeal	(You are immoral if you do not comply.)
10. Self-Feeling (positive)	(You will feel better about yourself if you comply.)
11. Self-feeling (negative)	(You will feel worse about yourself if you do not comply.)
12. Altercasting (positive)	(A person with “good” qualities would comply.)
13. Altercasting (negative)	(A person with “bad” qualities would not comply.)
14. Altruism	(I need your compliance very badly, so do it for me.)
15. Esteem (positive)	(People you value will think better of you if you comply.)
16. Esteem (negative)	(People you value will think worse of you if you do not comply.)

Cluster I: Rewarding Activity involves three of the sixteen identified techniques as to manipulating the target’s environment with a positive intention. These techniques include *pre-giving*, *liking*, and *promise*.

Cluster II: Punishing Activity involves two of the sixteen identified techniques as to manipulating the target’s environment with a negative intention. These techniques include *threat* and *aversive stimulation*.

Cluster III: Expertise involves two of the sixteen identified techniques as to utilizing an expert opinion on the potential outcome if the user complies. These techniques include both *positive expertise* and *negative expertise*.

Cluster IV: Activation of Impersonal Commitments involves seven techniques that Marwell and Schmitt describe as “non-active” techniques. These techniques include *positive self-feeling*, *negative self-feeling*, *positive altercasting*, *negative altercasting*, *positive esteem*, *negative esteem*, and *moral appeal*.

Cluster V: Activation of Personal Commitments involves the remaining two techniques, along with slight overlap of some techniques identified in Cluster IV. The primary two techniques identified in this cluster are *altruism* and *debt*, with some considerations for overlap with *negative esteem*, and *negative altercasting*.

The Research Model

The five clusters of techniques can be considered forms of behavior control. Augmenting the techniques with the theory of planned behavior produces the research model shown in Figure 2.

Attitude has been examined multiple times in the context of user behavior. What has not been examined is the efficacy of techniques of behavior control, and to some extent subjective norm. Therefore, our study targets various forms of compliance control and subjective norm. Our study proposes that many of the above clusters of compliance-gaining techniques can be used to predict end user behavior, in the context of policies dictating what is acceptable use on a network (Siau, Nah, & Teng, 2002). If effective techniques can be identified, they will be helpful to management in policy compliance in this turbulent environment.

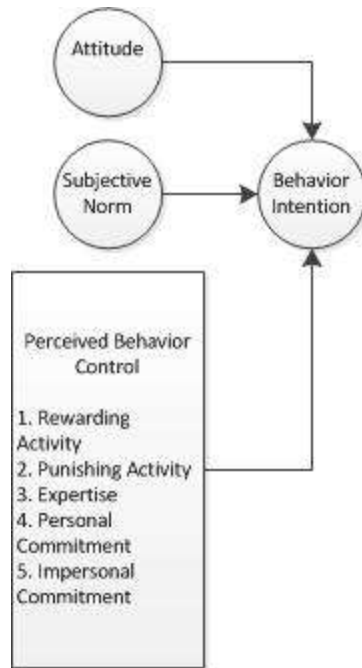


Figure 2. The Research Model for Policy Compliance

Hypotheses

This study hypothesizes that users are now empowered to simply circumvent acceptable use policy that they do not like, in order to access any network they would want to while on the clock. Because the users are now empowered with this mobile connectivity, managers have to reassess how they get users back on task, and the proposed techniques are those of identified compliance gaining techniques.

Hypothesis 1: Compliance-gaining techniques in the rewarding activities cluster will have a positive effect on behavioral intention of policy compliance.

Hypothesis 2: Compliance-gaining techniques in the punishing activity cluster will have a positive effect on the behavioral intention of policy compliance.

Hypothesis 3: Compliance-gaining techniques in the expertise cluster will have a positive effect on behavioral intention of policy compliance.

Hypothesis 4: Compliance-gaining techniques in the personal commitment cluster will have a positive on behavioral intention of policy compliance

Hypothesis 5: Compliance-gaining techniques in the impersonal commitment cluster will have a positive effect on behavioral intention of policy compliance.

Hypothesis 6: Attitude has a positive effect on behavioral intention of policy compliance.

Hypothesis 7: Subjective norms have a positive effect on behavioral intention of policy compliance.

