Physical Constraints

**DVD Drive**

DVD drives utilize physical constraints in their design in that the shape of the tray prohibits most items from entering which will not work for the device. More precisely, it only allows disc-shaped and minidisc-shaped objects to be properly placed into the tray. This design serves as a visual clue as to what type of object should be inserted, even if the person using the drive did not know its purpose.

**USB Ports and Devices**

USB ports have a physical constraint built into them; they will only allow USB-shaped plugs to be inserted into them. In a USB plug, there is a connector (which physically touches the receiving end in the USB port) and a space above it. When the plug is connected to the port, the space is filled in by a white piece which is part of the port. The connector connects to the port, and the port also connects to the connector. By utilizing this design, only a USB device may be plugged into a USB port.

**Keyboard Buttons**

Keyboard buttons are designed in such a shape so that they can fit comfortably into the grooves of the keyboard frame. Because they fit so snugly into the keyboard, there is only one way to manipulate them without extra effort; the user must push them down.
Cultural Constraints

Cell Phone Use on a Public Transportation

When people use their cell phones on public transportation, it is considered rude. While technically allowed as per the design of the device, in the cultural context of a commute to work, people find it very annoying when someone talks loudly on their cell phone. Some people like to use their commute time to read, do work, or even think, and a loud passenger talking on their phone interrupts all of these activities. This cultural constraint is often ignored by rude people, which has caused SEPTA to implement a QuietRide train car policy. If someone is caught talking on a cell phone on a QuietRide car, they will be asked to end their call or risk being ejected from the train (“QuietRide Car”, 2010).

Inappropriate Laptop Use During Class

A cultural constraint commonly employed in many classrooms is the restriction of laptop use for inappropriate purposes during lectures. Laptops can be very useful tools in the classroom, as they can be used to take notes, use interactive media, and open course documents; however, students also may use their laptops to surf the Internet, chat to friends, or play games. These distractions have proven frustrating for many professors, as they can lead to lower class participation and learning because students are not paying full attention.
Semantic Constraints

Monitors

An inherent semantic constraint of a PC monitor is to face toward the user. Seeing as semantic constraints “rely on the meaning of the situation to control the set of possible actions” (Norman, 2002, p. 85), it is clear to a user that a PC monitor must face the person trying to use it, as otherwise the device would have no meaning. Someone who cannot look at a monitor is effectively not using the device.

Chairs

One of the hallmarks of a semantic constraint is that their violations appear absurd to us. For instance, if we were to see someone sitting upside down in a chair, that would stand out to us as something odd. While this clearly doesn’t violate any physical constraint to use a chair this way, we know that it is not the “proper” way it should be used.

Forms

Another example of semantic constraints is encountered in interfaces that resemble “forms”. While you could technically enter just about anything into any of the numerous fields, it typically only makes “sense” in one particular way. For instance, a typical email client presents the user with a form for the recipients, the subject and the body. If not entered properly, the email will likely not go anywhere or will appear strange to the recipient.
**Errors**

**Capture Error:** A *capture error* is a type of slip where a more frequent and more practiced behavior takes place when a similar, but less familiar, action was intended.

**Ctrl-Alt-Del vs Ctrl-Alt-End**

When using Windows most users are familiar with the oft-used Ctrl-Alt-Del key combination to bring up various Windows options, the most important of which seems to be to reboot the computer after it is hopelessly frozen. This same type of freezing condition can happen when using a remote desktop program to connect to and control a remote machine. In this case the key combination to bring up these options is Ctrl-Alt-End. There are many instances of a user using Ctrl-Alt-Del and accidentally rebooting their own machine instead of the remote machine.

**Number swap**

A common capture error that is observed by people is Number swapping. This occurs when people give out a familiar number in place of one they are requested due to the repetition of giving the number out frequently, such as giving out your home phone number when asked for your work or cellular number.
Email error

A sometimes very costly capture error occurs when one hits the reply all button on an email when a single recipient was intended. This may be due to the placement of the button being in a familiar place on the screen or associated with the enter button in place of the Send Button.

Closing the wrong window

Frequently, when users have to many windows open the try to continuously hit the close button to reduce the number of window on screen and mistakenly close a window they need. This could also result from rapid tapping of the Alt+F4 key combination.
**Description Error:** A description error is an error that occurs when a person performs an action on an object that is not the object intended.

**Phone chimes reporting an email arrived and I check my office computer instead of phone**

I have email set up to download on my phone. As well, I have my normal work email. A few days ago while hard at work, I heard the ringer on my phone alerting me to an email that needed to be checked. I immediately open Lotus Notes on my work computer so I could check my email. I was extremely confused when Notes reported that I had no new email, until I realized it had been my phone alerting me to the email, not my computer.

**Reaching for the mouse and grabbing a remote**

Due to the advent of technology in recent times many people frequently place small objects such as a mouse or a remote next to the input devices on their computer. Due to the similar shapes and sizes of the mouse and a remote or cellular phone, a common description error is one where one moves and mistakes a remote for a device for the mouse of their computer.

**Mode Error:** Mode error is a type of slip where a user performs an action appropriate to one situation in another situation, common in software with multiple modes.

Num Lock Key
The num lock key on the keyboard will toggle the keypad on the keyboard between function keys. Often this key will get toggled and a user will not know why functions are being performed instead of numbers being displayed.

References
