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**WOMEN’S WORK: LABOR MARKET OUTCOMES AND FEMALE ENTREPRENEURSHIP IN GHANA**

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**Abstract**

This paper is an investigation of female entrepreneurship in Ghana. It seeks to answer the following question: Why are Ghanaian women so heavily concentrated in microenterprise in the informal economy? The literature review explores labor market trends for women on three different scales including an overview of developing countries, Sub-Saharan Africa regional, and Ghana-specific analysis. After exploring issues women face in formal employment, the study delves into business operations of informal, urban-based market participants by analyzing data pertaining to Ghanaian microenterprise. Additionally, the paper details the experiences and views of female entrepreneurs through in-depth interviews and participant observations with thirty female textile traders conducted in Makola Market in Accra, Ghana during the summers of 2012 and 2014. This study will contribute to the growing body of work on female entrepreneurship in the West African region.

**Introduction**

Women’s work encompasses a broad range of occupations. From the traditional faculties of matriarch and caretaker in the home to negotiator and decision maker in public and private spheres, working women are invaluable to society and the economy. Much is known about the opportunities and challenges women in developed countries face as they navigate the labor market. Although research on female labor force participation and entrepreneurship in developing countries is growing, there is still unexplored territory—especially concerning the Sub-Saharan Africa region. As this part of the world continues its development path, it is important to understand the role women play as economic agents to maximize their contribution to economic growth and development as well as societal progress.

Currently, most Africans (irrespective of gender) seeking employment in the formal labor market in their countries face many obstacles. High levels of
unemployment and underemployment underscore systemic rigidities which stem from many factors including a weak private sector. Without a well-developed labor market to provide a living wage, operating a small business or hawking goods in public spaces becomes an alternative form of generating income. For many African women, societal views and pressures may further limit their career outcomes by preventing them from acquiring the skills and network necessary for employment in the formal labor market. Out of necessity, trading goods in the informal market becomes their primary occupation. This is the case throughout the West African region. In countries like Nigeria, Togo, and Liberia, “market women”, as they are called, are the faces of micro-enterprise.

This study is an assessment of the microeconomic activities of Ghana’s market women. It employs an interdisciplinary approach, combining quantitative and qualitative research methodologies, to shed light on the factors driving Ghanaian women to operate in informal markets as traders. The first section is an overview of female labor force participation in developing countries. It touches on opportunities and challenges in formal education and employment for women in low and middle income countries and assess commonalities for female labor market entrants in Sub-Saharan Africa. A detailed assessment of female economic participation in Ghana including the Global Gender Gap Index, an objective measure to evaluate national gaps in gender equality, concludes this section.

After exploring issues in the formal labor market that cause many women to turn to the informal sector, a rigorous study of microenterprise in Ghana constitutes the second section. An ordinary least squares (OLS) regression model was generated after cleaning data from a study where researchers gave cash and in-kind grants to male and female microenterprise owners in open-air markets in Accra and Tema, major urban centers in Ghana (Fafchamps et al 2014). This paper methodized data from that study to determine if female operated microenterprises outperformed their male counterparts. Once a big picture of microenterprise in Ghana’s informal economy is established through quantitative analysis, the third section uses a qualitative approach to delve into individual experiences of female microenterprise owners. After receiving IRB authorization, the primary investigator conducted semi-structured interviews and participant observations with a total of thirty female textile traders in Accra in July 2012 and August 2014. Once translated and transcribed, commonalities, viewpoints and experiences of Ghanaian market women gathered through recorded face-to-face inter-
views are presented in this section. The study ends with a conclusion consisting of key findings and a critical assessment of its strengths and weaknesses.

**Gender-Based Market Trends in Developing Countries**

Employment and wage trends of female labor market participants in developed countries have been well studied. Although there is less research on the experiences of working women in developing countries, this is also a quickly growing field. Some global trends have emerged from the literature that can shed light on the conditions many women face as they operate in the formal labor market.

One important relationship that has been identified is that economic growth does not necessarily reduce gender-based employment and wage gaps. Although a country may be growing robustly, sectorial segregation, wage structures, labor market liberalization, and institutional networks may all be factors affecting the employment opportunities and wages for a woman relative to her male counterpart. Another similarity all regions share is the high rate of female participation in part-time work. This may serve as another contributor to the gender gap because this job type as well as low-skilled positions are characterized by higher gender-based disparities in wages (Ñopo 2012).

Compared to advanced markets, fewer studies on trends in gender-based discrimination have been conducted in developing countries and formerly socialist emerging markets partly because reliable and consistent longitudinal data on earnings is scant. Some ground-breaking studies, however, have materialized over the years. For example, a 1994 study concluded that, on average, women in developing countries are concentrated in low-wage labor in the formal and informal economy and experience larger wage gaps (Blau 2008). Just as female labor market participation rates fluctuate considerably (62% in the Sub-Saharan Africa region, 31% in South Asia, and 25% in the Middle East and North Africa region), trends in the gender-wage gap also vary (World Bank 2014). Some of the factors that determine female labor market outcomes include the structure of a country’s labor market, attitudes and beliefs about a woman’s role in society, and the attributes and experiences that make an individual labor market entrant competitive for hire.

In the case of labor markets, structural transformations may play a significant role in advancing employment opportunities for women, allowing them to earn higher wages. After studying trends in female labor force partic-
ipation and wages from 1987 to 2008 in Brazil, Mexico, India and Thailand, researchers concluded that increases in female employment and higher wages in these countries were the result of the labor market restructuring from high levels of physically demanding jobs like farming (brawn intensive) to jobs in the service sector that required more intellectual input (brain intensive). Women may now have more opportunities to participate in the labor market because there is less demand in brawn intensive jobs in which men have a comparative advantage. Improvements in women’s human capital has also helped to increase their overall labor market participation rate and narrow the wage gap in these developing countries (Randall 2013).

Increased employment opportunities in skill-based labor is an encouraging trend; however, in many developing countries, the average woman has fewer years of formal education relative to her male counterpart. Using socio-demographic characteristics to match males and females and allowing gender disparities to be computed only among individuals with the same observable characteristics, researchers produced a study on gender disparities in labor earnings for sixty-four countries. In South Asia, they concluded that the highest earning gap was among individuals with little formal education, a large fraction of whom were women. High earning disparities along gender lines were also reported in the Middle East and North Africa (MENA) region in the case of younger women (ages 15-24), women with little formal education, and part-time or over-time employees (Nopo et al 2012).

GENDER-BASED LABOR MARKET TRENDS IN SUB-SAHARAN AFRICA

In the Sub-Saharan Africa region, female labor force participation tends to be very high. Robust labor force participation, however, has not translated into higher female wage earnings. One factor preventing women from earning higher wages is human capital.

Despite improvements in literacy rates, there is still a large fraction of women with no or very little formal education and training. Low-skilled women are highly concentrated in informal and unpaid work in the service and agriculture sectors. In addition to receiving low wages to support themselves and their families, women who earn a subsistence wage through agriculture or in the informal service sector are at risk of considerable health issues because of the physically demanding nature of their work (Nopo et al 2012).

For women with formal education and technical skills, labor market structures may impede them from advancing in their careers. Limited access
to global markets constrains capital flows in the region making it harder for entrepreneurs to start and grow businesses. A smaller number of medium-sized and large firms relative to other developing regions like Latin America means that access to employment opportunities is very constrained. Furthermore, African labor market entrants must rely more on their own familial and professional networks rather than skill-based merit in acquiring employment. Without a robust private sector to generate living wages, the only alternative for formal employment is the public sector. Employment opportunities in the public sector, however, have become increasingly scarce due to public sector spending cuts. A fragile private sector and a shrinking public sector constitute considerable obstacles for African female labor force participants (Overa 2007).

Widely held social views about what constitutes “women’s work” is another factor limiting employment and wage opportunities for African women. Several studies have concluded that African women, beginning in their girlhoods, are conditioned to view employment in the public sector as teachers and nurses as ideal career goals. Males, on the other hand, have more liberty when it comes to job aspirations (Appleton 1999). This social grooming contributes to gender-based segregation in professional fields. Self-selection into “traditionally” female professions may result in higher earning gaps between men and women because male-dominated professions generally have higher wages.

**CASE STUDY: GHANA**

In Ghana, economic participation has developed over time with historical changes in the structure of the economy. These factors include territorial expansion of European powers, the development of the commodity export market (i.e., the mining industry), infrastructural development and urbanization, the development and expansion of the national government, and developments in the education system (Overa 2007). Before delving into female economic participation in Ghana, it is important to note that the country is incredibly diverse. There exist about seventy different ethnic groups, each espousing different indigenous cosmologies, societal practices and gender norms. Although English is the national language, there are several dozen languages—the most widely spoken being Ewe, Ga and Twi. Colonial experiences also vary. In the northern regions of the country, trade and interaction with Arabs resulted in the transfer of Islamic religion and cultural practices.
The ethnic groups residing in the southern coast interacted more with Europeans and practice Christian traditions. Though there are nuances and a mixture of colonial and indigenous beliefs and practices, this layered identity has impacted gender norms among different groups throughout the country. In major cities, individuals from different ethnic, religious and linguistic backgrounds live side-by-side with foreign nationals. Living in metropolitan or rural areas also shape gender attitudes and beliefs. The qualitative portion of this study takes place in Accra, the country’s capital on the southern coast, so the focus will be on the experience of women living in this southern coastal cosmopolitan center.

GENDER-BASED LABOR MARKET AND EDUCATION TRENDS IN CONTEMPORARY GHANA

Much of Ghana’s contemporary labor market structure has its origins in the colonial era. As a former colony of England, the Gold Coast, as Ghana was called from 1821 until 1957, existed to meet the economic needs of its colonizer. The extraction and export of natural resources like gold, cocoa, rubber and minerals was the principal form of production. To facilitate this system, the colonial administration employed local populations. Men who were formally educated by missionaries composed of the highest echelons as clerks and administrators. Few women could be employed in such positions because most were barred from receiving a formal education. The few privileged women who received a colonial education learned skills to keep house such as cleaning and cooking (Overa 2007).

During the post-World War I era, more women could receive a formal education to acquire the skills necessary for employment in the public sector. To a lesser extent, private sector firms also employed women in various capacities. Although the colonial administration perceived female participation in the formal labor market as incompatible with their duties as mothers and wives, the administration maintained an equal pay for equal work wage policy. Rather than manifesting itself in wage differentials, the perception that women were inefficient workers because of their biological differences and their socially assigned roles was articulated in terms of job security. Laws like the Pensions Ordinance of 1950 legalized the practice of forcing married and pregnant women to resign from their posts with some exceptions for nurses (Greenstreet 1971).

Since the colonial era, societal perceptions about Ghanaian women have changed. In most parts of the country, the exception being the northern re-
gion and other rural areas where poverty remains rampant and people adhere to conservative gender norms, young girls are encouraged to attend school just like their male counterparts. Per the United Nations Girls’ Education Initiative, in 2005 Ghana’s national primary gender parity index (GPI) improved from 0.93 to 0.95. This increase in girls’ enrollment can be attributed to government policies like the national abolishment of school fees and the creation of a capitation grant for all basic schools. In rural areas of the country, poverty and deeply held biases against females still impair young girls from building the foundations they need to become efficiently productive economic agents (UNGEI 2006). Although the country has made considerable progress in achieving equality of opportunity for both males and females in terms of primary education, there is room for improvement in establishing parity in secondary and tertiary education.

MEASURING GHANA’S GENDER INEQUALITY IN THE LABOR MARKET

Differences in outcome for men and women in the labor market have ripple effects in the overall economy. When there is unequal access to employment opportunities or unequal wage distributions, which negatively impact women, this results in women being less financially independent and having less access to resources to invest in themselves and in their children (especially the girl child). A pernicious cycle is created when a country’s education system does not prioritize female skills acquisition and hiring firms practice discriminatory behavior that disfavors women. Often, this results in labor market segmentation with low-skilled women being concentrated in low-wage work. Although it may suffice to analyze literature on the overall level of gender-based inequality is in Ghana, a more constructive means of detailing this information is to use an objective measure.

Created in 2006 by the World Economic Forum to estimate gender-based disparities and track their progress, the Global Gender Gap Index (GGGI) serves as an instrument to measure gender inequality across countries. Essentially, the GGGI evaluates countries based on what they have been able to achieve overall in regards to gender equality by adjusting for input differences. The Index is based on measures of educational attainment, health and survival, political empowerment and economic participation and opportunity. Measurements of gaps in gender equality are used instead of measuring countries based on levels of gender equality to account for differences in development levels between countries. In other words, the Index assesses out-
puts, not inputs, and judges a country’s progress in gender equality based on the outcomes they have produced irrespective of that country’s resources.

To remain impartial, the Index ranks countries based on their proximity to gender equality, not women’s empowerment. The scale ranges from zero (completely unequal) to one (complete equality). In the 2014 GGGI country rankings, Ghana was ranked 101 with a total score of 0.6661 out of one or about 66.6 percent. During that year, 142 countries were assessed and although Ghana was placed at the lower end of the pool, it ranked ahead of industrialized countries like Japan and South Korea as well as developing countries like Nepal and Egypt.

The Economic Participation and Opportunity Gap, a sub-index of the GGGI measures gaps in participation, remuneration and advancement. This measure determined that the gap in labor force participation between Ghanaian men and women was very small. Throughout the time the data was collected, women were very active in the formal and informal labor markets, participating at an average rate of 96%. These findings are consistent with studies from the World Bank, the International Monetary Fund, and the International Labor Organization which report female labor force participation rates as being consistently high in the Sub-Saharan Africa region. A 2013 IMF study determined that while global female labor force participation had stagnated at around fifty percent, rates in Sub-Saharan Africa consistently hovered around sixty percent and, as of 2000, increased to rates of around sixty-five percent (Elborgh-Woytek et al 2013). Although Ghanaian women are just as active as men in labor market participation, there exist considerable gaps between earned incomes. Despite the years when the gap lessened, the general trend appears to be that income disparities have grown incrementally over time.

In the case of gender-based discrimination, employer practices may favor or disfavor female candidates. An example of positive discrimination against females is an oil firm selecting women to work as fuel dispensers because they view them as being more honest and providing better customer service compared to male candidates. Although it qualifies as coercion on the part of the employer since he or she is in a higher position of power, positive discrimination may also come in the form of female candidates being expected to engage in relations (sexual or otherwise) in exchange for a job title. Few national laws address discriminatory practices in Ghana. Without effective laws to regulate employer behavior, labor market discrimination has remained a pervasive problem (Dwomoh et al 2015).
A 1999 World Bank report provides a detailed empirical analysis of gender-based labor market outcome discrepancies in Ghana. Using parsimonious regression analysis, the study measured the magnitude of gender-based discrimination and determined how union membership, the manufacturing sector and firm location affected labor market outcomes. Data for this study came from the 1994 Regional Enterprise Development (RPED) Survey which covers 215 manufacturing firms ranging from micro to large businesses with respondents from 1,200 employees from the metal, textiles, food, and wood industries. Female workers comprised about 17% of the sample. To provide additional detail on worker experience, ten randomly selected workers from different occupational categories were also interviewed. Most of the sampled firms came from two of Ghana’s largest cities, Accra and Kumasi. Results from the study yielded mixed results.

Although estimates for the wage and productivity gaps were significant, the productivity gap was higher than the wage gap. On one hand, the regression analysis concluded that on average, women were paid statistically significantly less than men controlling for group level differences in qualifications and other characteristics. This wage gap was most notable in the manufacturing sector where female workers were paid 17% less than their male counterparts. Female productivity, on the other hand, was not on par with that of males. Accounting for differences in qualifications, occupation as well as sector of occupation, it was estimated that female workers were 37% less productive than their male counterparts. This could suggest that the lower pay for women is the result of their lower productivity, however; several other factors were tested and some were consistent with discrimination whereas others were not. Such mixed results may reflect the fact that women are usually employed in lower-paying occupations that are often less productive compared to jobs in which men are employed (Verner 1999).

Microenterprise as a Solution to Limited Formal Labor Market

Despite constrained private markets which limit job opportunities as well as structural barriers to employment in the formal labor market, many Ghanaian women are proactive in generating income for themselves and supporting their families. A viable alternative for women who were squeezed out of the formal labor market and prevented them from receiving adequate formal education and training because of societal gender bias was to carve out space for themselves in the informal labor market through microenterprise. Often these businesses start and end as subsistence enterprises because female en-
trepreneurs lack capital from financial institutions to grow their businesses (Fafchamps et al. 2014).

Trading goods and services in open-air markets was once considered a traditionally feminine occupation and has been historically documented. Although they existed before their arrival, as early as the seventeenth century, Europeans provided a written account of the sophisticated trade networks developed by Ghanaian women (Overa 2007). Since then, women have continued to be very visible in market trade; however, unemployment and underemployment following a debt crisis and structural adjustment policies in the 1980s and 90s have caused some Ghanaian men to turn to selling goods in the informal economy as well. Their growing presence constitutes increased competition in an already saturated market. Since informal trade is primarily a woman’s domain and female traders have developed dynamic networks such as commodity associations, it is expected that female-owned firms will perform better than those owned by males. This assumption will be rigorously tested using a parsimonious regression model.

Data for this analysis comes from a randomized impact evaluation investigating microenterprises and the flypaper effect in Ghana (Fafchamps et al., 2014). The raw data from this randomized experiment consisted of responses from over 900 male and female microenterprise owners. Since the sample is so large and was generated randomly, it may be analyzed using the OLS regression model. After cleaning the baseline data, including removing outliers, the sample was reduced to a total 119 respondents, including 43 men (36.13% of the sample) and 76 women (63.87% of the sample). In comparing business performance between male and female microenterprise owners, ten variables were tested.