Methodology

Survey Instrument

A survey instrument was developed and subjected to a pretest and pilot test. Several revisions were made from each phase of the testing, in order to improve instrument design and validity. This survey offered users a scenario in which they were in the part-time employment of a call-center, and the call center had recently implemented a new Acceptable Use Policy that included blocking access to social media websites. The survey then offered a scenario in which a manager utilized each of the aforementioned compliance techniques, and captured the users' intention to comply against their response to comply or circumvent the policy.

Pretest

A pretest was conducted in order to develop and refine the survey instrument. In the pretest, 9 respondents evaluated the survey instrument. In doing so, several refinements have been made in order to account for demographic information, as well as level of education, and level of exposure to mobile technology. In the pretest, there was strong evidence that the users would simply circumvent the policy no matter what technique was used.

Pilot Test

After the pretest was conducted, several revisions to the survey instrument had been made, including greater control over the response variables of users' likeliness to comply and the

technique being incorporated in the survey. The pilot test included 11 responses, and offered direction for future results, including the same results that users would simply circumvent the policy. The final instrument is included in the appendix.

Subjects and Procedure

The subjects for this research are undergraduate and graduate students at a regional U.S. university. Students at any level of their degree program were invited to respond, along with their demographic information. The demographic analysis was conducted on the basis of education level (some college, completed bachelors, completed masters, etc), age, and gender.

Measurement

A measure of the mean and standard deviation has been used to identify the relationships between users' likeliness of compliance and the technique being employed. In order to capture more rich data, both a "high" and a "low" scenario for each technique (e.g., high reward and low reward) have been employed in order to further understand if a user would be more likely to respond to a higher reward/punishment scenario verses a lower reward/punishment scenario.

Results

A survey of 61 users was completed. From the data, seven of the surveys were not completed, and as such, had to be discarded. The demographics included 35 respondents from 18 to 25 years of age, 19 respondents from 26 to 34 years of age, and 6 respondents over the age of 35. The gender split of the data is 28 male, and 32 female. On education, 54 respondents had completed at least some college, while six had either completed or were in the process of graduate degrees.

User compliance was measured on a 7-point Likert scale, where lower numbers mean lower compliance (extremely resistant), higher numbers mean higher compliance (extremely

accepting, and 4 meaning neutral to the policy. From the pretest and the pilot test, the data hinted that users would simply reject the policy in the survey, as well as circumvent the policy if managers were not subjected to the policy. After collecting the full data, a two sample t-test was used to assess if the compliance activities had any measurable effect from the users intention to comply with the policy. The user's intention to comply without using any technique (i.e., the base case) was averaged from two questions, giving a mean of 2.59. Therefore, each technique's compliance value is compared with this base value. As noted before, each technique was assessed using both a low and high compliance scenario to assess the effect these techniques have on the user's intention. Presented below in Table 2 are the t-test results on the effectiveness of these techniques. For ease of interpretation, the techniques and subjective norm are presented in descending order of effectiveness.

Table 2. Effectiveness of the Compliance Techniques

Column1	Cluster	Mean	t-value	P-Value
Promise-high	1	5.33	9.7	<.00001
Promise-low	1	5.12	9.19	<.00001
Pre-giving-high	1	5.22	8.96	<.00001
Altercastingpositive-high	4	4.73	8.1	<.00001
Esteem-high (positive)	4	5	8.03	<.00001
Esteem-low (positive)	4	4.73	7.97	<.00001
Pre-giving-low	1	4.82	7.57	<.00001
Liking-high	1	4.78	7.39	<.00001
Altruism-high	5	4.73	7.31	<.00001
Liking-low (1	4.45	6.78	<.00001
Altruism-low	5	4.39	6.66	<.00001
Altercasting (negative)-low	4	4.22	5.92	<.00001
Self-feeling (positive)-low	4	4.22	5.79	<.00001
Moral Appeal-high	4	4.12	5.5	<.00001
Threat-low	2	4.12	4.92	<.00001
Debt-low	5	4.04	4.89	<.00001
Self-feeling (positive)-high	4	3.96	4.82	<.00001
Expertise(positive)-high	3	3.9	4.43	<.00001
Moral Appeal-low	4	3.82	4.38	<.00001

