

The Behavior Grid: 35 Ways Behavior Can Change

BJ Fogg

Persuasive Technology Lab
Stanford University
captology.stanford.edu
www.bjfogg.com

bjfogg@stanford.edu

ABSTRACT

This paper presents a new way of categorizing behavior change in a framework called the Behavior Grid. This preliminary work shows 35 types of behavior along two categorical dimensions. To demonstrate the analytical potential for the Behavior Grid, this paper maps behavior goals from Facebook onto the framework, revealing potential patterns of intent. To show the potential for designers of persuasive technology, this paper uses the Behavior Grid to show what types of behavior change might most easily be achieved through mobile technology. The Behavior Grid needs further development, but this early version can still be useful for designers and researchers in thinking more clearly about behavior change and persuasive technology.

General Terms

Design, Measurement, Experimentation, Human Factors.

Keywords

Persuasion, behavior change, motivation, persuasive technology, captology, persuasive design, psychological frameworks

1. INTRODUCTION

1.1 The need to understand behavior types

When we create persuasive technology systems, we need to understand what type of behavior we seek with our creations. Not all behaviors are the same. For example, people who create banner ads for web sites hope people will click on their ads, a one-time act of compliance. In contrast, people who create web services like Flickr or Facebook hope that their creations will persuade people to repeat complex behaviors each day, such as logging in and uploading content. With Flickr and other consumer services, the persuasive intent is to create a life-long habit in users. (Note: In this paper, “persuasion” refers to attempts to influence people’s behaviors, not attitudes.)

People who create banner ads and people who create services like Flickr are all designing persuasive technology. However, the behaviors they seek differ. The techniques they use also differ. For example, to gain one-time compliance, such as clicking on a banner ad, a designer can use deception as a strategy. This approach won’t work for consumer services that intend for people to become loyal customers for years.

Contrasting the two behaviors above is a simple way to show that target behaviors differ and that the strategies and techniques for success in each case are different. Even more fundamentally, the theories that describe persuasion in these two scenarios differ. For example, the theories about compliance are not the same as those relating to forming lifelong habits.

2. THE BEHAVIOR GRID

To create a more efficient way to study and design for various types of human behavior, I’ve developed a new framework I call the Behavior Grid. This framework is especially relevant to studying and designing persuasive technologies because in this emerging field we are, more and more, exploring ways to automate how persuasive products get made, perhaps most notably demonstrated by automatic features in Google Website Optimizer. One step forward in this inevitable path is to categorize human behavior change in a clear way, hence the need for a tool like the Behavior Grid.

The Behavior Grid categorizes behavior change along two axes. These axes form a table with 35 cells. Figure 1 shows the Behavior Grid, with a sample behavior change listed inside each of the 35 cells.

Because the Behavior Grid is new, insights continue to emerge. This paper is a way to share early ideas and seek feedback. Certainly, a static document like this paper is not well suited for conveying emerging content and related work. I encourage readers to see www.BehaviorGrid.org for the most current explanation of the Behavior Grid, as well as citations to and discussions of related theories and models. That website also solicits feedback on the ideas in this paper.

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. To copy otherwise, to republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee.

Persuasive '09, April 26-29, Claremont, California, USA.

Copyright © 2009 ACM ISBN 978-1-60558-376-1/09/04... \$5.00

2.1 Horizontal Axis: Type of Behavior Change

The horizontal axis in the Behavior Grid categorizes behavior according to what I call the “Type of behavior change.” The text below describes Figure 1. (For the sake of brevity, I won’t give specific examples in the text because those are readily found on the Behavior Grid figure.)

In my framework, Column A is for behaviors that are new and unfamiliar to people. Column B is for behaviors that are already familiar to people. This distinction matters. People likely approach new behaviors differently from familiar ones, and the strategies for motivating new behaviors differ, in part, from those for motivating repeat behaviors.

Column C is for increasing a behavior, which can mean increasing the frequency, intensity, or duration. In contrast, Column D is for decreasing behavior. This again could mean decreases in frequency, intensity, or duration. Finally, Column E is for stopping a behavior. This means ceasing to do a behavior that already exists.

Taken together the columns in the horizontal axis provide a useful segmentation of behavior change, ranging from starting to stopping behaviors. In my research and design projects, as I used these five categories to better understand types of behavior change, I realized an important dimension was missing. That insight led to creating the vertical axis.

2.2 Vertical Axis: Schedule

As I worked on developing a second axis to categorize behaviors, I realized that the key second dimension turns out to be time, or more accurately, scheduling of the behavior types. This second axis of the Behavior Grid is of equal importance as the first axis. For the sake of clarity, I’ve assigned numbers to the rows for each of the seven behavior schedule types.