VARIABLES USED IN MODEL

Variables used in the model pertain to two categories, business factors and demographics. Since this study seeks to determine whether being a male or female influences business performance as indicated by profits, gender is a primary variable included in the model and is expressed as $\text{Fem}$, a binomial variable with 1 indicating female and 0 indicating male. Age is also an important variable because it may serve as a proxy for experience. Marital status ($\text{MarSta}$) and competed years of education ($\text{Educ}$) constitute the other variables used to detail the characteristics and human capital attributes of microenterprise owners. The following variables were used to represent business factors: number of businesses owned by respondent ($\text{Bus_Count}$), total
sales for September 2008 (\textit{Mon\_sales}), association membership (\textit{Assoc}), land or market space used by business was purchased by owner (\textit{FixCap\_Land}), VAT registration (\textit{VAT}) and cash on hand for business (\textit{Cash}). Age, completed years of education, cash, number of businesses owned by respondent and September sales are all continuous variables. Association membership, whether the land or market space was purchased by owner and VAT registration are all represented as binomial variables with 1 indicating “Yes” and 0 indicating “No.” Lastly, marital status was expressed as a categorical variable with 1 representing married, 2 representing single/never married, 3 representing divorced, and 4 indicating that the respondent was widowed.

**DESCRIPTIVE STATISTICS AND CORRELATION**

The average ages for women and men were about 33 years and about 35 years respectively. In respects to education, female traders had an average of about 7 years of formal education whereas men had an average of about 9 years. It was expected that men would be, on average, more educated than women because social norms regarding education for this generation highly favored males. In regards to marital status, most women (about 61%) and men (about 60%) were married. This information shows that for most participants, profits earned were spread across other dependents, including their spouse, since child birth and rearing is the objective of most Ghanaian marriages.

When it came to business related variables, men and women had about the same amount of sales for the month of September (about 57 USD). Women however, had more cash on hand (about $40.50) compared to their male counterparts (about $32.58). For men and women, very low levels of association membership were recorded. About 90% of women and 93% of men did not affiliate with an association. With more and more traders entering the market, it appears that associations have less power when it comes to price setting and advocating for policies making them less useful therefore they are losing their relevance and credibility among traders, especially new market entrants.

**MULTIVARIATE ANALYSIS OF FIRMS’ PERFORMANCE**

A multivariate regression was used to examine firm performance using profit as a proxy. Although about only 15% of the variation in profit was explained by the model (as indicated by the adjusted R-squared), the model can still be
used to rigorously study the microeconomic activities of male and female business owners in Ghana. The low R-squared may be a result of numerous other factors affecting profit such as the strength of demand and the state of the economy. Table 1 shows the regression results for all variables used in the model. Out of the ten variables, only two (Cash and Mon_Sales) were statistically significant as depicted by Table 2. Although gender was not significant in determining microenterprise performance, it is included in the table below because the primary objective behind conducting this regression was to determine if gender had an effect on firm profit.

Business factors, not gender, appear to be the most important for determining profits. Surprisingly, there was a negative association between cash on hand and profit. In other words, a one dollar increase in cash on hand resulted in a decrease in profit of about .133. For September sales (Mon_Sales), on the other hand, a one unit increase in sales for that month was associated with a .307 increase in profits.

The objective of carrying out this regression exercise was to determine if gender had an effect on profit. It was expected that because there are more female microenterprise owners who have more experience and deeper networks in the informal market, they would have more of an advantage when it comes to generating profits. This was not the case, as evident by the insignificance of the Fem variable. Although the results did not support the initial assumption, the statistical analysis helped to provide a more rigorous understanding of microenterprise in Ghana’s informal economy.

Qualitative Analysis: Methodological Approach

This portion of the study delves deeper into issues informal labor market participants face by investigating the motives and experiences of Ghanaian female business owners. A qualitative approach, including an analysis of interview responses and participant observations, is the primary mechanism of analysis. Prior to conducting these interviews, the primary investigator received IRB approval by acquired certification for Human Subjects Research in Social and Behavior Sciences from the University of Pittsburgh Center for Continuing Education in the Health Sciences in March 2012. To proceed with the next round in interviews in 2014, the researcher completed the CITI Program and received this license from the Collaborative Institutional Training Initiative at the University of Miami in June 2014.
<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
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<td>2008.25029</td>
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<tr>
<td>Residual</td>
<td>70716.6399</td>
<td>108</td>
<td>654.783703</td>
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<tr>
<td>Total</td>
<td>90799.1429</td>
<td>118</td>
<td>769.484262</td>
</tr>
</tbody>
</table>

# of observations = 119
F(10, 108) = 3.07
Prob > F = 0.0018
R-squared = 0.2212
Adjusted R-squared = 0.1491
Root MS = 25.589

| Profit Coefficient | Std. Err. | t     | P > |t| | [95% Conf. Interval] |
|--------------------|-----------|-------|-----|---|----------------------|
| Fem                | -9.966646 | 5.490552 | -1.82 | 0.072 | -20.84987 | 0.9165812 |
| Age                | 0.2455811 | 0.2500275 | 0.98 | 0.328 | -0.2500168 | 0.7411789 |
| MarSta             | 0.0016147 | 3.109993 | 0.00 | 1.000 | -6.162932 | 6.166161 |
| Educ               | 0.0809719 | 0.7733972 | 0.10 | 0.917 | -1.452035 | 1.613979 |
| Bus_Count          | -4.989054 | 13.8592 | -0.36 | 0.720 | -32.46039 | 22.48228 |
| FixCap_Land        | -8.301788 | 12.20636 | -0.68 | 0.498 | -32.4969 | 15.89333 |
| VAT                | 9.593117  | 30.43324 | 0.32 | 0.753 | -50.73085 | 69.91709 |
| Assoc              | -14.44968 | 9.305365 | -1.55 | 0.123 | -32.89453 | 3.995165 |
| Cash               | -0.1327871| 0.068202 | -1.95 | 0.054 | -0.2679752 | 0.002401 |
| Mon_Sales          | 0.3072713 | 0.0690132 | 4.45 | 0.000 | -0.1704752 | 0.4440673 |
| _cons              | 26.85706  | 22.22412 | 1.21 | 0.230 | -17.195 | 70.90912 |

Fem: Female, 1 = female, 0 = male
MarSta: Marital status
Educ: Completed years of education
Bus_Count: Number of businesses owned by respondent
FixCap_Land: Owner purchased land-market space used by business
Table 1. Regression Model (all variables)

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t</th>
<th>Sig</th>
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</thead>
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<tr>
<td>Constant</td>
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<td>22.22412</td>
<td>1.21</td>
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<td>Cash</td>
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<td>-1.95</td>
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</tr>
<tr>
<td>Mon_Sales</td>
<td>0.3072713</td>
<td>0.0690132</td>
<td>4.45</td>
<td>0.000**</td>
</tr>
</tbody>
</table>

F = 0.0018
Sig = 0.05
Adjusted R-Square = 0.149

Table 2. Statistically Significant Variables (*excluding Fem)

An original, semi-structured interview script consists of the first phase of the field study conducted in July of 2012. Ten female textile traders specializing in the trade of African print fabrics were selected as case studies because they trade a non-perishable good that is often in demand. During August 2014, phase two of the study, an additional twenty female textile traders were interviewed. Cultural traditions like weddings, child naming ceremonies and funerals, and individual preferences for prints with distinct patterns with cultural relevance insure that there is year-long demand for textiles. Market women facilitate transactions between the textile producer and the customer after the product has been made by serving as middle persons.

To gage their experiences operating a business, fourteen open-ended questions were issued. In addition to gathering information on motives for
starting their businesses and their understanding operating in the market, their views about government policy and Ghana’s future economic prospects were also discussed. Limited funding and time as well as expected higher rates of illiteracy among members of the targeted population made approaching potential participants at their work space and asking them to participate in the study themselves or to provide a referral the most effective recruitment method. Participants did not receive compensation for involvement in the study.

During the initial phase of the sample recruitment process, female traders were hesitant about participating. After thoroughly explaining research objectives while sharing professional credentials, potential participants felt more at ease with sharing their experiences. Since most of the women did not have adequate formal education which includes training in written English, an oral consent was administered, sometimes with the help of a translator. Participants were encouraged to answer with as much detail as possible. Interview questions were translated from English into Asante Twi or Ga, two of the most commonly languages spoken in Accra. Rather than asking participants directly how many years of formal education they received, since this question might make them uncomfortable, skill level could be gauged with mastery of the English language. This is because formal education is administered primarily in English. Of the thirty recorded interviews, only three were completely in advanced English and did not require any translation on the part of the primary investigator.

MAKOLA MARKET AS A WORK PLACE

Located in the center of Ghana’s capital, Accra, is Makola Market. Sprawling and bustling, this open-air market encompasses two commercial centers, Makola One and Makola Two, and can easily be mistaken for a city within the city. Although there are buildings in the vicinity, some of which are multistory department stores, crowds of shoppers spill onto the streets where they engage in transactions with sellers who are standing, sitting, or walking along the roadside. In parts of the open-air market, trucks and cars delivering goods pass along the same route. The space appears chaotic and disorganized, overrun with people and automobiles. The clusters of buildings and stalls are not in the best condition, many of them are dilapidated and in need of renovation. Makola and many other smaller commercial centers and open-air markets are in the jurisdiction of the Accra Metropolitan Assembly, the local governing body.
For many of the women interviewed, Makola has been their workspace for decades. The average number of years operating in the market for thirty interviewees was sixteen years. Many traders reported working twelve hour shifts or even longer hours. Several women described leaving their homes around 4 or 5 A.M. to travel to their workspace where they would stay until 5 or 6 P.M. This is how one respondent describe her work day:

“You wake up to go to the market at six you get off at four thirty or five. You sit down and you can't get anything sold and you go.”

Depending on the specific good being sold (i.e., packets of water or food-stuffs), trading can be a laborious endeavor. For those who can afford it or through inheritance, one can acquire a designated stall or a room or space in a building, allowing for space to sit and wait for customers. Those without stalls may sit or stand in a designated area. However, many traders balance heavy loads on their heads and walk around in search of customers. They must endure the noise and congestion of the shopping area, the powerful heat of the tropical sun, and, depending on the weather, rain or gusts of wind carrying dust.

Over the past two decades, there have been many changes to the market’s structure and the overall nature of trading. The physical facade of the market has been affected by fires; the last major one occurred in 2014 leaving Makola Two badly damaged. Overcrowding and congestion have also become problematic as rapid urbanization has increased Accra’s population. For rural to urban migrants relocating for economic opportunities, limited formal employment options makes selling goods in nearby open-air markets the only viable alternative. Many respondents who have been trading for several decades noted that Accra’s booming population has resulted in a saturated market, further increasing competition and making it harder to generate profit.

REFLECTIONS ON ECONOMIC AND POLITICAL CLIMATES IN 2012 AND 2014

Macroeconomic trends also directly impact conditions for retailers in this commerce zone. For example, although individual attitudes about future business prospects and trends in Ghana’s economy varied considerably, there was a palpable sense of optimism among women who were interviewed in
2012 when GDP was growing at a robust 8.8% and inflation (using consumer prices) was also at a low of around 9% (World Bank 2015). That year, President John Atta Mills suddenly died in the third year of his first term. Despite this unexpected loss, Ghanaians remained united and confident in their restored democratic system functioning effectively to replace top leadership. Robust growth and low inflation created a good business climate for female traders and resulted in many traders feeling optimistic about their short-term business prospects. As one respondent said:

“The nation is good; the government is good. The hand cannot cover all so they are doing their best.”

The sudden death of President Mills was seen optimistically by several traders. During this period of national mourning, traditional funeral cloth was in high demand and many textile traders expected sales increases. As one trader put it:

“Even the death of our president has given us some jobs. We are selling his cloth, we are selling trophies, everything. Both the members of the opposition and the ones in government, we are all making money. We have made money out of the funeral cloth. Everyone has made money out of it.”

As Ghana prepared for a change in leadership, with Vice President John Mahama temporarily taking over before another election was held, it was important to determine how female textile traders viewed the role of the national government in supporting their work. When asked about how they would manage the economy and the country if they were in a leadership position, responses ranged from the reduction of barriers to trade to the implementation of national policies that favored the advancement of women in governance such as a gender-based quota to improve female participation in parliament.

Several respondents felt strongly that maintaining high levels of economic growth would require reforms to trade policy that facilitated regional and international trade, fiscal policy that kept inflation in check, and reforms to the tax system. Many female textile traders advocated for community-specific reforms in the banking system, allowing the owners of microenterprises
to have greater access to financing at lower interest rates. Respondents also supported initiatives to make primary and secondary education free, since a considerable amount of traders’ earnings who had young children went towards paying school fees.

The summer of 2014 in Ghana was less politically charged than 2012 because a contested election had been decided in John Mahama’s favor and the opposition had conceded, but the country was experiencing considerable macroeconomic problems. The GDP growth rate (4.2%) was half of what it was two years prior and inflation climbed to around 15% (World Bank 2015). For many traders interviewed during that year, inflation was the primary concern. In addition to criticizing the national government for its failure to address volatile prices, some respondents reprimanded the local governing body (the Accra Metropolitan Assembly or AMA) for failing to meet their needs. Despite paying taxes, such as VAT, an annual income tax, and fees for operating in the market, traders felt they were not receiving adequate services. One respondent claimed that electricity had been out for the last four months and another asserted that the AMA had promised more accommodating facilities but had failed to carry through on renovations, including fans for market stalls.

MARKET ASSOCIATIONS AND COLLECTIVE ACTION EFFORTS

Irrespective of their personal views on local and national policies, it appears that many market women are politically aware and engaged in the democratic process. In 2012, as groundwork for the upcoming election was put into place, many of the women interviewed voiced their enthusiasm for participating. Although they participated in the democratic system as voters, some even influencing the votes of other members in their household, market women also acted collectively to convince their political leaders to act in their interests. One instance that was cited several times among respondents was the national government’s response to pressure from female trade groups by establishing a stronger security presence along the Ghana/Togo border to prevent illegal dumping of textiles. Additionally, a month or so before the field study was conducted in July 2014, there was a protest where many traders voiced their concern about Chinese nationals operating businesses in Makola Market. Traders who felt their dwindling profits were jeopardized by individuals selling Chinese goods at low prices could vent their concerns during this protest.
Collective action by market women has often been facilitated through market associations. Categorized by specific products (i.e. cloth and tomato sellers), market associations are well-structured entities that provide important services for their members. They manage their membership (estimates vary from several hundred to thousands) through sophisticated hierarchies including average traders and a counseling board with a president overseen by a queen of a specific product or commodity (i.e. Queen of the cloth sellers or Queen of the tomato sellers). Leadership ascension is merit-based and democratic, with lower level members voting long-term successful traders into positions of power.

In addition to serving as representative advocates to government leaders, associations and unions support their members by providing emergency finances (such as paying funeral expenses for a member’s relative) and advertising government and private loans. Rapid urbanization has resulted in more and more people selling goods and services in the informal economy as an income-generating mechanism. This influx of traders in the market has weakened the ability of market associations and unions to set prices or to limit the volume of products sold to influence members’ profits. For long-term union members, new traders who chose to forgo union membership are a major concern. As Mercy Djan, the leader of the cloth sellers (Queen of the Cloth Sellers) stated:

“Well the problem is...the problem is formally; we don’t have a lot of people on the streets selling so the business was very good because the business was limited. But presently, we have a lot of people on the street also selling the same thing we are selling in the market so naturally, business will be low.”

Conclusions

High female participation in labor markets should be received by economists and policy makers as a positive outcome. Theoretically, it means that working-age women seeking employment have found a means to generate an income. Trends in developing countries like Brazil and India show that labor markets are transitioning from physically demanding labor (brawn intensive) to work that requires more intellectual input and soft skills (brain intensive). This shift represents an opportunity for women to enter the market, compete with men, and earn their own income (Randall 2013). What appears to be a
robust labor market and an example of societal progress, upon closer inspection, may be an inefficient market for labor. In many developing countries, especially in the Sub-Sahara Africa region, high rates of female labor force participation are associated with a concentration of women in low-wage work in the formal economy or subsistence labor in the informal economy.

This appears to be the case for Ghana, an ethnically, religiously and linguistically diverse West African country with a British colonial legacy. In the post-colonial era, the country has made considerable progress in achieving gender parity in primary education but there is still room for growth in higher education. Females can now acquire the foundations for formal skills and training like their male counterparts but outcomes in the formal labor market are not the same. Inefficient firm behavior like gender-based discrimination remain pervasive because the legal system does not effectively address it. A gender wage gap, supported by a rigorous study that determined female workers in the manufacturing sector are paid 17% less than males (Verner 1999), may also be underreported nationally. Despite these obstacles, per the Global Gender Gap Index (GGGI), Ghanaian women exhibit high rates of economic participation. The informal labor market, not the formal one with higher wages and greater job security, may account for this.

Trading goods in the informal market is not a new development. For centuries, Ghanaian women have turned to enterprise in open air markets to generate income. In the last two or three decades, urbanization and the relocation of citizens from other regions (especially the Northern) to southern coastal urban centers like Accra has caused urban, informal markets to become saturated, further limiting profits for individual sellers. Since women have a rich legacy of being traders, this paper seeks to determine if gender influenced profits.

Using a multivariate OLS regression, the hypothesis tested is that female traders will outperform male traders because open-air market trade is “woman’s work.” Data came from a randomized experiment assessing behavioral outcomes of male and female microenterprise owners in Accra and Tema after they received either cash or an in-kind grant (Fafchamps et al 2014). After reducing the baseline data—consisting of responses from over 900 participants—to 199 respondents (43 men and 76 women), ten variables were tested on profit (a proxy for firm performance): gender (Fem), age (Age), marital status (MarSta); completed years of education (Educ); number of businesses owned (Bus_Count); land/market space ownership (FixCap_Land); VAT registration (VAT); association membership (Assoc); cash on hand (Cash); total sales for September 2008 (Mon_sales).
Results show that gender did not have an effect on profit. Of the ten variables, only two business factors (Cash and Mon_Sales) were statistically significant. Cash on hand had a negative relationship to profits, while sales in September 2008 had a positive relationship. Although the regression results did not support the hypothesis, this exercise was useful for analyzing demographic characteristics and factors affecting Ghana’s microenterprise owners using concrete data and not just theory and antidotal evidence. The descriptive statistics are particularly insightful. As theorized, women in the sample had on average less years of formal education (7 years) relative to their male counterparts (9 years). Surprisingly, there were very low rates of market association membership. Ninety percent of women of the surveyed women and ninety-three percent of men were not affiliated with a market association.