Self-feeling (negative)-high	4	3.98	4.17	<.00001
Debt-high	5	3.73	4.01	<.00001
Expertise (negative)-low	3	3.65	3.63	<.00001
Social Norm		3.59	3.12	<.00001
Altercasting (negative)-low	4	3.51	2.97	<.00001
Expertise(negative)-high	3	3.53	2.95	<.00001
Expertise (positive)-low	3	3.45	2.87	<.00001
Self-feeling (negative)-low	4	3.29	2.33	0.022
Altercasting (positive)-high	4	3.12	1.85	0.067
Threat-high	2	3.16	1.79	0.076
Esteem (negative)-low	4	3.08	1.69	0.095
Esteem (negative)-high	4	2.71	0.4	0.69
Adverse Stimulation-low	2	1.73	-2.76	<.00001
Adverse Stimulation-high	2	1.73	-3.14	<.00001

Discussion

From the results, it is evident that the most statistically significant cluster is that of Cluster I, or rewarding activities. The important thing to take away here is that all six of the tested high and low rewarding activities were ranked in the top 11 statistically significant results. The implication of this result is that managers can adapt their strategy in order gain user acceptance. What if the manager promised not to threaten?

Interestingly, Cluster 2, which is punishing activities, goes against the hypotheses, in that it causes users to reject the policy changes. Or in simpler terms, they'd circumvent the policy with their own mobile devices if they were faced with either a situation which activates adverse stimulation, or that of a threat from a manager.

Of the remaining clusters: expertise, activation of impersonal commitments, and activation of personal commitments were found to be interspersed between each other in terms of gaining user compliance. This may be due to the nature of cluster 4, which incorporates more activities than the other clusters, or it may be a result of a clearly defined strategy that works,

such as rewarding activities, and a clearly defined strategy that doesn't work, such as punishing activities.

The most significant contribution of this research is the fact that fifteen of the sixteen activities identified showed statistically significant results in either a moderate usage of the technique (low) or a more explicit usage of the technique (high). The one technique that did not show any compliance effect was the usage of negative esteem. On the other hand, adverse stimulation reduced compliance. In conclusion, the results support hypothesis 1, 3, 4, 5, and 7. Hypothesis 2 was found to have the opposite effect.

Future Direction

Given the strong evidence that suggests that users will simply circumvent the policy with their own mobile devices, this research offers insights into compliance gaining techniques. Further research should examine these techniques in more detail and with different scenarios. Such research is timely for management when compliance is difficult to enforce in open in age of Web 2.0 technologies and social media.

Limitations

This study is not without limitations. The data has been collected from a student population at a single university. The average age range captured was strongly towards the 18-25 demographics, which have had more exposure to social networking than other demographics, simply due to the age of social networking. As such, a study that captures the full gamut of age ranges could offer better insights. This isn't to say that the results are insignificant, given the scenario of a part time worker at a call center, which offers a realistic scenario to any student seeking supplemental income.

The survey instrument had to be developed by the authors and may require further validation. It has been executed on a population once, and as it needs to be checked for reliability and replicability. Furthermore, the instrument needs to include a control for users who have very little experience with mobile technologies.

Conclusions

Policy compliance is an important concern for IS managers. With new technologies, smart devices and social media, it has become increasingly possible for users to circumvent IS policy. This research therefore attempted to assess the efficacy of various compliance techniques. Two theories from psychology and sociology: the theories of *planned behavior* and *compliance-gaining techniques* were identified to develop a research model to assess user compliance to any changes in a policy revision. Sixteen techniques and the effect of subjective norm were assessed. Most techniques were effective in compliance. However, the reward-based techniques were more effective and the punishment based techniques less effective. In fact, some high punishment techniques had the opposite effect of reducing compliance. These results are useful for both researchers and practitioners. The practitioners, armed with these results, can carefully select compliance techniques in their organization. Researchers need to further examine these techniques for a deeper understanding and a contextual examination.

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Appendix

Survey Instrument

Scenario: You work part-time as a call center representative at a local call center whose pay is based on commission, with a computer that has access to social media websites including Twitter, Facebook, and Pinterest. Up until today, the acceptable use policy of the network allowed you to use these resources to your best judgment. Today, management is suggesting a change to the policy to block these websites because of too much lost productivity. With the policy being changed, it is still possible to access these websites via a mobile device such your personal iPad or smartphone.