In my framework, Row 1 is for “one-time” behaviors. Row 2 is for “one-time” behaviors that “lead to an ongoing obligation or cost.” This distinction may seem subtle, but from a persuasion standpoint the difference is large. It’s easier for people to perform a behavior one time and forget about it. It’s harder to perform a behavior if we know we are committing ourselves to future tasks. For example, Row 1 is playing with a puppy one time, while Row 2 is adopting a puppy. That’s a big difference.

Row 3 in the Behavior Grid is for behaviors that last a period of time; in other words, these behaviors have an intended duration. Row 4 is for behaviors that happen on a predictable schedule. In contrast, Row 5 is for behaviors that happen on cue, which means an irregular cue, not on a fixed schedule.

In the framework, Row 6 is for behaviors that people perform at will. There’s no cue and no schedule involved. Finally, Row 7 is for behaviors that are always performed, as illustrated by examples in the cells for Row 7.

		What Type of Behavior Change?				
		A	B	C	D	E
		perform new behavior (unfamiliar behavior)	perform existing behavior (familiar behavior)	increase behavior (frequency, intensity, or duration)	decrease behavior (frequency, intensity, or duration)	stop behavior (cease ongoing behavior)
On What Schedule?	1 one time behavior	Take a new type of survey online	Purchase book at Amazon	Buy additional books online today	Spend less time on mySpace today	Don't eat desert tonight
	2 one time behavior that leads to ongoing obligation/cost	Adopt a dog	Agree to host a party	Agree to pay more on mortgage	Pay less on a credit card one time	Refuse to continue chemotherapy
	3 behavior for a period of time (X has a duration)	Play a new video game for one hour	Exercise for 30 minutes	Floss longer for two weeks.	Spend less money on books this month	Don't complain about anything today
	4 behavior on a predictable schedule (X gets repeated, periodicity)	Attend online class each week for a month	Gamble online each morning at 10am	Exercise with higher heartrate each morning	Eat smaller portions for dinner.	Don't smoke after dinner each evening
	5 behavior is on cue (X is cued irregularly; it's a change in habitual response)	Report any spam to AOL	Drink water at each fountain you see.	Write a longer thank you note after a dinner party	Control your frustration when driving in gridlock	Don't buy anything at checkout stand
	6 behavior is at will (can perform x at any moment)	Read website privacy policy	Check computer for viruses	Check for computer viruses more often	Drink less coffee	Stop interrupting during conversations
	7 behavior is always performed (X means change in habit, in way of being)	Use Google for online searching	Maintain good posture	Think thoughts of appreciation	Reduce energy consumption in home	Stop cursing

Figure 1: The Behavior Grid is a new framework for characterizing 35 types of behavior change.

3. 35 BEHAVIOR TYPES WITH THEORIES, STRATEGIES, AND TECHNIQUES

The two axes in the Behavior Grid define 35 cells, each with a unique behavior type. Figure 1 lists a sample behavior for each cell to make the behavior types clearer. Note that each cell can be described by a letter and number derived from the axes. For example, a persuasive technology system can be designed to motivate a “D6” behavior, which indicates “decreasing an existing behavior” that “people perform at will.”

I propose that each cell in the Behavior Grid corresponds to a unique set of psychological theories, persuasion strategies, and design techniques. Understanding how theories, strategies, and techniques can map onto the new framework is one fundamental purpose of the Behavior Grid.

First of all, the behavior in each cell suggests psychological theories. To date, no one has fully mapped these theories onto the cells, but an initial mapping shows that one theory, such as operant conditioning, often extends across columns or rows. In other words, the application of a theory to the Behavior Grid appears to systematic. One future step in this path would be to

map studies about persuasive technology onto the framework. This would serve as a method for organizing existing research in persuasive technology.

Next, persuasion strategies can also be mapped onto the cells. Opinions vary on how many persuasion strategies exist. In previous work, I’ve listed about 60 strategies. The specific number doesn’t matter, except that it is a finite, manageable number. What matters more in this paper is the insight that a strategy like “foot-in-the door” works for behaviors in some to cells and not others. No one has yet fully mapped persuasion strategies onto the Behavior Grid, a good topic for future work.

Finally, design techniques can map onto the Behavior Grid. By “design techniques” I mean a specific implementation of a persuasive experience. For example, Amazon uses various techniques to get customers to buy more books. One of Amazon’s techniques is to offer free shipping for purchases over \$25. The timing of Amazon’s offer and how it is worded is a design technique. As one can imagine, the number of design techniques is large, perhaps uncountable.