After providing a broad view of the type of people who turn to microenterprise in the informal labor market to generate income, commonalities, experiences and viewpoints of female traders were presented. With IRB approval, the primary investigator conducted interviews and participant observations with 30 market women in Accra’s Makola Market—one of the largest open air markets in the country. Using English language skills as a proxy for skill level, it was determined that most of the female traders (27 of the 30 interviewees) were low-skilled or had very few years of formal education. Despite their limited formal training, the participants were well-versed with contemporary macroeconomic issues and politically engaged citizens. They expressed their concerns about rising inflation and the failure of local and national government to provide them with services such as renovating Makola Market despite the payment of VAT and other taxes and fees. High-level market association leaders stress the importance of their organizations for collective action like lobbying government to address border control, providing funding in times of crises, and raising awareness about financing like microloans. They acknowledged that an influx of traders had made trade in the market more challenging and further reduced profits for members.

This study constitutes a detailed analysis of the opportunities, challenges and experiences of Ghanaian working-class women. Multidisciplinary research design combining quantitative and qualitative approaches offers a both a broad view using data and fine details using interviews. In the presentation of the study’s process and findings, the quantitative overview is established first and is followed by the qualitative section. In conducting the study, interviews and participant observations were completed approximately one year before the quantitative analysis. Had the time frame been reversed,
questions used in the semi-structured script would have focused more on microeconomic issues, including details on individual profits and assets, financing and competition between more established traders, and recent market entrants. The study in its present form is a rigorous, detailed analysis of female economic agency in Ghana and provides insight into the challenges and experiences of working women in a developing, Sub-Saharan African country.

**Bibliography**


"ENCHANTMENT DISSOLVED": A REEXAMINATION OF THE HYMN’S AUTHORSHIP AND SIGNIFICANCE IN THE COMMONPLACE MS. HANNAH SWYNOCK

HANNAH BRADLEY, DEPAUW UNIVERSITY
MENTOR: TAMARA STASIK

Abstract

“Enchantment Dissolved” is a hymn written by John Newton and a part of the first publication of the *Olney Hymns* in 1779. However, starting around the year 1803, the hymn was misattributed in multiple publications to William Cowper, the second author of the collection. This article will analyze Cowper’s literary style and consider why the hymn may have been mistaken for his creation. This particular hymn also appears in a 17-18th century commonplace, Hannah Swynock 1687, in the Parker MSS. at the Lilly Rare Book Library at Indiana University. In this hand-written manuscript, the hymn has four additional verses that are not found in print. This article also analyzes those four verses in comparison to the original five to determine whether the author of the addition was mimicking the style and themes of “Enchantment Dissolved.” Commonplaces had many uses and sometimes multiple scribes or purposes, so it can be difficult to draw conclusions from one entry. However, theorizing about the source and purpose of this hymn and its addition in the context of the manuscript is important for understanding how the commonplace was used and by whom.

William Cowper and John Newton’s noted close collaboration on the *Olney Hymns* during the 18th century has been previously studied, but their joint authorship calls into question the authorship of individual hymns. Of particular interest is “Enchantment Dissolved,” published in the first edition of the *Olney Hymns* in 1779 under Newton’s name, but under both Cowper and Newton’s names in later publications (Newton 603, Cowper 331). Due to their increasing popularity, more than 37 editions of the *Olney Hymns* were
published in several countries, including England and Scotland. “Enchantment Dissolved” and its authorship are of particular interest due to the hymn’s appearance in a 17th/18th century manuscript commonplace book that includes four additional verses of unknown origin. Investigating the authorship and background influences of the hymn may help embed this part of the manuscript in place and culture, suggesting the potential intentions of the scribe and compiler. This single page of the Swynock commonplace gains meaning through a stylistic comparison of the hymn and Cowper’s own work, an analysis of the four added verses, and an integration of those ideas into the context of the manuscript as a whole.

This commonplace is housed at the Lilly Rare Book Library, Indiana University, is inscribed with the name Hannah Swynock on the first page, and is dated 1687/8. The majority of the hand-written text, numbering more than one hundred pages, is followed by a large section of blank pages after which the manuscript book is flipped upside down and written from the opposite end. This smaller section is made up of approximately twenty written pages. On the fourteenth page from the back of the book, written upside down from the majority of the entries, is an extended version of “Enchantment Dissolved,” though it remains untitled in the manuscript itself. This hymn is placed in a section of twenty-six pages of handwritten texts at the back of the book, which may have been written at a later time than the rest of the commonplace because of the physical separation between these sections and difference in scribal hands.

This hand-written version of the hymn not only includes the first five stanzas that are found in the Olney Hymns published in 1779, but also four more stanzas of uncertain origins that appear to be a new or extended

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It may even be possible to trace the textual changes and differences of this hymn between editions of Cowper’s poems to determine which source the commonplace inscriber copied from. This is not an exhaustive list of the places where “Enchantment Dissolved” has been printed under Cowper’s name.
ending. Since these four stanzas have not been identified in any published edition, their authorship is uncertain and may be the product of the commonplace scribe. Therefore, these added verses raise several questions about the purpose and intention of the addition, their expected audience, and how they contribute to the manuscript as a collection of texts. Rather than simply copying interesting texts for later reading, the scribe may have become an author, signaling an alteration in the user’s relationship with the commonplace. The intention of commonplaces varies depending on the user of the book, how they chose to organize the text, and the specific choices of entries, as well as original or personal texts. Currently, little is definitively known about the scribe or purposes of the Swynock commonplace, but this poem and its addition may shed light on the religious interests and literary background of the scribe(s).

Newton and Cowper

John Newton and William Cowper shared the Evangelical faith and came to the religion in unconventional ways, but more important were their contributions to the religious literature of their time. Newton ran a slave ship before repenting and changing paths to become the preacher at Olney Parish in Buckinghamshire. Cowper was a gentleman who strove to work in government and the law. However, he suffered from lapses in sanity that would not allow him to pursue a career, but he found faith through conversion at an asylum and moved to Olney after meeting Newton. Despite their disparate histories in Evangelicalism, they shared similarities in their personal narratives. They enjoyed nature, reported dramatic religious conversion, suffered the early loss of their mothers, and had near-death experiences (Huntley 31). Newton was a preacher whose Calvinism was “no sterile system of theology but was warm and practical and was cherished by Cowper, as was the bond that united them,” according to John Cromarty (q. in Spacks 3). Indeed, Newton’s theology was more moderate, which made him very popular even with other groups, such as the Baptists who asked him to speak at gatherings. One possible difference between their poetic styles is that Newton wrote his hymns for congregational use, whereas Cowper was
not motivated by duty, but rather for personal enjoyment and later to fulfill an obligation to his friend to help finish the *Olney Hymns.*

Newton and Cowper may have had slightly different audiences; Newton’s hymns were created for direct use in his parish, while many of Cowper’s creations were created out of personal interest as he worked through his religious doubts, though he later edited and wrote many for publication in the collection. In *William Cowper’s Olney Hymns: A Literary Study,* Edna Zapanta-Manlapaz compares two hymns—one by each author—with very similar themes to distinguish the two authors’ styles. Zapanta-Manlapaz describes Cowper’s version of the hymn as having more “poetic compression,” which means that Cowper’s hymn jumps to the point of the hymn faster and skips certain progressions of ideas (213). For example, the two hymns Zapanta-Manlapaz compares depict a Christian questioning his love of God. She remarks that Cowper brings up his “contrite heart” in the second line while Newton detours, talking about his “anxious thought”. They both go on to use rhetorical questions about faith, but Cowper’s are much more straightforward (211). Zapanta-Manlapaz also praises Cowper’s ability to skip portions of thought-process, while Newton goes through many steps of self-argument and questioning of others and even God to reach the same conclusion (211-12). Overall, Zapanta-Manlapaz finds Cowper’s hymns more concise and powerful because they do not spend much time considering alternatives or progression, but go straight into the point.

According to Marylynn Rouse, director of The John Newton Project, the hymn “Enchantment Dissolved” is undoubtedly Newton’s creation because it was found in his diary during a time that Cowper was known to have been sick and taking a break from work with the hymns. Rouse believes the hymn may be a response to the arrest of a Dr. Dodd for forgery, an account related in Newton’s diary around the same time of the hymn’s creation (16. Feb.

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2 Interestingly, there are few resources for literary analysis of Newton’s hymns or poetry. The only relevant sources found in MLA International Bibliography under the subject John Newton are as follows:

Bilbro, Jeffrey. "Who are Lost and how They're found: Redemption and Theodicy in Wheatley, Newton, and Cowper." *Early American Literature* 47.3 (2012): 561-89.


1777). It is possible the hymn may have been intended for use in Newton's parish to discuss the event. Despite Newton's enduring success with "Amazing Grace," Cowper became equally famous and arguably a better poet in the years following the *Olney Hymns*. In his 1999 article "Grace in Affliction," scholar John Cromarty states that Cowper is "remembered as 'the poet of the Evangelical Revival'" (qtd. in Aalders 40). Cowper was frequently read and published starting with his longer works "The Task" and "John Gilpin." Cowper’s contemporary fame makes it helpful to consider the ways the hymn "Enchantment Dissolved" lines up with Cowper's style to understand how publishers and laymen might have confused it for his own. This confusion in turn invites informed speculation about whether the commonplace compiler thought they were copying a hymn by Cowper or Newton.

**Cowper as Hymnist**

"Enchantment Dissolved" appears in Hymnary.org, an NEH-endowed comprehensive index of Christian hymns, as "Blinded in Youth by Satan's Arts," the first line of "Enchantment Dissolved." The hymn is titled "The enchantment dissolved" in the first printed edition of the *Olney Hymns* in 1779 (Newton 301). However, Hymnary.org attributes the hymn to William Cowper and notes its appearance in three hymnals from around 1825 until 1840. Interestingly, the database does not cite the hymn's title as "Enchantment Dissolved," as it may not have been titled in those later editions, but rather uses the first line as an identifier; the entry in the Hannah Swynock manuscript itself is likewise untitled. The literary similarities between this hymn and Cowper's other works can help to determine why "Enchantment Dissolved" was mistaken for his verse. Specific dates for most of the Swynock commonplace entries are currently unavailable, but it is possible that the copied portion of the hymn comes from one of the later editions attributed to Cowper. There is no attribution of the hymn in the commonplace to either author, so the date and location of the scribe may be the best indication of what edition was copied. Currently none of the identified entries in the commonplace come from the *Olney Hymns*, Newton, or Cowper. Even though the manuscript is first dated 1687/8, the hymn found in the back of its pages was first published in 1779. These dates indicate that the commonplace was created and used over the course of a long

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period of time and one of the compilers may have wanted to include and mimic Cowper in their commonplace.

Cowper used specific devices and writing styles to portray personal reflections on religion and struggles of faith. According to Cindy Aalders, author of an article on William Cowper’s *Olney Hymns*, a peculiar and principal characteristic of Cowper’s style is “his introspective tendency to probe his own religious experience in verse” and that was “not motivated by professional duty” (43). Indeed, Cowper was practically a man of no profession because he lived at the charity of his family and Christian families such as the Unwins and Newtons who took him into their homes (Thomas). His primary motivation for writing the *Olney Hymns* was the insistence of his friend John Newton. Therefore, Newton’s and Cowper’s hymns came from slightly different places. Cowper experienced a number of emotional breakdowns, many of which were related to his religious struggles. This introspection and “perception directed within” makes Cowper “one of the most subjective of English poets” and his hymns touch on “religious and primitive fear,” a “unique quality for poets of his time” (Spacks 165). Presence of similarly introspective or personal writing in “Enchantment Dissolved” may have confused readers about its authorship because this characteristic might normally have distinguished Cowper from Newton.

“Enchantment Dissolved,” as it appears in the commonplace, exhibits evidence of self-doubt and fear, but in a less personal way than much of Cowper’s poetry. The first two stanzas of the hymn describe a worldview in which people are blinded by Satan and see the world as a place of “gay delights & golden Dreams” (5). However, in the third stanza “the charm dissolves” and humans are left in the “Desarts dreary waste” (14, 7). As it turns out the charm is a sort of trick:

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5 This text is my transcription from the photographs taken during my 2015 student-faculty summer research project “The Lord Chancellor and the Maiden: Commonplace Books and Everyday Life.” The image number corresponds to the current name of the image’s file, but those numbers are slated to change in the future. The images are being reorganized to match the page-order of the manuscript, and will soon be renamed to reflect that order. However, the second number, after the underscore, will remain the same after this renaming. Therefore, it will be possible to find the same images I reference here by looking at that second number.

Hannah Swynock Commonplace Photographs, Lilly Rare Book Library, Indiana University. Personal Photograph by Dr. Stasik, Hannah Bradley, Jin Kim, and Evan Zelesnik. 2015. Image 014v_0192
Thus if the Lord our Spirits touch  
The World which promis’d us so much  
A Wilderness is found. (16-18)

Here, the speaker appears to be accusing the Lord of a kind of bait-and-switch; as though a person might get caught up in religious rapture, thinking that the world is a wonderful place, only to find those effects fade and be caught in a wasteland. This kind of writing may exemplify what JR Watson calls “ironic undercurrents” in Cowper’s writing (46). This progression of ideas runs parallel to Cowper’s own struggles with a religious life that was full of joy and doubt. The world might actually seem like a much better place when “blinded by Satan” because religious understanding and the Lord’s touch dissolves the “Castles & Groves & music sweet” (1, 10). In other words, enlightenment might actually mean that everything pleasant about the world is revealed to be an illusion, meant only to ensnare.

The hymn is not entirely negative; in the middle of the fourth stanza there is a turn towards the salvation of the speaker and all people. After a period of conviction that they “never can have rest / In such a wretched place” the Lord “Reveals his own Almighty Arm / And bids us seek his face” (23-24). These lines imply the “touch” that revealed the ugliness of the world was only a small part of the Lord’s power because the Lord also has strength in his arm and power in his visage. In other words, what seemed like tragedy and a negative power turns out to be a small reality that must be seen before we can “begin to live indeed! / When from our guilt & bondage freed” (25-26). The full power of the Lord is revealed and the “guilt and bondage” that blinds us is removed. Only then does the speaker believe people can truly live even though he says nothing of beautiful “dreams” or “castles,” implying that religious revelation is much more real and simple.

Though the themes and progression of ideas are similar to Cowper’s style, there are a few deviations from his typical clarity and self-reflection. In a similar hymn by Cowper titled “The Heart Healed and Changed by Mercy,” the speaker is also blinded by sin and fear but that period of uncertainty lasts much longer and is expressed more earnestly (Cowper). In “Enchantment Dissolved,” the distress lasts three lines and is prompted by the introduction “At first” that indicates the state will not persist, whereas in “The Heart Healed” sees the speaker unmoved by preachers, fasting, or a hermitic lifestyle—and only falls at God’s feet in the last five lines. Similarly, “Enchantment Dissolved” explicitly states that from the moment we see the Lord’s face it is certain that we will “follow him from day to day/ . . . /And

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Glory at the End” (28, 30). There can be no disputation about whether the speaker and everyone else will be saved: the doubt is eradicated. In Cowper’s hymn, the final statement is simply put: “thy sins are done away” (298). As a last line, these words do not imply that trials and tribulations are at an end, only that these sins, in this situation, are forgiven. The hymn “The Heart Healed and Changed by Mercy,” published under Cowper’s name, does not give the sense of absolute finality as the five stanzas of “Enchantment Dissolved” do.

Another dissimilarity between the two hymns is the use of first person pronouns versus inclusive pronouns such as “we,” “us,” and “our.” “Enchantment Dissolved” uses inclusive and second-person pronouns, distinct from Cowper’s typical use of first person pronouns for self-exploration. Cowper’s insistence on making no assumptions about others’ religious experiences in “The Heart Healed and Changed by Mercy” makes its meaning more straightforward and clearly introspective. “Enchantment Dissolved” shifts from speaking for the audience to a generalized second person “he” or a “Traveller” on the journey of life who is touched by the Lord, and then returns to using “we” and “our” (11, 12). This shift of pronouns can be confusing to the reader, especially because the poet then speaks about the Lord with second person pronouns again in the fourth and fifth stanzas. Even though the use of second person pronouns for the Traveller and the Lord may draw parallels between the two or outline their stark differences, this effect is perhaps in line with Cowper’s complicated relationship with clarity. As Zapatan-Manlapaz suggests, Cowper’s poetry can exhibit great poetic compression but also extend metaphors beyond comprehension. Therefore, it is hard to make generalizations about the clarity of his style as it varies across poems and different kinds of figurative language.6

Some critics accuse Cowper of being too transparent, while others find his style more confusing or ineffective than illuminating. Edna Zapanta-Manlapaz analyzes Cowper’s use of metaphors and finds that “he usually constructs [them] in such a way as to render the identification between tenor and vehicle very explicit” and “practically spells out for the reader the equation between the two terms” (169). For example, in Hymn No. 17 he draws a connection between the Lord’s “mansion” and the hearts of Christians, and goes on to describe how that place is a safe “dwelling place”: he draws out the metaphors so much that they lose some of their meaning

She also points out that he rarely uses complicated metaphors, but opts for those with one prescribed meaning and he does “not always exhibit a masterful control over the use of metaphor” (182). Some aspects of “Enchantment Dissolved” fit into this description of Cowper’s style because many images fall flat or are rendered inert by being piled onto each other. Not only is the hymn titled with “enchantment,” but the author uses words such as magic pow’r, charm, and vision in a way that confuses the reader who was just told he is blind (8, 22, 14). The intention is clearly to create a metaphor between the blindness created by Satan and a certain view of the world, implying that in moral blindness the world appears beautiful. However, the reader may become confused as to whether the poet is describing the actual world as a vision or whether they should be envisioning another place entirely, one that is “enchanted.”