Each of the scenarios listed below should be taken independently of each other, in order to measure your reaction.

On a scale of 1 to 7, 1 being extremely unlikely and 7 being extremely likely, please indicate your reaction, given the following situations.

1. You will comply with the policy.
2. You plan on using a mobile device to circumvent the policy.
3. Several other co-workers plan on bringing in their own devices to get around the policy, so you will as well.
4. Several other co-workers are searching for other jobs, and you will as well.

On a scale of 1 to 7, 1 being extremely resistant and 7 being extremely accepting, please indicate your reaction to the policy given each of these situations.

1. The managers aren't subjected to the policy.
2. The policy is changed without any notice.
3. The company had mentioned briefly before that the policy would be changed, but solicited no input from you or any other users.
4. Management offers a \$25 gift card if your productivity increases after the policy change.
5. Management offers a \$200 gift card if your productivity increases after the policy is implemented.
6. If you are caught circumventing the policy with a mobile device, then you could be reprimanded.
7. If you are caught circumventing the policy with a mobile device, then you will be fired.
8. The managers offer the following reason for the policy change, "Since you won't be distracted any longer, your quota and thus commission will go up."
9. The following reason given for the change is "This policy will passively increase your sales since you won't have this distraction."
10. Management says, "If you stay on these websites, you will make no sales, and thus we have no reason to be here."
11. Management says, "If you stay on these websites, you have more important things to do than work here, and will be fired."

12. Your manager approaches you personally, and says, “You’ve been really good with your sales, and, I think you could be even better if we focused entirely on that.”
13. Your manager approaches you personally, and says, “You’ve been really good with your sales, you’re a terrific person with a great personality. I think if you really apply yourself and not spend so much time facebooking, you could move up in this organization.”
14. Your commission is raised by 2% as an incentive to stay off of your mobile devices.
15. Your commission is raised by 10% as an incentive to stay off of a personal mobile device.
16. The manager asks to view your profiles on the social media sites, to see if there are timestamps matching up with working hours.
17. The manager asks for your password to social media sites, in order to monitor your usage without incurring I.T. expenses.
18. The manager speaks with you and mentions, “Hey, you know I looked the other way when you were doing this. Do me this favor and just tone down the tweeting.”
19. The manager is a close friend of yours. They mention “Hey, I helped get you this job. I think you owe it to me so we both don’t look bad.”
20. The company equates using these sites to the same as time theft.
21. One of your coworkers spends a disproportionate time on Facebook. A fellow college notices and mentions, and that every hour they are not working, they have stolen resources from the company.
22. Management mentions that you’ll feel better about your work if you stay on task.
23. Management mentions that you’ll feel better about yourself and your work and can apply the increased productivity skills to future job prospects.
24. A manager mentions that you will have to have a talk about the company policy if you’re caught circumventing the policy with a mobile device.
25. A manager mentions that, “getting fired isn’t the best feeling in the world” if you’re caught circumventing the policy.
26. The company uses George, who has the #1 sales record, as an example of what can happen if you stay on task.
27. A manager approaches you and says that they believe in you, and that you can break the sales record, especially after this policy change, and it will reflect positively on you.
28. A manager mentions to you that only bad employees would try to circumvent the policy.
29. A manager mentions that previously employees who had been fired had tried to get around company policies.
30. A manager mentions that they had looked the other way when you were on Facebook on the company computer before, and that, maybe as a personal favor, you could try not to go around the policy for them.
31. A manager who recommended you for the job has looked the other way when you were using company time with Twitter, and that as a personal favor, given that they helped get you the job, you could try not to go around the policy for them.
32. The company has implemented a “Sales person of the week” program, and the person following the policy gets special recognition.
33. The company has implemented a rolling “Sales person of the week” program wherein if the person continues to get the “person of the week,” a rolling bonus is given.
34. The company has started to display everyone’s sales on a whiteboard, highlighting the people following the policy.

35. The company has started to display everyone's sales on a whiteboard, highlighting the people not following the policy, and potential layoffs could result.

Demographics

Please indicate your age:

Please indicate your gender:

Please indicate your level of education (ie: freshman, sophomore, graduate student):