BOARD BUDDIES

CULTURAL VALUES AND CONTRACEPTION

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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Board games are more than a fun way to pass the time. Dartigues and colleagues discovered that playing board game use can prevent cognitive decline in elderly adults (2013). More recently, another group discovered a positive correlation between time spent playing board games and executive function (EF) development (cognitive functions related to planning, observing, and regulating one's behavior to achieve a goal) in children (Gashaj et al., 2021). Board games not only benefit mental cognition, but have been shown to improve mental health. A study at Baylor University found couples that played board games experienced an increase in oxytocin levels, facilitating couple bonding (Paddock, 2019). The Dartigues group also found that adults who played board games experienced less symptoms of depression than their non-player counterparts (2013). However when one lives far away from friends, family, or their significant other, as may be the case for elderly adults, recent graduates, or long-distance couples, the only way to play a game may be through a web application on a phone or computer.

Many studies concur that screentime is bad for people's health and wellbeing. In 2015, Hale & Guan performed a meta-study on screentime and sleep in children and adolescents. They concluded that screentime adversely affects sleep by delaying the time at which participants are able to fall asleep and reducing the overall time they stay asleep. A screen interface also causes digital eyestrain and reduces occupational productivity (Rosenfield, 2016). Moreover, a digital game played on a phone or computer does not allow a user to "unplug" from social media and notifications from other apps. Players using a digital interface are more likely to engage with social media, which has been correlated with depressive symptoms (Kelly et al., 2018). Lastly,

when Fang, Chen, and Huang investigated subjects' response to digital and physical games, participants reported greater satisfaction when playing physical games (2016).

Currently, there is nothing that can provide the benefits of board game playing to long distance friends, family, and couples without introducing the consequences of a digital interface. Thus, my capstone group is building Board Buddies, an innovative board game system to combine the best of both worlds – board game bonding over long distances and a physical interface.

MAKING IT WORK

This system consists of two game boards which communicate over wi-fi to connect remote players. The boards themselves consist of 8x8 layout of "tiles" and an LCD display. Each tile consists of a touch button, which allows a user to indicate an input, and an LED, hidden under frosted acrylic to diffuse the light. The LED indicates the state of the tile (blank, player one's piece, player two's piece). An image projecting what a final Board Buddy might look like is seen in Figure 1. Behind the scenes, each board has an MSP430 microcontroller which is responsible for keeping track of the game state, accepting input from the buttons and the wi-fi module, calculating the next game state accordingly, and sending output to the LEDs, LCD, and wi-fi module. The wi-fi module allows the boards to connect to wi-fi and interface over the internet. When one player makes a move, this information is relayed to the other board over wi-fi and both boards are updated accordingly. The LCD display communicates additional helpful information to the user, such as whose turn it is or who has won the game. Board Buddies also checks for invalid moves and prevents cheating. The wi-fi module is communicated with via a

serial peripheral interface (SPI). A SPI system has 4 wires to maintain communication: a wire for the controller to talk to the module, a wire for the module to talk to the controller, a wire for the controller to indicate the global "clock" (rate at which information is sent) and an enable signal wire that enables the module to interface with the controller (Barry & Crowley, 2012). The LEDs are model SK9822 which use a simplified form of SPI for communication (Dongguang Opsco Optoelectronics Co., LTD., 2016). The controller sends a data and clock output, but does not receive an input back from the lights or require an enable signal. Additionally, there are buttons to turn on/off, toggle between games, and indicate a user wants to play. The boards are first being programmed with the game Othello, but the infrastructure will be compatible with running other 8x8 board games that need only a color to indicate the state of the board. For instance, Board Buddies will be able to run checkers, but not chess. This technical design will combine existing technologies to make a never-before-seen system for playing games.
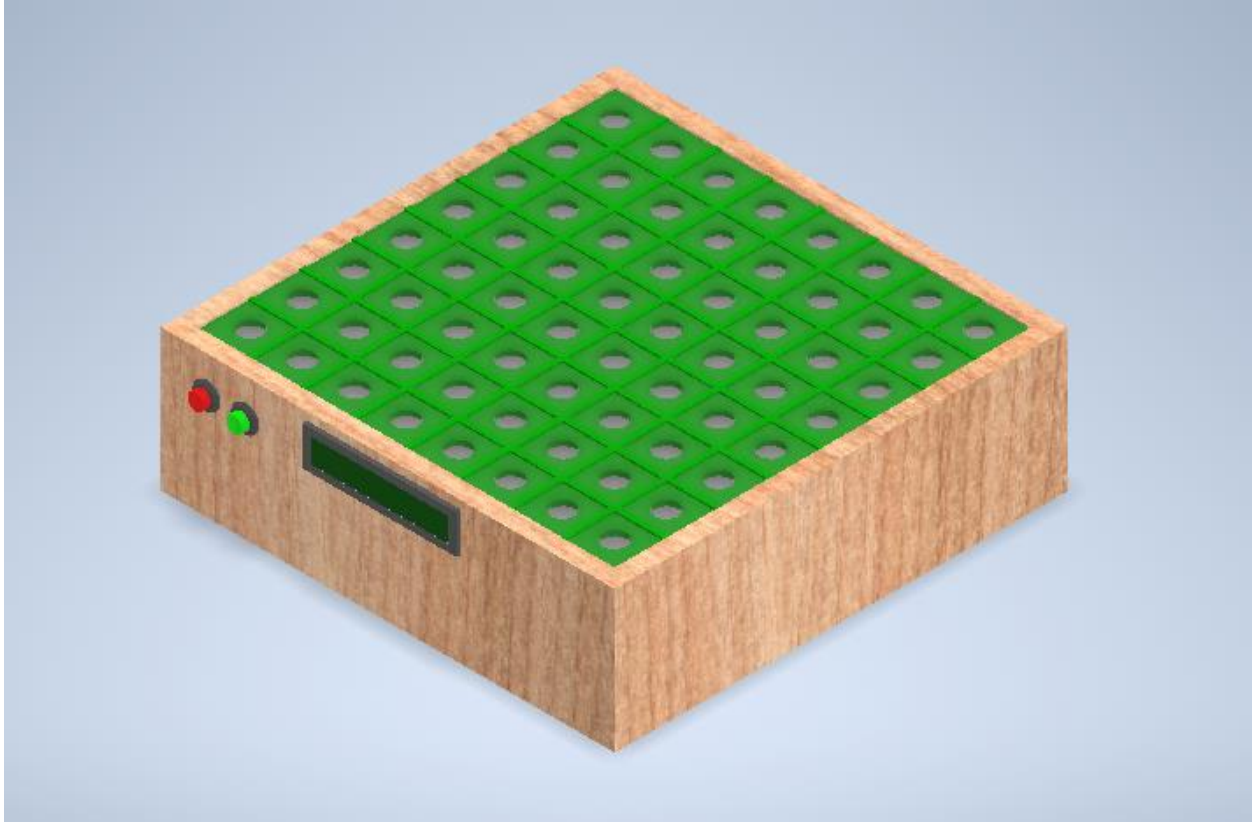
Figure 1: Projected visual of what the final product will look like. (Image credit: Daichi Monma)