The impact of this progression from illusion to truth should peak when the real world is found false and the Lord shows the readers his face, allowing them to “follow him from day to day.” However, that reading is complicated by the repetition of words implying that the vision might be only that and not the real world at all (28). Scholar Patricia Spacks may support this reading, having suggested that Cowper’s metaphors “frequently seem to have a sort of fatality, to call one’s attention inexorably to the “original” rather than the “secondary sense” (171). “Enchantment Dissolved” falls into this category of overwhelming its metaphors with literal meaning in a way that hearkens to some of Cowper’s known poetical struggles because the author focuses on the meaning of physical blindness rather than the implied religious shortsightedness.

Cowper’s poetry most commonly deviates from analogical metaphors with synecdoche, which is present in this hymn (Zapanta-Manlapaz 181). Cowper often “uses the image of God’s hand to represent various facets of His personality” (181). Zapanta-Manlapaz offers examples demonstrating how Cowper frequently describes God’s body part, such as a “wondrous hand,” and gives it an explicit action, such as “support[ing] the weight of sea and land.” (181). But in “Enchantment Dissolved,” the use of synecdoche feels more literal than figurative because the device in lines 23-4—“reveals his Almighty Arm / And bids us seek his face”—is presented without any explanation of what those body parts mean in the context of the poem. Cowper once stated that “it is my labour, and my principle one, to be as clear as possible,” and yet many times his “meaning becomes shadowy” (Spacks 175, 169). Therefore, it is difficult to decide whether to hold the hymn up
against his stated purposes of style, or against modern judgements of its effectiveness.

If Cowper’s style and religious confidence is somewhat inconsistent, the religious themes and images he uses in the Olney Hymns are much more dependable. According to Zapanta-Manlapaz, the “dominant world-view projected by the imagery in Cowper’s hymns is that of life-as-warfare” with images of a struggle between God and Satan’s attempts at his throne (134). This is precisely the scene that arises in “Enchantment Dissolved.” However, this struggle is also a general theme of Evangelicalism and does not necessarily distinguish Cowper from Newton as they share the same religion. Neither does the hymn exhibit the images Cowper used most frequently, such as worms, thorns, tempests, and light, but it does include another common image of his, that of slavery as in line 26: “When from our guilt and bondage freed.” But this is likewise general to Evangelical thought and hence not definitive (Hartley).

As seen above, there are many ways that “Enchantment Dissolved” resembles William Cowper’s other hymns and aligns with his style. Though the hymn was ascribed to Cowper in several editions, perhaps through a misreading of efforts to distinguish them in the first edition of Hymns, it is firmly identified as John Newton’s work through consultation with primary sources, such as his diary. Further work in localizing and dating the Swynock commonplace may help to place the hymn in a timeline that could help identify whether “Enchantment Dissolved” was copied from a source crediting Newton or Cowper for the hymn. Furthermore, we should recall that the Swynock commonplace does not cite the title or the author of the hymn and further disengages the hymn from its original context and authorship by adding verses. It may be that collecting certain authors and keeping track of authorship was not a primary concern of the users of this commonplace. Perhaps the compilers had an alternate purpose for the manuscript book, such as preparation for a discussion group or as an inspirational text for personal writing. Therefore, the idea of authorship needs to be reconsidered, not only as attribution but as creation. Considering the added verses at the end of “Enchantment Dissolved” are vitally important in understanding the presence of the hymn in the Swynock commonplace.
Questionable Continuity: Four Additional Stanzas

The four added verses in the Swynock commonplace cannot be found in a printed version of the hymn nor in Newton’s diary. We must therefore question whether those lines are of Newton or Cowper’s hand or someone else’s entirely. It is possible that the manuscript compiler decided to add their own words to the end of a favorite hymn. In fact, the act of compiling the commonplace may have prepared them for the act of creation. According to Max W. Thomas in his article “Reading and Writing the Renaissance Commonplace Book: A Question of Authorship?,” reading and writing are both a part of commonplace compilation, and “operate simultaneously . . . as constituents of the conditions of poetic textual production” (676). Commonplaces were meant to assist memory, but for many different purposes: simple storage, group activities, or preparation for a task such as collecting influences for personal writings. The influence of consecutive texts on each other and the compiler would depend on how the commonplace was used.

How the themes and style of the addition match or contrast the original hymn alludes to how the scribe intended for the two to mesh together or change the meaning of the original. On the page itself, the two sections of verse are combined physically. Even though the verses would not fit vertically on the page, the compiler chose to turn the book on its side to finish writing so it would appear together on one page. The new verses start right after the original verses end; there is no separation—not even between the horizontal and vertical sections. This continuity gives the hymn both a feeling of cohesiveness and separation because the verses are connected physically but diverge in subject matter and audience.7

Thematically, the two sections of verse fit together awkwardly because the first five stanzas end naturally. The last line of these verses feels complete with the words “And Glory at the End,” which literally signals its finality (30). This hymn appears in Newton’s diary on two consecutive pages and all of the text is written horizontally. His writing ends with the same printed words and his entries continue with a new hymn immediately following.8 The new verses announce that the listener should be grateful to God and are centered on the arrival of a new year, bringing everyone closer to

7 See Fig. 1 and 2 in Appendix.

their meeting with God. These ideas are superficially similar to those in the previous verses, but they are more realistic and deal less with extended metaphors and images, such as the traveler and the false visions created by Satan. The added verses are much more joyful with none of the dark imagery or uncertainty of the original hymn, such as imagery of slavery with “guilt & bondage” and the “wretched place” (26, 21). There is no mention of blindness or religious questioning in the addition, perhaps because it is builds on the change occurring in the original. The joyfulness may offer a reinterpretation of the hymn’s theme, providing a more uplifting ending corresponding with the writer’s own life.

For example, these four verses use the string of words “Faith & Hope & joy & peace” to describe time on earth as well as the expected ascent into heaven (46). Furthermore, the hymn no longer refers to humans in general, such as the first section that uses words such as we, and us, but rather directs its words to a certain individual, the unspecified “you.” Some details about this specific audience become clear when the writer describes the “you” as a “Mother & a Wife,” which may suggest that the occasion for writing may have included a birth (51). It is possible that the scribe added his or her own verses when a relative or friend became a mother or as a general celebration of motherhood and directed a favorite hymn towards the happy event. The author still uses “we” to describe the relationship between the audience and him/herself, which implies there is a personal connection. In addressing a particular audience, word “we” shifted from describing all of humankind to describing the relationship between two people.

If the writer of the four extra verses was not Cowper or Newton and was simply a commonplace book compiler, then she was at least educated enough to follow the rhyme and meter scheme set up in the first five verses. Not only do the four verses follow the same AABCCB rhyme scheme, but they follow the repeating 8-8-6 syllable pattern within each line as well. These patterns indicate the composer of the four stanzas was keyed-in to the music of the lines and perhaps desired to personalize a favorite hymn and give it a more positive conclusion. The ending of the new hymn verses describes the “endeared” position on earth of being “A Mother & a Wife” and the joys to come when “Jesus send[s] his chariot down” (50-52). This ending seems to be an expansion of the original ending of “Enchantment Dissolved,” which simply states that the reader will “Glory at the End.” The new verses expand that idea and concretely state what wonderful things will happen at the End. This addition perhaps speaks to the creator’s need to see his or her religion work through their lives or the lives of their loved ones and the desire to find
specific examples of heaven to cling to. Rather than using lofty or flowery language to describe their religious views, the writer of the new verses uses more personal and domestic images, such as calling heaven “home,” and ideas about relationships to build meaning (42). These lines revise the previous verses about enchantment and translate them into the domestic realm of motherhood and a life spent awaiting heaven. If these more personal images and language correspond with other themes and events in the commonplace, it may help draw conclusions about the purpose of the text and determine the author of the additional verses.

The Commonplace

The presence of the additional verses attached to “Enchantment Dissolved” raises the question of other additions in the commonplace and whether there are connections between the addition and the entries that surround it. The Hannah Swynock commonplace lacks a consistent organization, such as headings for each entry or an index for finding the texts. Some of the handwritten entries are headed with what seems to be a title centered at the top of the page, while other entries start at the top of the page without any heading to distinguish them from surrounding text. There are multiple hands contributing different entries and sometimes large sections of text are written in the same hand, while at other times multiple hands are used intermittently. The section of twenty six pages at the back of the book is written upside down from the rest of the manuscript and likewise does not exhibit regular organization or headings. However, most of the texts appear to be written in a similar hand, indicating that one person may have collected and entered them into the commonplace.

The scribe chose an unassuming and rarely-mentioned hymn, “Enchantment Dissolved,” to supplement with an addition, creating a unique composite of published and personal writing and general and domestic images. They are not marked by any identifying information, which indicates the scribe was not particularly concerned with recording authorship or dividing the original hymn from the addition. Since there is so little concern shown for recording this kind of information it may be theorized that the scribe(s) was familiar enough with the texts not to need markings or she was hand writing texts for a future use that did not concern authorship or titling. Commonplaces are memory-stores for excerpts of reading, related information, and personal writing; the Hannah Swynock commonplace is full of Sir Matthew Hale’s writing as well as many hymns and poems from
various sources. These entries are indicative of the scribe(s) reading content because they were chosen for saving in a personal record, but there is little context to determine the purpose for that record or collection. Fred Shurink’s article on manuscript commonplace books in early modern England describes the different purposes and uses for commonplace books, which includes both “pragmatic” and “recreational” reading (453). People used commonplaces for many different purposes but they all involve the collection of readings and possible references back to them to “prepare for action in the private sphere” or simply to remember what the scribe had already read (Shurink 455).

The section of twenty six pages at the back of the Swynock commonplace has particularly cohesive themes and subjects, as if the entries are connected in some way. For example, there are many references to a new year, a birth, and the loss of a friend, all of which seem to connect with the added verses of “Enchantment Dissolved.” One particular instance of these motifs is a poem headed “The New Year” in which the poet describes the idea that he will live to see more years as “blind presumptuous thought,” and attributes to the passing year as having “laid up stores of Grief.” The poem then announces the resolution of the speaker to change their ways in order to reach heaven, using the words, “let me now indeed begin to live” that appear to mimic “Enchantment Dissolved.” Line 25 of Newton’s hymn, “then we begin to live indeed,” is extremely similar, differing only in pronouns (“me” versus “we”) and word order. This text, which is currently unidentified in any printed source, plays on the same themes of religious blindness and resolving to achieve heaven, but also talks about the arrival of a new year, which is a main subject of the additional four verses of “Enchantment Dissolved.”

Looking at these two texts suggests that the scribe may be paying attention to particular themes and ideas of mortality and religious merit.

A poem with similar themes in this back-section of entries also matches the style of the original five verses of “Enchantment Dissolved” because it is dreary and somewhat fatalistic.

“While we run on, deceived and blind
Death stalks in awful pomp behind”

These lines evoke the same emotions as Satan blinding the speaker in “Enchantment Dissolved” and cheating him out of heaven. However, this text states the idea more explicitly using “Death” instead of Satan and personifies

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9 Image 007v_0185
10 Image 006v_0184
it using the verb “stalks.” Throughout many texts in this section, there is a sense that death is just around the corner but that the speaker or writer of the poems is not prepared for that eventuality. Many entries discuss repenting and resolving to change paths in order to attain heaven. These texts seem to admit to the hardships of life and the real struggles of faith that the scribe(s), like Cowper, may have experienced.\footnote{Further research would help determine if these are common images and themes in Evangelical writing or doctrine.}

A unique characteristic of this section is that its entries seem to feature gender more frequently than the rest of the commonplace. There are many mentions of female figures or addresses to females that may suggest the scribe(s) possibly were female, addressing a female audience, or using female characters to make a point. One poem directs its voice toward a female audience in the second stanza: “But you, dear Maid, may well rejoice / For you have heard the Saviors voice” and tells the ‘Maid’ that she is destined for heaven and “each returning year that flies / Lessens your distance from the skies.”\footnote{Image 163_0163} This entry, again, deals with a new year and coming closer to heaven, but also a female audience member like the additional verses of “Enchantment Dissolved.” This example is similarly more cheerful and focuses on the joys of heaven rather than the sins of humans. The ‘Maid’ in this entry is held up as an example of the kind of person who is destined to attain heaven and the speaker in the poem addresses Christ to shine upon her in the last stanza.\footnote{Image 015v_0193} It is uncertain whether the maid herself is the audience or if it is meant for a general audience to learn from the example of the maid.

Entries in the commonplace relate to gender in idiosyncratic ways. One of the more exceptional examples is also one of the rare entries where the scribe turned the book on its side and wrote vertically. Text written vertically may indicate that the entry was added a later time or squeezed into empty space. This text appears unrelated to the first text on the page, which an
acrostic describing Dr. Isaac Watts as a young poet. The addition is addressed “To Mr. B.” Interestingly, the text that follows seems to be addressed to a woman.

“When my red-letter’d days appear
My thoughts to living saints are led,
Will you dear Madam now receive
What love indites devoid of Art?
The faint my verse as you perceive
Strong is the language of my heart.”

This poem appears to be one meant for a female audience, but is addressed to a Mr. B in the commonplace. The speaker in these lines wants to assure the female audience that she is much beloved and there are hints that the speaker may be close to death or is thinking about someone who has passed. This gendered address is unique because it is a poem addressed to a possibly fictional woman further addressed to a possibly real man. Perhaps these lines are meant to comfort the Mr. B who finds himself in a similar situation but his relationship to the commonplace or its scribe(s) is uncertain.

Another entry announces the wonders of “Friendship! thou powerful sovereign of the Mind” and the speaker looks forward to the “distant hour / of Heav’n indulgent hear my ardent pray’r.” The speaker in this entry is likely addressing a female because two lines state, “There my Fidelia . . . / Our souls shall meet —& and ne’er be parted more.” This entry is full of grief and ardent lamenting for a lost friend, ideas possibly connected to the other entries concerning the nearness of death and other females who are addressed and discussed in the commonplace as virtuous and deserving of love on earth and in heaven. Many of these entries point toward feminine friendship, grief, and references to time. It is possible that this section of text was written in response to real life-events such as the loss of a friend through death or departure.

14 Watts was an extremely prolific and well-known hymnist by his own right, this entry indicates that the commonplace compiler(s) was aware of trends or popular religious texts. Isabel Rivers, ‘Watts, Isaac (1674–1748),’ *Oxford Dictionary of National Biography*, Oxford University Press, 2004; online edn, Oct 2008 [http://www.oxforddnb.com/view/article/28888, accessed 18 May 2016]

15 Image 164r_0164

16 Image 0167r_0167
Discerning the chronological ordering of the entries in the commonplace is important for understanding whether there could be a progression or reactionary relationship between the individual texts. Because this section of text is separated from the rest of the commonplace, it might be assumed that it was written starting with the last pages of the commonplace working toward the middle of the book. When read front to back, in the same direction as the rest of the commonplace, there appears to be a chronological ordering of the entries. When read chronologically, one text, “Christmas Day XVI,” although not titled as such in the commonplace, is a poem by Sir Matthew Hale\(^\text{17}\) and is written in this section eleven pages earlier than a personal record headed “money expended since Xmas.”\(^\text{18}\) Reading the manuscript in this fashion places the Christmas poem before the poem titled “The New Year,” suggesting some type of chronology is at play.

Depending upon the chronological structure of the entries, "Enchantment Dissolved" can be interpreted as the culmination of earlier entries or as a touchstone for later entries that concern similar themes. Chronology is important because “Enchantment Dissolved” and its addition comes toward the beginning of the section, if read from front to back, and towards the end, if read from back to front. The direction of reading matters because it indicates whether the scribe of the new verses was influenced by the previous texts or not. If the hymn comes at the end of the section, it may be seen as a culminating work that is derived from the act of reading and collecting other texts. It may be possible to find allusions to the other texts or to thematic ideas in both “Enchantment Dissolved” and the surrounding texts, such as the allusions to a new year, blindness, death, and friendship. However, trying to make connections between texts in a commonplace can involve dangerous amounts of assumptions and planting of meaning in a text that may only function marginally in the scribe’s life. Given that the entries are connected by their location in a single commonplace and in proximity to each other within the manuscript, it is acceptable to theorize about what

\(^{17}\) 165r_0165 is the only image in the commonplace where Sir Matthew Hale’s name is written out by a scribe. This seems significant because his writing features heavily in the front section of the book without any attribution. The text, ‘Christmas Day XVI’ was identified in the following resource using lines of text from the transcription as the page is not headed. Hale, Matthew. "Christmas Day XVI." Contemplations Moral and Divine in Two Parts. London: William Shrowsbury, 1699. 287-88. Google Books. Web. 16 May 2016.

\(^{18}\) Image 003v_0181
those texts meant to the scribe(s), why they were written down, and how they might have been used.

Further research on the Swynock commonplace may identify other altered entries that could indicate whether the commonplace was used as a storehouse for texts that correspond to life events, a record of religious development, or a community collection of verse and prose. This information would help locate the commonplace’s origins because printed source-material for entries may point to specific regions or time frames. To date, the identities of the scribe(s) remain unknown. However, the section at the back of the commonplace and the addition to “Enchantment Dissolved” feel specific because they concentrate on themes of personal grief and gendered characters. Clues such as gendered addresses may help pinpoint an expected audience. A tragedy, such as the loss of a friend, may have prompted the scribe to write additional verses, extending the ending of a favorite hymn to encompass their own experiences, but it is difficult to draw conclusions from such a broad social and religious context. The scribe(s) of this section of the commonplace appear to be responding to their personal lives using the prescribed religious and Evangelical texts of their time. Not only do they appropriate pieces of text from their cultural surroundings for collection, as is the function of a commonplace, but they also commune with those texts through personal additions that may be the best access-point to the individual reader and writer of the 18th century.