		A	B	C	D	E
		perform new behavior	perform existing behavior	increase behavior	decrease behavior	stop behavior
1	one time behavior	A1: 4 posts • install facebook app on iPhone • join a group • become a fan • invite friends to facebook	B1: 4 posts • Poke friend • join a group • upload photo • write message on friend’s wall	C1: 0 post	D1: 0 post	E1: 0 post
2	one time behavior that leads to ongoing obligation/cost	A2: 3 posts • create a group • create a page • create profile	B2: 3 posts • create a group • create a page • change profile info	C2: 0 post	D2: 1 post • ignore notifications	E2: 1 post • change security settings
3	behavior for a period of time	A3: 1 post • Play a new game app	B3: 0 post	C3: 1 post • chat with friends	D3: 0 post	E3: 0 post
4	behavior on a predictable schedule	A4: 0 post	B4: 1 post • check news feed every morning	C4: 0 post	D4: 0 post	E4: 0 post
5	behavior is on queue	A5: 1 post • install new application	B5: 5 posts • Poke back friend • read other’s posts • visit friend’s profile page • join an event • respond to friend’s post	C5: 4 posts • read msg by SMS • send a birthday message • answer to friend request by SMS • Upload photo from mobile	D5: 0 post	E5: 0 post
6	behavior is at will	A6: 1 post • click a sponsored link	B6: 3 posts • brows new applications • search a new group • search a new friend	C6: 2 posts • set SMS notification active • use facebook app on iPhone	D6: 0 post	E6: 1 post • remove application
7	behavior is always performed	A7: 2 posts • Always tag friends in photos on Facebook • save the log-in information	B7: 1 post • Always tag friends in photos on Facebook	C7: 2 posts • Always tag friends in photos on Facebook • use facebook-mail more often	D7: 0 post	E7: 0 post

Figure 2: Target behaviors from Facebook mapped on the Behavior Grid, showing patterns of persuasion.

4. MAPPING CONTENT ONTO THE GRID

As my colleagues and I develop the Behavior Grid, we ask ourselves which next step matters most: mapping theories, studies, strategies, or techniques onto the framework. Each one would be a substantial task.

Industry designers who have seen early versions of the Behavior Grid are most enthusiastic about mapping design techniques to each cell. For these industry people, it's enticing to be able to see specific examples of how a persuasive system achieved a C2 behavior – or any other behavior of interest to the company. This resource would give commercial designers a faster and easier way to create persuasive systems.

4.1 Behavior Grid in analysis: Target behaviors from Facebook

To further understand how to map behaviors onto the Behavior Grid, design researcher Daisuke Iizawa and I identified apparent persuasion goals from Facebook, a popular social networking site. We placed these behaviors onto the Behavior Grid. The resulting map is shown in Figure 2.

As we placed the target behaviors from Facebook onto the Behavior Grid, we saw patterns emerge. Perhaps most notable is that Facebook offered many design techniques for persuading

people to perform new and existing behaviors, and to increase those behaviors, as shown in Figure 2 by the cells populated with items in Columns A, B, and C of the Behavior Grid. In contrast Facebook offered relatively few design techniques to persuade people to decrease or to stop a behavior, as shown by the lack of items in Columns D and E.

As we look at the Behavior Grid in Figure 2 from the vertical axis, we note other patterns. Rows 3 and 4 have few items in their corresponding cells. This suggests that Facebook offers few design techniques to persuade people to perform behaviors “for a period of time” or “on a schedule.” In our experience using Facebook for two years, this pattern has external validity. Facebook is designed for convenience, so it doesn't require people to comply with a schedule or to use the service for a fixed period of time.

In contrast, the behaviors promoted by Facebook are largely “one time behaviors” (Row 1), “one time behaviors that lead to ongoing obligation” (Row 2), and “behaviors on cue” (Row 5). Again, this pattern on the Behavior Grid seems to match the overall experiences my colleagues and I have had using Facebook.

Although Figure 2 does not list all the target behavior from Facebook, the patterns that emerge so far seem to have external validity. For example, the cell with the most listed items is B5,