VALUES AND TECHNOLOGY

Although my capstone project focuses on the technical aspects of creating this new board game system, I am interested in exploring the cultural intersections of another technology – contraceptives. There are many forms of contraception, and different social groups choose to use – or not use – different methods. For instance in Spain, condoms are the primary method of contraception (Lete et al., 2001), while in the United States, the oral contraceptive pill is most common (Wablembo & Doctor, 2013). In India, the most common method for preventing pregnancy is sterilization (Oliveira, Dias, & Padmadas, 2014). Many times, the differences in these choices are a reflection of the culture and values of the social groups. For instance, in Melinda Gates' work with the Gates Foundation, she discussed family planning with many

women in Southeastern Africa (2019). She observed how for these women, contraception was not about "freeing" them from motherhood, as is often the narrative in Western culture. Rather, contraceptives allow a woman to perform her feminine duties better (by being alive and healthy to provide for her children). In this culture, hormonal birth controls are preferred to condoms, as the latter have a cultural stigma, and are associated with disease prevention rather than contraception. If a wife asks her husband to wear a condom, it implies one of them has been unfaithful. Other groups forgo contraceptives altogether, and only support what they consider "natural methods" of reducing the chance of pregnancy, like the rhythm method (Sacred Heart of Jesus Catholic Church, 2022). The official view of the Catholic church is that the fullest expression of a married couple's love is their openness to the creation of new life as a result of their love. By suppressing fertility with technological means, a couple is forgoing that spiritual commitment and the act becomes sinful instead of holy.

To analyze the relationship between social groups, values, and preferences for contraceptive technology, I will use the framework of co-production. Co-production, first articulated by Sheila Jasanoff, is the notion that technology and the social order are intertwined (2004). Technology shapes values, customs, and identity of a social group, and in turn these aspects of a social group determine how a technology is purposed, modified, or rejected. In some cases, use or rejection of technology even defines a social group. In the case of contraception, social groups have determined how they will respond to contraceptive technologies, and their responses have in turn shaped the social world.

GETTING THE DATA

I have posed a question for investigation: How have the values of certain social groups been reflected in their decision to accept or reject various contraceptive technologies? To answer this, I will perform a meta case study, considering previous work that considers how various social groups have chosen to respond to the availability of contraceptive methods. For instance, I will study the anthropological comparison of differences in contraception and natural family planning found in Koterski's book (2002). I will read Boydell's ethnography covering usage of the contraceptive pill in London (2012). I will consider Yeatman and Trinitapoli's analysis of religious denomination and family planning in Malawi (2008), and compare this to Iyer's investigation of the relationship between religion and contraceptive use in India (2002). Another study I will read is Hill, Siwatu, and Robinson's research considering religion and contraceptive use in the United States (2014). I will use the library resources at the University of Virginia to identify more studies like these and draw conclusions about the relationship between values of various social groups and their use (or nonuse) of contraceptive technologies. Within the frame of coproduction, I can determine how different groups' cultural values affect their contraceptive preferences, and how in turn those preferences influence the groups' social norms.

TYING IT TOGETHER

My capstone project is the creation of Board Buddies, a novel system that allows two physical board games to communicate over wi-fi. This will allow its users to reap the mental and emotional benefits of board game play even in long distance relationships, but does not subject its users to the health risks associated with screen use. In the spring, my thesis will use Jasanoff's framework of co-production to analyze how cultural values influence different social groups'

response to contraceptive technologies. To do this, I will find case studies across countries and religious groups to make comparisons and answer my question.

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