Appendix A

Enchantment Dissolved Transcription
MS. Hannah Swynock 1687

1. 1 Blinded in youth by Satans Arts
2. The World to our inpractis’d hearts
3. A flatt’ring prospect shews;
4. Our fancy forms a thousand schemes
5. Of gay delights & golden Dreams
6. And undisturb’d repose.
So in the Desarts dreary waste
By Magic pow’r produc’d in haste
As old Romances say,
Castles & Groves & music sweet
The senses of the Traveller cheat
And stop him in his Way.

But while he gazes with surprise
The charm dissolves, the Uision dies
Twas but enchanted Ground:
Thus if the Lord our Spirits touch
The World which promis’d us so much
A Wilderness is found.

At first we start and feel distrest
Convinc’d we never can have rest
In such a wretched place;
But he whose mercy broke the charm
Reveals his own Almighty Arm
And bids us seek his face.

Then we begin to live indeed!
When from our guilt & bondage freed
By this beloved Friend
We follow him from day to day
Assur’d of Grace thro all the Way
And Glory at the End.

What thanks are to the Saviour due
From me, dear Madam, & from you
33. That we were undeceiv’d!
34. His Voice with each returning year
35. Tells us Salvation is more near
36. Than when we first believ’d

37. 7 By love & pow’r encompass’d round
38. Each year with signal mercies crown’d
39. Thus for our Souls are come!
40. And he who helps us hitherto
41. Has promis’d to support us thro
42. Till we arrive at home.

43. 8 May the new year you now begin
44. (As many former years have been)
45. A year of blessing prove:
46. May Faith & Hope & joy & peace
47. The Saviors blood bought Gifts increase
48. In you & all you love

49. 9 May you the comforts long possess
50. which those endeared names express
51. A Mother & a Wife!
52. Till Jesus send his Chariot down
53. And call you to receive the Crown
54. Of everlasting Life
Appendix B

Manuscript Image: 014v_0192
MS. Hannah Swynock
Works Cited


"Blinded in Youth by Satan's Arts." Hymnary.org.


Swynock, Hannah. 1687. MS, Parker MSS. Indiana University Rare Book Library.


**Works Referenced**


UNCOVERING THE MYSTERY OF MACHU PICCHU

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Abstract

If mysteries were ranked, Machu Picchu would be on the top of the list. This Incan site, destination for millions of tourists, archaeologists and researchers each year, is one of the biggest enigmas of Incan culture. Its mesmerizing view has prompted hundreds of unanswered questions about this civilization. Incan culture revolved around cities, built without reference to the world beyond. Although the Incas were incredible architects and inventors, they lack written records, shrouding their culture in mystery for many years. While research has illuminated some facets of Incan culture, a significant question still remains: what purpose did Machu Picchu play in Incan society? Over the years, many researchers in different fields have attempted to answer this questions. This article will analyze these findings and argue that a key purpose of Machu Picchu’s design was to exploit its geographical advantages.

Machu Picchu Compared to Other Incan Cities

Incan civilization developed in Peru between c.1400 and 1533 CE and extended throughout South America from modern-day Quito, Ecuador in the north to Santiago, Chile in the south. This empire was the largest ever seen in the Americas and, at the time, the largest in the world. Due to the harsh, unpredictable environment in the Andes, the Incas managed to conquer people and amass territory in diverse areas, including mountains, deserts and jungles. Noted for their architectural style, they designed and established signature buildings wherever they conquered. Their finely-built structures, adapted to distinct natural landscapes like mountaintop settlements, continue to impress modern visitors.

During their brief reign, the Incas created massive cities as a testament to their incredible engineering skills. They arguably had the best-planned cities in the ancient Americas, using consistent features in each. One of the main characteristics of every Incan city was that a central plaza surrounded
by temples and public buildings. The center of each city consisted of temples, a palace for the visiting king, and houses for nobles and priests. Houses for common people were spread around the central area. Fortresses were built near each city for people to gather in times of danger.

The most famous Incan cities include a number of features with purposes figured out by archaeologists. Sacsahuaman, “arguably the greatest Inca ruin outside of Machu Picchu” (Adams 2011) overlooking Cuzco, the capital, is believed to have once been a royal fortress and retreat because of the zigzag walls built with enormous rocks. When Hiram Bingham went to Peru in 1911 to search for the Lost City, one of his priorities was to find Victor Rumi, an important Incan settlement. This site was built for religious purposes, featuring the “White Rock’ in Quechua—an intricately carved granite boulder the size of a city bus, which was once one of the holiest shrines in the Inca Empire” (Adams 2011). Pisac, another Incan settlement less than an hour away from Cuzco, is noted for its “curving agricultural terraces” (Adams 2011) and its carved rocks used for astronomical observations.

Cuzco, the capital, served purposes both political and religious. This holy city was home to the residences of its rulers and were bustling with activity. With its peculiar staircase design and twenty degree temperature variation between top and bottom, researchers believe the city “Moray was an Inca agricultural site where experiments on crops were conducted” (Adams 2011). The Isla del Sol, an island in the middle of Lake Titicaca, is, according to the Incan creation myth “where the waters that once covered the Earth receded and the all-powerful sun god, Inti, first emerged” (Adams 2011).

Unlike these other cities and the typical structures used by the Inca when building new places, Machu Picchu has no clear role. There is no main building overshadowing other structures. Machu Picchu is so mysterious because it not only encompasses a mixture of characteristics present in other Incan cities and offers several unique features not found elsewhere.

**Literature Review: Previous Research on the Role of Machu Picchu**

One of the existing theories attempting to explain the role of Machu Picchu in Incan society is that this site was built for astronomical purposes. Observatories were essential to the Incas because they needed them to plan their agricultural activities and govern ceremonial occasions. University of Arizona scholars Dearborn and White studied the Torreon, a building in
Machu Picchu, assuming that the building guided the life of the Inca who lived there. According to the authors, the Torreon was “designed as a precise instrument for fixing the date of the winter solstice as well as designing a period about the zenith passage date and for observing certain constellations” and was built with such preciseness and carefulness which justify why everything in Machu Picchu should have revolved around this exact building (Dearborn and White 1983, 37). The Incas used the Torreon as an observatory to see the solstice and predict its occurrence with good accuracy similar to how they used a building akin in Pisa, another Inca settlement (Ziegler and Malville 1996). The research agrees that Torreon was a precise instrument for astronomical observations.

Machu Picchu’s location undoubtedly provided an unobstructed view of astronomical phenomena, explaining the importance of the Torreon. However, out of the more than 150 buildings located in this site, only the Torreon, the Intihuatana stone, and the Room of the Three Windows are the built to observe celestial events. This means that less than 2% of the buildings in Machu Picchu were built for astronomical purposes. On the strength of this number, it can be assumed that although astronomical observation was culturally important and possible at the site, Machu Picchu was not built with this primary focus.

Another theory suggests that Machu Piccu was built as a royal estate for the Incan king Pachacuti. Yale University researchers Richard Burger and Lucy Salazar suggest that Machu Picchu was built in a seemingly inconceivable location requiring extensive labor to serve as a symbol of the king’s divine power, authority, and legitimacy (Burger and Salazar 2004, 25). Another researcher argued it was built to commemorate Pachacuti’s conquests and to support his family lineage (MacQuarrie 2014).

While this theory is appealing, it has several flaws. According to Guillermo Cock, a Lima-based archaeologist and research associate at UCLA, "the members of Pachacuti’s panaca may have lived there during the year for a few days, weeks, or months,” but there is no evidence that Machu Picchu was primarily built for the royal family to spend a few nights there (Cock 1986, 115). Furthermore, the royal estates theory was first proposed in the 1980s and was “largely based on a 16th-century Spanish document that referred to a royal estate called Picchu, which was built in the same general area as Machu Picchu” but was smaller and less significant (Cock 1986, 121). At the time of its development, this theory held more weight because the extent of Pachacuti’s royal estates were not fully understood. In context with the other royal estates, Machu Picchu does not fit.
Due to the terraces in the site, it has been theorized that Machu Picchu may have been built for agriculture. This theory suggests Machu Picchu existed as a self-contained city intended to produce its own food and export food (mostly maize) to other cities. Archaeologist Ann Kendall explains that the terraces were extremely efficient at conserving scarce rainwater and the site was perfectly suited for agriculture (Kendall 2011).

Despite this evidence for an agricultural purpose, there may still be other factors at work. According to Brian Bauer, an expert in Andean civilization at the University of Illinois at Chicago: “Machu Picchu—which was built around A.D. 1450—was, in fact, relatively small by Inca standards and maintained only about 500 to 750 people” (Bauer 2015, 68). Machu Picchu’s residents almost certainly made use of the terraces surrounding it for farming, but “these terraces alone couldn't have sustained the estimated population of the day and that farming most likely also took place in the surrounding hills” (Bauer 2015, 68).

Hiram Bingham, the discoverer of Machu Picchu, believed after first discovering the site that the Inca Virgins of the Sun fled from Cuzco to Machu Picchu in an attempt to escape Spanish conquerers. According to Incan tradition and culture, exceptionally beautiful virgins were chosen to become priests and serve the gods. They were part of a holy order of Chosen Women dedicated to the Inca God of the Sun, Inti. Bingham believed that Machu Picchu sheltered a large number of these women since several female skeletons were found by Bingham’s team buried inside different caves in Machu Picchu. Hiram Bingham concluded that “the Chosen Women whose lives from early girlhood had been devoted to all the duties of the Sanctuary found a refuge from the animosity and lust of the conquistadors” at Machu Picchu (Bingham 1952, 266).

While the theory of Machu Picchu as home of the Chosen Women persisted for decades, there is recent research suggesting it may not be accurate. In 2003, Yale researcher J.W. Verano discovered the female skeletons discovered by Bingham’s were actually half male and half female. According to Verano, at the time of the discovery, science hadn’t arrived at an understanding of skeletal differences between genders. Without this knowledge, the Bingham team couldn’t know that Andean skeletons were generally shorter and less robust than African and European skeletons. Small bones did not necessarily indicate female skeletons. Verano discovered that some of the skeletons belonged to children and helpers from all over the empire. (Turner et al. 2010)
While a number of theories have been proposed over the years, they are still open for question as research continues and new theories are developed.

**Geography as Leading Cause**

After a literature review and analyzing previous theories regarding the Machu Picchu site, the notion that Machu Picchu was built to take advantage of the geographical region encompasses most theories and established knowledge about how the Inca operated.

Religion was, for the Incas, as with various other ancient cultures, attached to history, politics, and the functioning of their society. From government to marriage to burials, religion was attached to all stages of community life. Success and failure were determined by the Incan gods and ancestors. It was very important to their religious practices to keep their gods happy to prevent natural disasters such as earthquakes and droughts. With religion at the center of Incan life, it makes sense that Machu Picchu would be built on what the Inca considered holy landscape.

Machu Picchu is surrounded by the Urubamba River located 2000 feet below the citadel. This river curves around the mountain in which Machu Picchu is located and some of the agricultural terraces extend all the way down to the river. The river cannot be navigated at the location of Machu Picchu, but further down it is possible to use boats to navigate to the Amazon River and all the way to the Atlantic Ocean. This may have been purposeful to avoid having people navigate directly to Machu Picchu but still offer a relatively close route of transportation. The Urubamba River is oftentimes called the Vilcanota River, which translates to “sacred river.” This river was considered sacred to the Inca partly because nature was sacred to them but also because of the advantages it brought (Clark 2011). Certainly the river was a consideration when analyzing the geography of the area.

Mountains also represented a holy symbol for the Inca. The snow-capped mountains seen from Machu Picchu were particularly holy as reliable sources of water. This location was rich in huacas, naturally sacred objects revered by the Inca. In this case, the top of the mountain represented a huaca and if Machu Picchu was built there, it would represent a huaca too (Clark 2011). The Inca related huacas to agricultural production and religious rituals.

According to the archaeologist, professor, and senior research fellow Johan Reinhard, Machu Picchu surely would have been seen as a prominent sacred center. He points out its religious significance is directly linked with
its geographical location. The Incas believed that the sun was their divine ancestor. Reinhard mentions that “the rising and setting of the sun, when viewed from specific locations within Machu Picchu, aligns neatly with religiously significant mountains during the solstices and equinoxes” (Reinhard 2007, 131). The Sun, the almighty god, was the propeller of life. It brought the light that plants need to create oxygen and without “him” the day did not exist. Most importantly, the sun was associated with being made of gold, so every artifact made of gold came from the god of the Sun. Reinhard suggests that Machu Picchu fits into a sacred geographical setting, pointing out that Machu Picchu’s location is “an example of cosmology intertwining with sacred landscape that is virtually unique in the Andes ... [and] that takes on a degree of sacrality because it combines the Earth and the sky, which are also combined in Incan thought.” (Reinhard 2007, 125).

The theory of Richard Burger, Lucy Salazar and Kim MacQuarrie about Machu Picchu serving as a royal estate may contain some truth. Since the Inca placed such value on religion, the Incan king Pachacuti could have decided to employ these geographical religious advantages in building Machu Picchu in this location. Once the citadel was built, the people living in it would be able to take advantage of these religious aspects. In this variation of the theory, Machu Picchu would have not been built with the main purpose of being a royal estate, but rather to use its geographical religious advantages to enhance a royal estate.

Machu Picchu’s altitude is also extremely important, synonymous with its proximity to the sun. When the Sun is a god, being up close to the sun facilitates a closer relationship with the Sun and the god. The Inca also believed a closer position to the Sun would facilitate the better practice of astronomical studies. The Inca needed astronomy to predict the changes of the seasons and to effectively organize their agricultural patterns, so building a settlement at this location would allow them to exploit this specific geographical feature.

Other geographical features made this site particularly attractive for the Inca. For instance, the mountains would allow them to build terraces in the southeastern part of the citadel in different shapes and sizes for crop growing and controlling rain-produced erosion (Wright and Zegarra 2001). Agriculture would not have been a main purpose because the terraces were not sufficient to cover the population’s needs, but rather were created to take maximum advantage of the location’s offerings.
Proximity to the rainforest was certainly another advantage of the geography of Machu Picchu. According to Benjamin Craig, “the rainforest was the only source of rare products that were prized by the Incas such as colorful bird feathers, butterflies, coca leaves, exotic fruits and vegetables and healing herbs among other products” (Craig 1999). The Inca would exchange these products with tribes from the rainforest for things that they did not have such as potatoes, guinea pigs, precious stones, quinoa, and gold and use them for religious ceremonies. When building Machu Picchu, the Inca must have considered the benefits from being so close to the rainforest as a trading source.

Its location once again presented an advantage because it was so remote and hard to access for people who did not know the route. Anything built on the site would be protected by nature and if the citadel was under attack, invaders would have a hard time getting there, providing a tremendous defensive advantage. There are no records that any battle ever took place here. The surrounding mountains served as a protection for whoever lived here, be it royal families, priests, and, in fact, any Incan commoner.

The theory presented in this paper suggests that the Inca decided to build in this area to take advantage of the comprehensive geography of the place. Later on, as other theories suggested, Machu Picchu may have had additional purposes such as supporting an astronomical research base, conducting religious ceremonies, growing crops, hosting the king when he visited, and providing a home for priests and Chosen Women, all distinctive facets of Incan culture. Ultimately, the Inca must have built Machu Picchu where it is to get the most out of what the geography of the place gave them.

Conclusion

For centuries, Machu Picchu was unknown to the outside world. Though the locals of this region knew of its existence, it remained untouched by researchers and archaeologists for years. When discovered, however, many questions arose, specifically: what was the purpose of building such a monumental site?

The aim of this paper was to propose a new theory that solved the problem of previous theories by incorporating the best aspects of them and leaving the most problematic aspects behind. This theory explains how Machu Picchu was built to maximize and take advantage of its comprehensive geographical location.
References


SOCIAL RELEVANCE AND INNOVATION IN PUBLIC RADIO

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Abstract

Since its founding, National Public Radio has been denied steady funding by the government and has therefore been focused and reliant on its audience for funding. This study explores National Public Radio's (NPR) efforts to appeal to audiences by staying relevant and innovative in the face of changing technology and new media. The study content analyzes five years of news media coverage of NPR stations for news values and key messages. Out of 1,853 articles that were analyzed, about 23 percent were related to the stations’ efforts to remain socially relevant and innovative. Those articles were then examined using descriptive analysis to identify prevalent themes within social relevance and innovation. Six themes emerged from the descriptive analysis. These themes are related to innovation (strategizing, investments and future journalism, and online strategies) and social relevance (audience and diversity, activism, and social media). These six themes were then interrelated to reveal a linear relationship of a social relevance and innovation movement based on NPR's methods and stages of change, from formulating strategies to actively participating in the community. Results indicate an audience-centered priority and a continued commitment to act in the public interest. Potential implications of the results and directions for future research are discussed.

Introduction

The news media, from newspapers to television, is ubiquitous. Though differing in style and form, the news media industry is generally united by an overarching mission to spread and disseminate information, epitomize free speech, and strengthen the public sphere. However, media is constantly changing. With the arrival of the digital age and freer access to content, new media enables the news media to articulate diverse, disparate views to a geographically dispersed population. Digitization has made the world increasingly interconnected and the modern age of journalism includes the
common citizen as a storyteller. An Iranian doctor told a story using his cell phone, recording a video of a woman named Neda Agha-Soltan being murdered on the streets of Tehran (Shattuck, 2010). The changing nature of media also enhances the ability of people to undertake collective action — exemplified by the Arab Spring and marches in Ferguson and Baltimore, kindled by the Twitter hashtag #BlackLivesMatter. Journalism and storytelling play an important role in the United States, acting like a “mirror” to society with the potential to influence its audience.