		What Type of Behavior Change?				
		A	B	C	D	E
		perform new behavior (unfamiliar behavior)	perform existing behavior (familiar behavior)	increase behavior (frequency, intensity, or duration)	decrease behavior (frequency, intensity, or duration)	stop behavior (cease ongoing behavior)
On What Schedule?	1 one time behavior	Take a new type of survey online	Purchase book at Amazon	Buy additional books online today	Spend less time on mySpace today	Don't eat desert tonight
	2 one time behavior that leads to ongoing obligation/cost	Adopt a dog	Agree to host a party	Agree to pay more on mortgage	Pay less on a credit card one time	Refuse to continue chemotherapy
	3 behavior for a period of time (X has a duration)	Play a new video game for one hour	Exercise for 30 minutes	Floss longer for two weeks.	Spend less money on books this month	Don't complain about anything today
	4 behavior on a predictable schedule (X gets repeated, periodicity)	Attend online class each week for a month	Gamble online each morning at 10am	Exercise with higher heartrate each morning	Eat smaller portions for dinner.	Don't smoke after dinner each evening
	5 behavior is on cue (X is cued irregularly; it's a change in habitual response)	Report any spam to AOL	Drink water at each fountain you see.	Write a longer thank you note after a dinner party	Control your frustration when driving in gridlock	Don't buy anything at checkout stand
	6 behavior is at will (can perform x at any moment)	Read website privacy policy	Check computer for viruses	Check for computer viruses more often	Drink less coffee	Stop interrupting during conversations
	7 behavior is always performed (X means change in habit, in way of being)	Use Google for online searching	Maintain good posture	Think thoughts of appreciation	Reduce energy consumption in home	Stop cursing

Figure 3: The shaded areas are the behavior types that seem most suited for mobile persuasion.

which is “perform an existing behavior on cue.” This phrase seems to describe well a major strategy used by Facebook. The service presents a cue (such as an email notification or a request) and users respond to that cue. In fact, we have previously noted how Facebook uses operant conditioning to train users to perform behaviors on cue.

Our mapping of the Facebook behavior targets onto the Behavior Grid is preliminary. The purpose for sharing this early work is to give some insight into how target behavior from a real-world persuasive technology can be mapped and analyzed using the Behavior Grid.

4.2 Behavior Grid in design: Potential for mobile persuasion

In the previous section, we mapped existing target behaviors onto the Behavior Grid to show patterns. In this section, we take the opposite approach. We start with patterns on the Behavior Grid to highlight which target behaviors have the most potential. In this case, we are mapping the potential that mobile phones have for behavior change.

Using mobile phones as platforms for persuasion is relatively new, but the potential is growing. One unanswered question is “What types of persuasion work best on mobile phones?” The Behavior Grid is one way to get insight into the answer.

Drawing on my research and design experience in mobile persuasion, I assessed the potential for using the mobile phone to achieve behaviors designated by each row and column of the Behavior Grid. For example, I considered the types of behavior in Column A – “perform new behavior” – and I evaluated whether the mobile platform is adept at motivating this type of behavior. I repeated this for each Column and Row. From this I created a map over the Behavior Grid that shows, according to my estimation, the best and worst areas for mobile persuasion. The result is in Figure 3, with the shaded region showing the 10 behavior types with most potential on mobile phones. The non-shaded regions show what types of behaviors might be difficult to achieve when using mobile phones as platforms for persuasion.

Again, this work is preliminary and draws solely on my own experience working in mobile persuasion. The purpose here is not to offer a final map for mobile persuasion but to show the potential for using the Behavior Grid as a generative tool in designing persuasive experiences.

5. NEW PATHS FOR RESEARCH & INSIGHT

I believe that the more we use the Behavior Grid, the more we’ll get insights into persuasive technology, and into behavior change in general. For example, in both preliminary analyses, shown in Figure 2 and Figure 3, the Columns for D and E show little attention or potential. This raises a larger question: Are persuasive technologies, in general, unsuited for decreasing or stopping behaviors? To my knowledge, no one has ever posed this question so directly. But it’s an important issue that may not have surfaced without using the Behavior Grid to show patterns.

The Behavior Grid can also shape how we compare research findings. Often research is categorized by domain: health, environment, commerce, and so on. From a persuasion standpoint, we would do better to cluster research by the type of target behavior in a study. For example, comparing all research that relates to B4 behaviors (perform an existing behavior on a predictable schedule) could illuminate new insights. It’s clear that B4 behaviors are relevant to many domains: health (take medications each night at 6 pm), commerce (check online bargains each day at 8 am), education (attend online class daily at 2 pm), and so on. By crossing these domains and focusing instead on behavior type, we would enrich our understanding of theories, strategies, and techniques for B4 behaviors. The same is likely true for all 35 types of behavior change.

In summary, the Behavior Grid is a new tool for thinking about behavior change and persuasive technology. This framework can help clarify issues in research by allowing us to identify, discuss, and compare behavior types across studies and fields. The Behavior Grid is also useful for people designing persuasive technology products. In the future, designers may be able to use this framework to design persuasive techniques that match the behavior change they seek to create. In the near term, the Behavior Grid can help teams work more efficiently by providing a taxonomy, examples, and a language for examining issues related to behavior change.

References

For a growing resource of references, examples, and insights related to this paper, see www.BehaviorGrid.org.