Since the radio boom after World War I, public radio has played an important role in society. The medium was regarded as one of the most reliable, quick, and efficient sources of news (Waldman, 2011). Radio waves reached Americans in their homes and in their cars across the country. Within a matter of minutes, the radio delivered emergency alerts, presidential speeches and special news events, such as the Scopes “Monkey Trial” (Waldman, 2011). In the early 2000s, hours of local news programming rose, and in 2010, public radio stations deployed more than 1,400 staff members to 21 domestic and 17 foreign bureaus — more than any broadcast television network. Public radio has demonstrated an unprecedented commitment to reporting local and regional stories, filling a gap left by the commercial sector. Though popular, it is also criticized, as some argue public radio has focused narrowly on serving affluent, well-educated, and white communities — all groups reportedly underserved in the commercial sector. Yet others argue public radio has done more for its audience than television or commercial radio (Waldman, 2011).

National Public Radio (NPR) was founded with the mission to provide a non-commercial source of culture and information to the public while promoting personal growth, respecting differences, and celebrating experiences (Mitchell, 2005). Through the nature of its mission and guidelines, NPR is held to higher standards (McCauley, 2005; Mitchell, 2005). To date, there are over 900 NPR stations across the United States with two-thirds of the stations licensed to or affiliated with colleges or universities (NPR, 2017).

As changes in the media landscape upended traditional news industry business models, the industry endured substantial job losses, primarily in the newspaper sector. The ramifications of the competitive pressures that followed created gaps in coverage and less accountability in local reporting. Radio stations were affected as well.
As former CBS President Mel Karmazin explained, the subsequent commoditization and homogenization of content was felt at his company and many other large companies that “abandoned what had made these radio stations enormously successful” (Waldman, 2011, p. 62). That missing element, Karmazin said, was producing local content (Kennard, 2010). Research conducted by Usher (2012) reveals NPR as one organization that trended toward homogenization of content. In fact, NPR shifted in the 1990s away from localized content, a move that is “difficult” and “expensive” to rebuild, according to Richard Towne, formerly general manager of NPR affiliate KUNM (Dorroh, 2008).

This paper examines how NPR stations have been covered in the news media to understand how public radio stations have stayed relevant and innovative as they face the challenges presented by the changing media landscape. This paper first looks at the history of NPR before delving into an analysis of relevant news media coverage of NPR stations, followed by an analysis of news articles related to social relevance and innovation. The themes identified based on this descriptive analysis will be presented and the paper will conclude by discussing the results and limitations of the study, as well as suggesting directions for future research.

**Literature Review**

**HISTORY OF NPR**

A group formed by Lyndon Johnson to define the public broadcasting system called The Carnegie Commission on Educational Television delivered the groundwork for the Public Broadcasting Act in 1965. This act led to the creation of a nonprofit, noncommercial, and independent enterprise to provide news and educational programming (Avery, 2007). Its aim was to aid the “public interest” – a factor notably absent in commercial broadcasting. The Carnegie Commission wrote: “The goal we seek is an instrument for the free communication of ideas in a free society” (Chapman & Ciment, 2015, p. 256).

The commission believed the industry should serve as a voice that would “arouse our dreams,” “satisfy our hunger for beauty,” and become “our Lyceum, our Chataqua, our Minsky’s and our Camelot” (Carnegie Commission on Educational Television, 1967, p. 4). NPR proved the vision of the commission possible — with stories spanning from its radio adaptation of Star Wars to its award-winning coverage of the Persian Gulf Wars and
revolutionary political reporting by Cokie Roberts, Linda Wertheimer, and Nina Totenberg.

NPR accomplished these feats despite the state of the American public radio system, which, unlike its European counterparts, lacked guidelines and a unified sense of purpose. It has developed its process through trial and error, relying on audience research to help determine how many people were listening, who was listening, and why they chose to listen. This helped public radio “fuse its programs more snugly to the values, beliefs, and attitudes of the people who tuned in (and pledged their financial support) most often” (McCauley, 2005, p. 6).

The mid-1900s brought with it an era of unprecedented inflation and unemployment, leaving many Americans feeling lost and without direction. Yet at this time, America’s public radio audience experienced a remarkable growth. McCauley (2005) describes the individuals who drove this growth, mostly students and professors at universities, as closely resembling ABC’s thirtysomething cast members who longed for the sense of idealism, community, and innocence they felt in the days of their youth. American public radio soared as its leaders realized this highly educated, socially conscious and politically active audience was attracted to their brand of broadcasting.

McCauley (2002) notes, “Success has not come easily, though, because the promise of a steady supply of funds from the U.S. government — free from the taint of government influence — was never fulfilled” (p. 65). Without public funding, public radio was forced to look to the private sector. Political and financial pressures pushed NPR into niche marketing or “narrowcasting” — explaining how NPR maintained its audience over the years. In the 1970s and 1980s, NPR’s audience consisted of highly educated and well-off individuals who had been previously underserved by commercial stations (Giovannoni, 1995; Kigin, 1998).

Public radio is a key player in the United States public service sector. It serves the public interest by offering under-produced content in commercial media, such as educational programming and local news (Waldman, 2011). Sabir (2013) argues that Public Service Broadcasting (PSB) began with the radio and remains the cheapest and easiest way to carry information. PSB was first defined by John Reith, the first director general of the BBC, as an institution of education, information, and entertainment (p. 228). Most importantly, he notes that PSB aids democracy by giving value to citizens who wish to engage in policy-making processes and political discussions.
Public radio continues to be vibrant and relevant in the lives of many Americans. Yet, public radio today is not the same as it was years ago. A shift from traditional spatial emphasis based on cities, counties, and regions has evolved to a social conception of community characterized by shared interests, tastes, and values (Stavitsky, 1994). This move to globalization could be accounted for by an increase in competition with commercial media. To survive, both must cater to local and global needs (Mckinsey & Company, 1999). Despite increasing commercialization in media, public broadcasting demonstrates a commitment to social worth and is “the last best hope for socially purposeful media acting in the public interest” (Raboy, 2003, p. 46).

Lessig (1999) says new media provide unprecedented opportunities for freedom and information, but warns that freedom from state control will be replaced by a more sinister style of corporate control. Unlike state control, corporate control is structural, intended to “maximize the possibilities for efficient profit-taking rather than effective uses” (p. 76). New media also poses the challenge of coming up with an effective, marketable strategy for the changing media landscape, which Meikle and Redden (2010) note is one of new media’s pitfalls – outlets often make no notable plans regarding how they plan to adapt to the digital environment. Within this complication lies another: digital information is mobile and easily manipulated. In a democracy, it is journalism’s role to prevent such misinformation and manipulation, and to lead citizens to make informed judgments (Lazaroiu, 2012).

New media, with its ability to supersede the linearity of the journalistic process and passivity of the audience, has served as a tool for political movements around the world. Unconfined by its medium, NPR has been reinventing itself “as a multiplatform force,” Dorroh (2008) writes (p. 25). Notably, she documents how NPR has worked toward showing an audience a story rather than simply telling it. The organization has focused on making its website easily accessible across multiple screens, providing simplicity in the aesthetics, refraining from text-heavy formats for easy viewing on smartphones, and including features that extend beyond news to incorporate music and visual components. In the summer of 2008, NPR launched a set of programming tools to allow viewers to interact and share their content easily. These tools, known an application program interface (API), were used to create widgets, including a podcast player and an interactive world map linking the stories of NPR’s affiliate stations. Through the John S. and James L. Knight Foundation, NPR was given $1.5 million to train hundreds of editorial staff to develop and hone their digital storytelling skills (Dorroh,
Maggee’s (2013) content analysis study on *All Things Considered* found NPR’s “style and sourcing” changed to suggest technological and online developments.

**INNOVATION AND SOCIAL RELEVANCE**

In past decades, overall radio listening has declined in America, with the largest gap attributed to listeners who possess advanced degrees. However, this regression is attributed to less commercial radio use while public radio is growing stronger than ever (Bailey, 2000). The importance of public radio is rising to higher levels among highly educated listeners, partly because of its ability to evolve and remain relevant and engaging.

To keep up with audience engagement and the increase in communication channels, public radio stations are looking at strategic changes within their organizations to redefine structures and cultures (Evans, 2015). In the last decade, NPR, which boasts about 32 million listeners in the U.S. on a weekly basis, went through a drastic change in its structure — an ambitious 400-person retraining plan to develop a digital strategy (Usher, 2012, p. 74). This restructuring effort was in response to the previously-mentioned grant NPR received from the Knight Foundation in 2008 to expand into digital news (Fest, 2007). At first, journalists were resistant to learn digital skills, but when NPR executives didn’t place a “top-down approach” or a “significant quantifiable production requirement”, journalists, free to do things their own way, developed web exposure. Conflicts did not emerge between web and radio (Fest, p. 76). Through a series of interviews with NPR’s executives, Usher (2012) learned that this change, which led to conditions of ambiguity, guided NPR to innovation. This effort, he says, has helped NPR secure a sound future (p. 66).

Usher (2012) reveals how NPR’s structure changed from a managerialist approach to something more “inclusive of diverse perspectives” (p. 68). To evolve this way and to overcome resistance to change, journalists need to feel that online work will become a part of their professional identity (Robinson, 2009). NPR’s strategy revolves around the thesis that it is “disrespectful of the modern news consumer to insist that your news is available in only one form in only one platform” and its vision indicated a flattening of hierarchies (Usher, 2012, p. 72). NPR’s ability to be innovative has been recognized across the United States (Bond, 2011; Doctor, 2011). While NPR programs are just radio shows, they are also the “tip of the iceberg of innovations in a soundwork industry” (Hilmes, 2013, p. 181).
This study draws on news media coverage relating to social relevance and innovation in NPR stations to help illuminate the role of NPR stations and examine the efforts of NPR stations have made in keeping up with the changing media landscape. More specifically, it seeks to explore NPR’s coverage in the news media. Therefore, the following research question is proposed: How do news media portray NPR stations’ work to innovate and stay relevant to their audiences?

**Methods**

This study used descriptive analysis to examine news media articles relevant to NPR stations’ social relevance — if a reference for example were made about audience participation or tools for an interactive map — and innovation-related messages — which can range from online journalistic ventures to new mobile apps and internet channels. Based on the analysis, this study identifies prevalent themes, explores relationships among them and draws conclusions about NPR’s efforts to innovate and stay socially relevant.

**INNOVATION AND SOCIAL RELEVANCE**

Twelve NPR member stations were included in this study. They include American Public Media/Minnesota Public Radio (MPR), the flagship National Public Radio member station for Los Angeles and Southern California (KCRW), San Diego Public Radio (KPBS), KPCC (Southern California Public Radio), Public Media for Northern California (KQED), Houston Public Media (KUHF), North Country Public Radio (NCPR), Oregon Public Broadcasting (OPB), Chicago Public Media (WBEZ), Boston’s NPR news station (WBUR), Miami, Fort Lauderdale and South Florida’s NPR news station (WLRN), and New York Public Radio (WNYC).

These stations were selected based on Evan’s (2015) research on public radio and organizational change, as they were widely viewed by radio professionals and experts as “innovative.” Such stations, representing various regions of the country, have made noticeable efforts in adapting to a more competitive media environment.
CONTENT

U.S. newspapers included in this study were limited to publication dates from January 1, 2010 to December 31, 2014. The stations’ names were used as the search syntax in the LexisNexis database. The search resulted in 3,321 articles, which were reviewed and deleted if they did not contain content relevant to the station. Other deleted articles included wedding announcements, obituaries, classifieds, duplicate articles, story indices, and online directories. After an initial round of sorting and sieving for relevant pieces, 1,853 articles remained that provided some content about one of the NPR stations selected for this study.

These articles were then examined for the presence of one of two key variables: innovation and/or social relevance. An article is considered innovation-related if it mentions any present or future changes or new directions that may discuss the development of new services (like Twitter campaigns and live video streaming) and products (including newsfeeds, Internet channels, blogs and mobile apps). An article is considered social relevance-related if it describes how a particular NPR station provided a service to the larger society. Of the 1,853 reviewed articles, 81 were specific to one of the two key variables in this study: social relevance and innovation. Subsequently, the 81 articles were analyzed qualitatively.

Statements extracted from the analyzed articles were arranged in an Excel file and grouped in categories based on common qualities and similar messages. These statements were reviewed several times. In the first review, keywords were identified with subheadings to suggest rudimentary themes. Subsequent reviews allowed for replacing makeshift categories and underdeveloped themes. This permitted an increasingly comprehensive list to develop for prevalent themes. Themes were sorted depending on what channels were involved, such as music or social media, and what forces may have driven efforts to fruition—whether the desire to create new information sources, bolster new forms of reporting, or attract an audience. The themes were then organized and separated into the broader categories of either social relevance or innovation.

Not all 81 articles were included with statements in the Excel sheet and even after themes were created, repetitive quotes and articles that were not noteworthy or relevant were removed. By the second round of coding, I was able to determine the data had reached a level of saturation. Themes were then linked to each other to establish relationships based on speculation between and among each article based on the level of action taken or about to
be taken by the station, with ideas as the most basic level and outreach being one of the latter stages.

Results

DESCRIPTIVE ANALYSIS

Six themes emerged relating to social relevance and innovation. Tables 1 and 2 summarize these themes and provide examples for each theme.

Themes dedicated to innovation shown in Table 1 include “strategizing,” “investments and future journalism,” and “online strategies.” The first theme listed—“strategizing”—includes statements about developing solutions to public radio’s challenges, whether that’s finding new ways to stay relevant, attract an audience, raise funds, or distribute and develop new programming. The “investments and future journalism” theme includes efforts to bolster and fund new forms of reporting. The “online strategies” theme describes new information sources such as newsfeeds, Internet channels, blogs, and mobile apps.

Theme 1: Strategizing. Before any efforts are made, a station must be aware that changes and new directions need to be made. For example, KQED was reportedly “looking for ideas, whether new ways to distribute and share content, raise money or allow KQED’s audience to ‘engage more deeply with the content and with others.’” KQED President John Boland said in a telephone interview that “the goal is to help KQED reinvent itself in an era where its television ratings have been steadily declining and its radio audience is flat.”

A prevalent element in this category is identifying how to overcome challenges and allow for further growth. An article about MPR written by St. Paul Pioneer Press article summarizes this as how to “engage a wide range of people” and create “new approaches to public challenges.” Some of these challenges include exploring new ways to share content and improve programming, such as through collaboration with sister stations or outside news organizations to pool resources.

Theme 2: Investments and future journalism. Collaborations with stations often led to funding ventures. For instance, KPCC received $3 million “to produce in-depth, local coverage on subjects critical to communities and the
nation.” Other funds were less specific; all that was reported was that a station had acquired funds for “a project to develop new forms of reporting.” A handful of stations were quick to identify that new directions for journalism included podcasts. In an article concerning WBEZ Chicago, Public Radio Exchange (PRX) Chief Executive Jake Shapiro declared podcasts were in demand. “All of us are feeling like we’re at the beginning of a flourishing new ecosystem around podcasts,” he said. Another new direction was a commitment to local journalism, or “community news coverage,” as one article mentioned. Methods to cultivate more instantaneous news coverage were also mentioned: WBUR hoped “to set up an area where civic journalists can cover cases by live-blogging or by cell phone.”

**Theme 3: Online strategies.** Once strategies and investments were made, online strategies were implemented, such as newsfeeds, music and audio

| Strategizing | • “Engage more deeply with the content and with others”  
• “Encouraging audiences to procreate and raise a new generation of listeners”  
• “Explore new ways to share content and to mix local and national news” |
| Investments and future journalism | • “A new $3 million online journalism venture ‘created to produce in-depth, local coverage on subjects critical to communities and the nation’”  
• “A project to develop new forms of reporting”  
• “Medium’s audience, distribution, revenue, and content are finally coming together,” said Jake Shapiro, the chief executive of PRX. “All of us are feeling like we’re at the beginning of a flourishing new ecosystem around podcasts.” |
| Online strategies | • “New service ... allows passersby to access the creators of the city’s public art and give them feedback”  
• “A new immigration blog written and hosted by journalist Leslie Berestein Rojas”  
• “The feature will generate custom downloadable playlists for users who punch in the topics that interest them and the amount of time they want to listen” |

**Table 1. Summary of innovation themes.**
services, internet channels, blogs, and mobile apps. MPR created a new interactive audio service where passersby can “access the creators of the city's public art and give them feedback”. Successes resulted from some of these innovations. For example, when WBEZ “began putting its shows on SoundCloud,” it experienced “large audience spikes.” Efficiency was also accomplished, as when KCRW created a new digital music-submission system that allows users “to create and submit profiles with songs and biography information” for DJs to “share music within the interface,” it speeded up “the whole process.” Other innovative strategies included an immigration blog by KPCC, liveblogging by WBUR's OpenCourt project, and custom downloadable playlists called ‘Discover’ on the WNYC mobile app.

The “audience and diversity” theme illustrates successes, efforts, or strategies of NPR stations to attract or involve the audience in its programming. The “activism” theme includes a station’s participation in projects, movements, campaigns, awareness programs and other collaborative efforts, such as audience participation and showcasing opportunities with other news organizations and stations. The “social media” theme includes the engagement of a station on social media platforms, such as Facebook and Twitter, to share content or promote the station.

**Theme 4: Audience and diversity.** Many articles related to social relevance and innovation focused on audience. In fact, “audience and diversity” was the largest category that appeared among the themes. This category revealed an audience-centered approach for several stations: MPR wanted to develop “new audiences,” KPCC sought “a more diverse audience,” and KCRW desired that its content be delivered “to as wide an audience as possible.” A few stations like MPR and WBEZ went a step further with plans for how they hoped to expand or reach such an audience: MPR “attempted to make classical music more popular among young people” and WBEZ took part in the ad campaign “Interesting People Make Interesting People” that “[encouraged] audiences to procreate and raise a new generation of listeners.”

Some stations were already working to attract audiences by engaging with them to provide greater accessibility of journalism and on an introspective and intellectual level. While WBUR “gives online viewers a front-row seat to see the legal system at work,” WBEZ “investigates and answers questions as voted upon by listeners and digital/online users.” WNYC asked its audience to share their stories and opinions in a variety of subjects, from how they came to care about political issues to what their desired type of music programming was.
| Audience and diversity | • “Efforts to attract a more diverse audience”  
• “Station investigates and answers questions as voted upon by listeners and digital/online viewers”  
• “Gives online viewers a front-row seat to see the legal system at work” |
| Activism | • “The Miami Herald worked with WLRN 91.3 FM to have print reporters prepare and provide news for the local station”  
• “MPR staff chose 15 finalists who were then professionally recorded”  
• “The New York Times and WNYC are collaborating to create an interactive map of bird-watching spots throughout the five boroughs as part of Bird Week, a celebration of avian life in the city” |
| Social media | • “Emphasis on audience participation via Twitter”  
• “Campaign will also include a Facebook application that will help users determine how interesting they are and what type of WBEZ content might appeal to them”  
• “The obligatory #Wits hashtag — has grown into such a vital part of the ‘Wits’ experience, each show now opens with an hour-long ‘Tweet-up,’ where the crowd engages in a sort of virtual happy hour” |

Table 2. Summary of social relevance themes.

**Theme 5: Activism.** To further engage an audience, stations remained relevant by maintaining a presence in the community. Such participation could be showcased at various venues, as was the case for KQED, which promoted Read Across America, and MPR, which chose finalists from dozens of submissions to be professionally recorded and showcased at Fitzgerald Theater. Yet participation could also be shared from the comforts of one’s own home, as WNYC put together a ‘SmartBinge’ campaign to liken “listening to podcasts to binge-watching popular shows through online services like Netflix, Hulu and Amazon Prime.”
This theme also captures participation between NPR stations and other media outlets. The New York Times and WNYC, for example, celebrated Bird Week, a series that revered avian life in the city, by collaborating to creating an interactive map of bird-watching spots throughout the five boroughs. In another collaborative project, Miami Herald’s print reporters helped prepare and provide news for the local station WLRN.

Collaboration, in the case of WNYC, also extended to local public schools as the station worked on a site called SchoolBook.org to offer news and data on the city’s public schools system.

**Theme 6: Social media.** WNYC’s ‘SmartBinge’ campaign encouraging listeners to send tweets about listening to WNYC podcasts emboldened the Twitter hashtag “#SmartBinge is the new black.” Social media was used to create a community for a station’s listeners. MPR used Twitter as a “virtual happy hour” where participants tweeted missives before, during, and after each performance to a live public radio show that called Wits through the use of the hashtag #Wits, which proved to be a “vital part of the ‘Wits' experience” as each show now opens with an hour-long ‘Tweet-up.’

Social media was also used as a tool to further connect audiences back to their stations, as shown in WBEZ's Facebook application to help determine audience interests and what type of WBEZ content might appeal to them.

Such computer-mediated technologies were also used as a reporting tool, as WBUR made a Massachusetts courtroom accessible as a “Twittering, Facebooking free-for-all” and invited its audiences to take part in the social media storytelling process. The station re-tweeted compelling, court-related tweets from personal Twitter accounts for this Open Court project.

**Discussion**

This study aims to examine the movement of social relevance and innovation at NPR stations through its news media coverage. Results show that only about 23 percent (N = 81) of the articles reviewed were related to this effort. While these themes are individually described, they are closely interrelated. The following figure illustrates the relationship among these emerged themes.
Articles about the stations often alluded to efforts to strategize, invest, and look to the future. Some articles implied a station was involved in an earlier stage of incorporating change, such as vocalizing ideas and visions to attract an audience, while other articles revealed stations had already incorporated changes in programming and online strategies to cultivate an audience.

Figure 1 is a conceptual framework that illustrates a process, based on my speculations, by which NPR stations aim to be socially relevant and innovative. The initial stages would include ideas of a particular goal or
avenue to reach that goal. This stage reveals the beginning of a process, such as identifying a funding source or detailing a budget, that allows for such changes to be implemented. From that point on, NPR stations may have different approaches.

Second down the chain in Figure 1 is “investments and future journalism,” a broad category that demonstrates stations are engaged in a process of becoming increasingly innovative or relevant to their audiences. This section branches off into two venues, programming and outreach, by which a station can create such a change. From the “programming” branch develops the theme of “online strategies,” revealing a focus of programming through the Internet.

On the other “outreach” side of the diagram, the “audience and diversity” category does not imply courses of action have been taken, but recognizes a need to work more closely and connect with the community. This category identifies both general and specific means by which a station may attempt to do so. Such an approach and focus manifest through two other themes, “activism” and “social media,” which take a station’s efforts one step further by providing concrete and clear visualizations of efforts of the station to work more closely with the community and noting what avenues the station used to accomplish such feats.

Of all the themes studied, the most prevailing and established theme is “audience and diversity.” Based on my descriptive analysis, NPR stations’ top priority, in line with NPR’s mission and vision, centers on its audience. However, it is unclear whether news articles contain bias, as it is common knowledge that NPR stations are dependent on their audience’s financial contributions. These news articles could be echoing such a sentiment through documenting and highlighting stations’ efforts to address its audience. Yet, it is also possible that NPR stations have demonstrated a commitment to its public, who provide the stations with financial stability and are central to shaping NPR’s future.

By utilizing social media, conducting online forums, and embracing new journalistic avenues such as podcasts, NPR stations reveal they are not only innovating, but remaining engaged and relevant in the digital age. Although news articles reference no notable plans for how stations will attempt to adapt in the years to come, NPR’s strategies—which include mobile apps, online streaming, and liveblogging—reveal how stations hope to attract or are attracting an audience. According to my descriptive analysis, one of the stations embodying social relevance and innovation is KCRW, whose reliance
on new products, including a “customized playlist on Pandora or Spotify to an iTunes stream,” stems from a duty to reach the “increasingly fragmented world of online radio.” This finding also indicates that NPR stations are aware that to continue to thrive, they must respect and embrace the technological advances that change the ways news is delivered, consumed, and shared. NPR stations’ social relevance and innovative efforts reveal that modern public radio is still taking steps to act in the public interest.

While analysis shows NPR’s efforts to engage and remain relevant to its audience, it neither speaks to audience needs nor addresses if those needs are being met. To address those needs, interviews with audience members should be conducted. This study, solely relying on the analysis of news content without audience feedback, cannot adequately measure to what extent NPR stations are remaining relevant.

This study is also limited in that it has not taken news coverage data from all NPR stations. Results therefore cannot truly be representative of all the news articles published about all NPR stations. Having selected stations that were found to be the most “innovative”, results of this study therefore may be skewed, possibly illuminating NPR stations as more innovative and socially relevant than in reality.

Another limitation lies in the framework of interconnected themes in Figure 1. While it presents a useful perspective about the process NPR stations could use to stay relevant, Figure 1 has not been substantiated by enough direct evidence, but rather through conjecture.

A fourth limitation of the study is the date range placed on these articles, which don’t encompass articles written before or after the dates selected on LexisNexis. It is possible that articles that did not fit my selected timeframe would reveal an increasingly lacking or fruitful case about stations’ programs and services that could alter results.

A more central limitation is that it is unclear whether news articles adequately capture NPR stations’ efforts in the areas of social relevance and innovation. It is possible that newspapers, many of which are choking under budget cuts, are unable to follow or cover trends and changes in NPR.

Future research is needed to provide a comparison between all NPR stations and its competitors to comparatively measure success. Thus, further research should determine whether the finding of this study reveals a triumph or a loss for NPR. Is 23 percent a step towards the future or a sign that NPR lags behind?
Research is also needed to determine whether NPR stations are getting sufficient coverage in the news media, particularly in newspapers, and whether such coverage accurately portrays NPR. Nevertheless, there is reason to believe content depicting NPR’s efforts to be innovative and socially relevant typically would not go untold or unnoticed, as the nonprofit maintains a large presence in the country and in the world.

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INCREMENTAL STRATEGY-ORIENTED FEEDBACK PROMOTES POSITIVE LEADERSHIP PERCEPTIONS AND FEEDBACK REACTIONS

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Abstract

In our lab experiment, participants who received negative strategy-oriented feedback associated with an incremental theory had more positive perceptions of a feedback deliverer and the feedback itself compared to recipients of comfort-oriented feedback associated with an entity theory.

In almost every domain of life, we encounter the need to collaborate within a leader-follower dyad. Although many individuals are appointed as “leaders,” a title alone cannot manifest effective guidance and direction. For years, researchers have mulled over what factors contribute to the success of those who hold leadership positions (Bass, 1985; Fiedler & Chemers, 1967; Northouse, 2012). High quality feedback and low perceptions of leader-follower distance emerge as predictors of leadership effectiveness (Mulder & Ellinger, 2013; Antonakis & Atwater, 2002). Both variables affect various elements of the broad term “leadership” and influence the relations one has with followers (Kark & Shamir, 2013). According to Riggio and Lee (2007), a crucial component of successful leadership entails delivering constructive feedback. Thus, as a large and essential branch stemming off of effective leadership, feedback is the primary component I focus on. The type of feedback participants receive not only affects their perceptions of the feedback itself, but also influences their thoughts of the deliverer’s leadership abilities. This experiment interplays individual’s leader-follower distance with implicit theories to establish their impact on feedback effectiveness and its relatedness to perceived leadership effectiveness.
Implicit Theories and Their Roles in Performance Feedback

Carol Dweck’s (1986) seminal work on motivational processes initiated years of research on the implications of implicit theories. She theorizes that individuals hold either one of two implicit theories that determine one’s mindset about their ability to change. Entity theorists believe their attributes are fixed, as opposed to incremental theorists who view them as malleable (Dweck, 1995). Researchers have analyzed individuals’ implicit theories of intelligence, personality, and emotion through entity and incremental beliefs (Blackwell, Trzesniewski, & Dweck, 2007; Erdley & Dweck, 1993; Tamir, John, Strivastiva, & Gross, 2007). In each of these cases, the theory one holds influences their motivational patterns and intent for achievement behavior. As entity theorists believe the attribute at hand is fixed, they show little effort in improving performance. Since incremental theorists believe the attribute can change over time, they strive to improve performance (Dweck & Leggett, 1988).

A longitudinal study by Heslin, Latham and VandeWalle (2005) investigated how managers’ natural implicit person theories are related to how they acknowledge change in their employees throughout the performance appraisal process. The results of this study confirm that the implicit theory held by the feedback giver has an effect on the perceived performance of the employee over time. These findings align with those of Rattan, Good, and Dweck (2012) in which they examined instructors’ implicit theories’ role in the structure of their feedback delivery to undergraduate students. Although their research occurred in an academic context opposed to an organizational context, the findings align with the current study despite the setting. In this study, the instructors’ mindsets affected the feedback quality given to their students. Instructors with entity mindsets gave “comfort-feedback”, explaining that poor math skills were due to a lack of math intelligence (e.g., “Not everyone is a math person”). On the other hand, incremental theorists gave “strategy-feedback” explaining that poor math skills were due to a lack of hard work (e.g. “I want you to change your study strategies and consider working with a tutor”). Students who received their instructors’ incremental/strategy feedback felt the instructors were more invested in their future, had more positive perceptions of their instructor, were more motivated and encouraged, and expected to improve their performance in the future. Therefore, the implicit theory an instructor holds translates into the feedback given, which further influences the implicit theory the students hold about themselves.
For virtually any task, effective negative feedback should enhance subordinates’ understanding of leaders’ future expectations. Strategy-oriented feedback communicates guidelines and high standards, which then leads to greater effort and engagement (Cohen, Steele, & Ross, 1999). In accordance with the literature, the current study assumes detailed and personal feedback will allow the receiver to have confidence in their future tasks, a clear understanding of expectations, and motivation to improve.

**Leader-Follower Distance: An Overview**

The second variable manipulated in this study is the perception of leader-follower distance. Throughout the twentieth century, the curator of distance in both sociology and psychology was Emory Bogardus through his creation of the Bogardus Social Distance Scale (1925a). He developed this scale after reviewing the work of Simmel (1908) and Park (1924), who conceptualized distance as both a spatial and social construct. Bogardus’ (1925a) social distance scale was arguably the first way sociologists and psychologists were able to quantifiably measure participants’ perceptions of distance from a given race or class. A few years later, he applied his distance framework to the domain of leadership (Bogardus, 1927). He elaborated that distance had two dimensions: vertical and horizontal. Vertical distance referred to the differences between two people’s achievements in an organization, whereas horizontal distance referred to differences between task values of two equally ranked employees.

The concept of vertical distance continues to be accepted as a dimension of social distance in leadership contexts today. It is implemented in Antonakis and Atwater’s (2002) framework, which states there are three dimensions of distance in an organizational context: physical, social, and number of interactions. Physical distance is defined as how close or far individuals are located to each other. Less strict interpretations of the term include more subjective experiences, such as perceived physical presence and electronic propinquity (i.e., online “nearness,” opportunity to converse). The next dimension, social distance, concerns perceived differences in both formal and informal status, rank, authority, and achievement (Antonakis & Atwater, 2002). This dimension also encompasses emotional reactions and feelings of closeness (Bogardus, 1947). Finally, interaction frequency involves the amount of leader-initiated contact with follower (Bligh & Riggio, 2013). These three interrelated elements affect the overall distance one perceives. Distance in organizational relationships can create various detrimental circumstances.
for leaders, such as trouble maintaining authentic leadership (i.e., genuine relationship with followers), inability to recognize followers’ unique abilities and needs, and cynical reactions and resistance to direction (Collinson, 2005).

**Dimensions of Distance in an Organizational Context**

Physical distance is generally referred to as how close or far two individuals are from each other at any given point in time. Although this concept may seem quite apparent to some, there are multiple variations to the construct’s definition (e.g., many relate physical and social aspects). However, Antonakis and Atwater’s (2002) framework clearly states that physical and social distance are independent of each other. Therefore, physical distance is viewed in measurable units such as feet or miles. In some scenarios, such as completing autonomous or complex tasks, physical distance from your supervisor can be beneficial (Keslier & Cummings, 2002). However, it generally is related to negative organizational outcomes. Kerr and Jermier (1978) claim that physical distance can make effective leadership impossible. As companies expand and technology becomes increasingly pertinent in organizational communication, subjective experiences and seemingly online nearness have become important aspects of physical distance. Consequently, I look at participants’ perceived physical distance from the feedback deliverer in my study.

Social distance can be defined as how one perceives that they differ in informal and formal status or authority (Bogardus, 1927). Socially close leaders make an effort to relate to their followers despite the difference in their ranking. Subordinates describe them as high on energy and interpersonal skills, dynamic, and intelligent. Furthermore, followers express that they wish to identify with a close leader and are more likely to emulate role-model leadership behavior (Cole, Bruch, & Shamir, 2009).

The number or expectancy of interactions with a leader also plays a crucial role in organizational relations. Expecting interactions creates accountability and awareness on both the leader and follower’s ends (Bligh & Riggio, 2013).

**Distance’s Role in Leader-Follower Relations**

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The onset of globalization, hypercompetitive markets, and increase of online technology has created a monumental shift towards having organizations’ work locations spread across the globe (Cascio & Aguinis, 2011). Due to these changes in organizational settings, exploring the relationship between distance and leader-follower perceptions is imperative. Followers who have the opportunity to work closely with their leader will base their perceptions of them on direct experience. However, followers who are distant from their leader are more likely to base their perceptions on reputation and ungrounded judgment (Bligh & Riggio, 2013). The same applies for the leader. A close leader will base their perceptions, attitudes, and behaviors toward the follower off of experience, whereas a distant leader bases them off of mental images they have created. Therefore, distance influences the way leaders and followers view and interact with each other.

**Intersection of Incremental Feedback and Distance**

With an increase in globalization, workers are more likely to come from a variety of backgrounds; accordingly, leaders may have followers with social identities that do not align with their own. This is where it is imperative that leaders refrain from prejudice, which would increase their social distance. Implicit theories affect the way individuals’ interact with others who have a social identity different than their own (Hong et al., 2004). Specifically, incremental theorists are more likely to modify their social identity to form an “us” category rather than a “them” category. Therefore, incremental mindsets should aid in intergroup interactions. The literature allows us to see that these constructs are independently imperative for leadership effectiveness (Atonakis & Atwater, 2002; Rattan, Good, & Dweck, 2012). However, previous studies do not examine the effects of their interaction as in the current study. The current research design systematically examines how perceived distance and strategy oriented feedback influence one’s thoughts about the effectiveness of the feedback itself, and consequently the effectiveness of the leader.

In accordance with the literature, I hypothesize the effects of distance and feedback on feedback reactions and leadership perceptions.

**HYPOTHESIS 1**
Participants who receive negative incremental feedback will have more positive ratings on feedback reactions and leadership perceptions than those who receive negative entity feedback.

HYPOTHESIS 2
Participants with an interaction opportunity will give more positive ratings on feedback reactions and leadership perceptions than those in the no interaction opportunity.

HYPOTHESIS 3
Participants in the incremental and interaction opportunity will have the most positive feedback reactions and leader perceptions.

Method

PARTICIPANTS
Participants were undergraduate students from the Indianapolis area ($N = 110$). Approximately 25% of the participants identified as male, and 75% identified as female. The mean age of participants was 19.5 years old. 13.6% of participants had completed at least one business related course, whereas nearly 26% completed at least one social science related course. Participants were recruited through lab members’ networks and Sona Systems, an online website where students with registered accounts can sign up for extra credit for their psychology courses. Students who did not receive extra credit were compensated with one free pizza coupon for HotBox pizza.

PROCEDURE
Upon beginning the study, participants were asked to sign an informed consent form and received a brief overview of the study. The randomly assigned experimental condition determined which script the lab instructor would use to give the study description (see Appendix A). All participants were told that our lab was working with a data science team at another local university in Indianapolis, specifically with a graduate student named RJ. However, participants in the interaction conditions were told that RJ was working next door and would discuss the study with them upon its completion. Participants
in the no interaction conditions were told that RJ would contact them via email later on concerning questions or comments about the study.

The differences within the conditions were created to prime participants to perceive RJ as either a proximal or distant leader. The script for the no interaction condition was designed to make RJ appear physically distant from the lab, socially occupied at the moment, and unable to complete a face-to-face interaction with the participant. The interaction condition was designed to have the participant believe RJ was physically nearby, socially available, and eagerly waiting to interact. The contrasts in scripts delivered to participants was to create varying perceptions of distance towards their “leader”. After receiving the appropriate study description, they were seated at a computer. Participants initially completed demographic questions and a feedback orientation scale. Next, they were instructed to let the lab instructor know they were ready to begin their first task. The lab instructor provided them with an assessment center packet containing a human resource management task that required participants to rank ten employees (i.e., 1 = least expendable, 10 = most expendable) due to their work downsizing (see Appendix B). Each packet contained instructions, a company profile, employee profiles, and criteria to make layoff decisions. Before they began the task, participants were told they would have ten minutes to complete it and would receive feedback on their performance. Lab instructors made a point to emphasize that the participants’ feedback was a product of a computer algorithm that was created by and used the language of RJ and his team.

To make the bogus manipulated feedback more believable, lab instructors gave participants an implicit regulatory task after they submitted their answers. Participants were told they would complete this sheet for five minutes as the computer algorithm processed their results. This was an attempt to refrain from giving participants their feedback mere seconds after they submitted their answers, which could raise questions about the feedback’s credibility. Therefore, after completing the implicit regulatory task for five minutes, participants were allowed to view their feedback on the computer. All participants received bogus negative feedback regarding their performance on the assessment center task. Their actual results were not calculated. The type of negative feedback received was dependent on their randomly assigned condition. Participants in the incremental conditions received strategy-oriented feedback, whereas those in the entity conditions received comfort-oriented feedback.

Finally, participants moved on to a handful of dependent measures when they finished reading their negative feedback. These measures were
used to see if the distance and feedback manipulations produced different results for the participants’ perceptions of RJ and the feedback itself. When the final measures were completed, participants were debriefed and received either extra credit or a HotBox coupon.

MEASURES

Feedback Orientation Scale. The measure of feedback orientation employed in this study allows us to see individual differences in overall receptivity to feedback (Linderbaum & Levy, 2010). This 25-item scale scores individual differences on a Likert type scale, ranging from 1 = strongly disagree to 5 = strongly agree, $\alpha = .79$. It consists of four subscales, utility, accountability, social awareness, and feedback self-efficacy. It consists of items such as, “To develop my work, I rely on feedback”, “It is my responsibility to apply feedback to improve my performance”, “Feedback helps me manage the impression I make on others”, and “I feel self-assured when dealing with feedback”.

PANAS. The measure of positive affect and negative affect employed in this study is a 20-item measure with subscales of 10 items for positive and negative affect. It is used to indicate participants’ feelings at the current moment they completed it (Clark & Tellegen, 1987), $\alpha = .83$, It is scored on a Likert-type scale, ranging from 1 = very slightly or not at all to 5 = extremely. Ten of the items indicate positive affect (e.g., interested) and 10 items indicate negative affect (e.g., ashamed).

Perceived Fairness of Outcome Feedback. The measure of perceived fairness of feedback employed in this study is the 4-item measure adapted from Keeping, Makiney, Levy, Moon, & Gillette (1999) scored on 7-point scales ranging from 1 = strongly disagree to 7 = strongly agree, $\alpha = .91$. The scale includes the item, “I agree with the way my performance was rated.”

Perceived Utility of Process Feedback. The measure of perceived utility employed in this study is the 4-item measure adapted Greller (1978), $\alpha = .96$. This scale includes the item, “The feedback helped me learn how I can the task better,” scored on 4-point scales ranging from 1 = I do not feel this way at all, not at all and 4 = I feel exactly this way, completely.

Outcome Feedback Accuracy. The measure of feedback accuracy used is the 7-item questionnaire developed by Stone, Gueutal, & McIntosh (1984), $\alpha = .85$. This measure is scored on a 7-point scale ranging from 1 = strongly disagree and 7 = strongly agree. There are two items that are reverse scored in
order to control for carryover and practice effects (e.g., “I do not feel the feedback reflected my actual performance”).

**Motivation to Use Feedback.** The measure of motivation to use feedback is used in order to effectively measure students’ motivation to use the performance feedback they received (Dorfman, Stephan, & Loveland, 1986), $\alpha = .83$. This scale is comprised of two Likert type questions and includes the item, “I want to improve performance based on the feedback my supervisor provides.”, rated from 1 = strongly disagree to 7 = strongly agree.

**PEET.** The Perceptions of an Environmental Entity Theory developed by Good et al. (in press) is slightly modified in this study to determine participants’ perceptions of their ability to change, specifically their business acumen, $\alpha = .88$. It is a 4-item scale, ranging from 1 = strongly disagree to 8 = strongly agree. It includes items such as, “I have a certain amount of intelligence concerning business acumen and I can’t really do much to change it”.

**Leadership Perceptions.** The leader perceptions measure developed by Lord, Foti, & DeVader (1984) is employed in this study to indicate participants’ perceptions of the individual who gave them feedback (i.e., their rater, RJ), $\alpha = .89$. It is a 5-item scale, ranging from 1 = strongly disagree to 5 = strongly agree. It includes items such as, “The rater fit my image of a leader.”

**Results**

Throughout data collection, lab members noted if a participant was unable to run through the experiment as intended or made it clear they did not believe the manipulations in feedback or interaction opportunity. Lab members would clearly mark these participants in our records. In total 11 participants either did not complete the experiment accurately or were identified to have guessed the deception, and thus were excluded from our analysis (resulting $N = 110$).

Descriptive statistics for key variables can be found in **Table 1**. A correlation matrix including key variables in the present study can be found in **Table 2**. One of the scales, Perceptions of an Environmental Entity Theory (PEET), has several significant correlations with other measures used in this study. The PEET measures participants’ perceptions of their ability to change, specifically their business acumen. High scores indicate a more entity focused orientation whereas low scores indicate a more incremental mindset.

<table>
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<th>Condition</th>
<th>Measure</th>
<th>M</th>
<th>SD</th>
<th>N</th>
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### Table 1. Descriptive statistics for key variables.

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<th>Variable</th>
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<td></td>
<td>Motivation to use feedback</td>
<td>5.56</td>
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<td>Leadership perceptions</td>
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<tr>
<td></td>
<td>Leadership perceptions</td>
<td>2.90</td>
<td>1.04</td>
<td>32</td>
<td></td>
<td></td>
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</table>

Note. *N* = 110 where incremental (*n* = 55) and Entity (*n* = 55), Interaction (*n* = 40) and No Interaction (*n* = 70).

* *p < .05*

** *p < .01*
Negative Affect  1.75  0.66  -.05 (.88)
PEET                  3.44  1.59  -.21  .25* (.88)
Perceived Fairness   4.05  1.24  .22*  -.19  -.18 (.91)
Motivation to Use Feedback   4.94  1.38  .20*  .05  -.26  .5** (.83)
Outcome Accuracy        3.93  1.84  .10  .04  .08  .6**  .4** (.85)
Perceived Utility       3.76  1.84  .33*  -.17  -.23*  .4**  .6**  .3** (.96)
Leadership Perceptions   3.16  0.86  .31*  -.10  -.22*  .5**  .5**  .4**  .7** (.89)

Note. \( N = 110 \). Numbers in parentheses are Cronbach’s alphas.

* \( p < .01 \)

** \( p < .001 \)

Table 2. Descriptive statistics for key variables.

These ratings are positively correlated with the Negative Affect subscale (e.g., ashamed, disinterested) of the PANAS measure, \( r(110) = .25, p < .01 \). The PEET also has negative relationships with two of our feedback reaction scales, Motivation to Use Feedback, \( r(110) = -.26, p < .01 \), and Perceived Utility of Process Feedback, \( r(110) = -.43, p < .001 \). In addition, the PEET is negatively correlated with the Leadership Perception scale, \( r(110) = -.22, p < .01 \), which indicates participants’ perceptions of the leader who gave them feedback. These relationships imply that participants with entity mindsets feel stronger negative affect after receiving critical feedback, are less motivated to use the feedback, found the feedback less helpful, and have poorer perceptions of the leader who gives them feedback.

I hypothesized that participants who received incremental feedback would have more positive feedback reactions and leader perceptions compared to those who received entity feedback. After running a MANOVA with all feedback reaction measures, a significant main effect of feedback type supports Hypothesis 1, Wilks’ Lambda = .677, \( F(4,1103) = 12.309, p = .00, \eta^2 = .323 \) (see Table 3). Those who receive incremental feedback opposed to entity feedback

<table>
<thead>
<tr>
<th>Feedback</th>
<th>( F )</th>
<th>( p )</th>
<th>( \eta^2 )</th>
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<tr>
<td>Omnibus</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Feedback</td>
<td>12.31**</td>
<td>0.00**</td>
<td>0.32</td>
</tr>
</tbody>
</table>

83
<table>
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<tr>
<th>Feedback Type</th>
<th>F</th>
<th>p</th>
<th>η²</th>
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<tbody>
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<td>Distance</td>
<td>1.12</td>
<td>0.35</td>
<td>0.04</td>
</tr>
<tr>
<td>Feedback*Distance</td>
<td>0.40</td>
<td>0.81</td>
<td>0.02</td>
</tr>
<tr>
<td>Perceived Fairness</td>
<td>3.93*</td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>Motivation to Use Feedback</td>
<td>12.77**</td>
<td>0.00</td>
<td>0.11</td>
</tr>
<tr>
<td>Outcome Accuracy</td>
<td>0.74</td>
<td>0.39</td>
<td>0.01</td>
</tr>
<tr>
<td>Perceived Utility</td>
<td>48.77**</td>
<td>0.00</td>
<td>0.32</td>
</tr>
</tbody>
</table>

Table 3. Omnibus and univariate results of feedback type on feedback reactions.

Table 4. MANOVA: Effects of feedback and distance on leadership perceptions.

perceive it to be a fairer judgement of their performance, $F(1,106) = 3.93, p = .05, η^2 = .02$, are more motivated to improve performance, $F(1,106) = 12.77, p = .001, η^2 = .11$, and are more likely to use it as a guide to improve performance, $F(1,106) = 48.77, p = .00, η^2 = .32$ (see Table 3).

The results also find participants’ feedback orientation (i.e., overall receptivity to feedback) to be a significant covariate for the feedback reaction scales, $F(4,102) = 3.26, p = .00, η^2 = .31$. Participants who receive incremental
feedback also have more positive leadership perceptions than those who receive entity feedback, Wilks' Lambda = .675, $F(1,106) = 12.76, p = .001, \eta^2 = .107$ (see Table 4).

I also hypothesized that participants who were told they would have an interaction opportunity would have more positive feedback reactions and leadership perceptions than those who had no interaction opportunity. The distance manipulation does not yield results to support Hypothesis 2 for either feedback reactions, $F(4,103) = 1.12, p = .35, \eta^2 = .04$ (see Table 3), or leader perceptions, $F(1,106) = .03, p = .857, \eta^2 = .00$ (see Table 4).

Finally, it was hypothesized that individuals who would have an interaction opportunity and received incremental feedback would have the highest overall leadership perceptions. Contrary to Hypothesis 3, there is no significant interaction for feedback reactions $F(4,103)= .40, p = .81, \eta^2 = .02$ (see Table 3), or leadership perceptions, $F(1,106) = .22, p = .64, \eta^2 = .00$ (see Table 4).

**Discussion**

In accordance with research on feedback and leader-follower distance, this study sought to expand on previous findings by combining feedback and distance variables in an organizational context. My purpose was to discover the influence of feedback driven by implicit person theory and leader-follower distance on participants' feedback reactions and leader perceptions. Specifically, this study aimed to see differences in participants’ motivation and perceptions of fairness, outcome accuracy, and utility when their feedback content was influenced by an implicit theory mindset (i.e., incremental or entity). In addition, differences in leadership perceptions were expected depending on the expectation for an interaction or not with the leader (i.e., feedback giver). All in all, this study sought to test for an interaction between feedback and distance, such that individuals who received incremental feedback and expected an interaction with a leader figure would have the highest overall feedback reactions and leadership perceptions.

The small to moderate effect sizes of the manipulations on the feedback reaction scales suggests several implications. First, individuals are more likely to view feedback as fair and fitting to their performance when it is strategy-oriented. They are also more motivated to use the feedback to improve their performance and continue reaching their goal. In addition, they believe that the feedback accurately reflected their results. Finally, individuals will
use the feedback as a guide to make changes in accordance to their performance if it contains strategies and high expectations to do so.

Unlike our feedback main effect, there is no significant effect for distance on feedback reactions and there is no significant interaction between feedback and distance. This suggests that individuals’ perceptions of fairness, motivation, outcome accuracy, and utility are not affected by whether or not they believed they would get an interaction opportunity. In this study, distance is designed to include the three aspects of distance: physical, social, and interaction opportunity (Antonakis & Atwater, 2002). The “interaction opportunity” condition narrates RJ (i.e., the leader and feedback deliverer) as next door, a grad student, and available to interact face-to-face with participants. However, the “no interaction” condition narrates RJ as somewhere around campus, a grad student, and perhaps able to interact at a later time via email. It is assumed that participants are primed into perceiving RJ as either a proximal or distant leader. According to Kalkstein, Kleiman, Waskslak, Liberman, & Trope (2016), individuals tend to learn better from and favor proximal leaders when working on low-construal tasks (i.e., concrete, local, contextualized). This study includes a human resource task that is quite contextualized and needs a concrete list of answers. Thus, it was expected that participants would have higher feedback reactions and leadership perceptions when told he was next door and they would interact.

However, distance also has no significant main effect on leadership perceptions. Therefore, the instructions and feedback given to participants may have affected their perceptions more than the ability to later interact with RJ. This may be one explanation for the nonsignificant effects and interaction, but other limitations will be discussed later on. The strong feedback main effect of feedback on leadership perceptions indicates that participants who received incremental feedback not only react more positively to the feedback itself, but also to the leader. They found RJ to have exhibited leadership, engaged in leader behavior, a typical leader, fitting their image of a leader, and would have chosen him to be their formal leader at work. These results provide further evidence that feedback is a crucial antecedent to leadership effectiveness and perceptions (Riggio & Lee, 2007). Therefore, leaders should invest time into the content of their feedback to encourage positive perceptions and relationships with their subordinates.

LIMITATIONS AND IMPLICATIONS FOR FURTHER RESEARCH
Although the present study does find significant relations to provide additional insight into feedback, distance, and leadership, it still contains limitations. Perhaps the most apparent limitation is the construction of the distance manipulation. With the resources and context given for this study, our lab attempted to create the manipulation to be as believable and practical as possible. However, several aspects within the structure of the distance manipulation could have gone awry leading to insignificant effects. First, the entire narrative of RJ and his location is all held within the initial script that lab members recite to participants as they enter the lab. There were 15 different lab members running this study, which gives room to a variety of interactions and script delivery. These lab members also used personal networks as a recruiting tool and were able to run a participant whenever was most convenient for both individuals. Thus, personal relationships with participants may have decreased the level of seriousness and believability in certain run-throughs. Another recruiting method used was Butler Sona Systems, an online account where psychology students can receive extra credit in their courses for participation in studies. This attracted many upper level psychology students who are keen of deception to our sample pool. Although suspicious data was dropped, there may have been some participants overlooked. All in all, if one line of the script was forgotten or delivered unprofessionally, the distance manipulation was likely affected.

Feedback delivery may have been another component of the study’s structure that caused the lack of a significant effect. Participants were presented feedback on a computer screen, not aloud by an actual human being. Although told that the feedback was generated through a computer algorithm made by RJ, it may not have been taken as seriously or personally. Also due to the feedback being delivered on a computer, feedback was skipped over or arrived at too quickly. The bogus negative feedback was presented to participants virtually on the same laptop they used to rate all measures and enter answers for the human resource management task. After entering their answers for the task they were to be evaluated on, they were instructed to notify the lab instructor to complete another task while their results and feedback were being processed. This procedure was used in an attempt to make the feedback seem more believable and particular to their performance, not previously generated. However, some participants clicked on a continue button before notifying the lab instructor they completed the task, thus reviewing the feedback immediately with no time in between. Other participants clicked continue multiple times and skipped over the feedback altogether. Lab members made note of participants who did this and data was dropped; however, there is the possibility some cases were overlooked.
Finally, many of the theories and research reviewed while constructing this study took place in either an academic or organizational setting. Due to inabilities to work onsite with a specific organization or academic course, the present study was performed in a controlled experimental setting. Unable to hire an actor, I employed deception to create a fictional leader who would give feedback and perhaps interact. Many took RJ seriously and were shocked to realize he was not real after being debriefed; however, others may have not taken the intensity of RJ’s role into consideration when completing measures and reading feedback. A manipulation check could have assessed this in a more systematic fashion.

With these limitations in mind, future research could make specific changes to this study’s procedures to ensure stronger manipulation and fewer technical errors. I believe recruiting from a participant pool of individuals who work within an organizational context will eliminate suspicions of deception found in our psychology student participants. The present study, the feedback given to participants concerned their performance on a human resource management task. If participants received feedback on a task that was relevant to their particular job description, perhaps they would elicit stronger feedback reactions. In an organizational context, I may be able to strengthen the distance manipulation, as well. In order for the interaction opportunity condition to yield significantly higher feedback reactions and leadership perceptions, participants needed to fully believe the fictional leader was working next door and about to discuss their results face-to-face. Participants may find it more plausible that an individual in upper level management within their organization was going to evaluate their performance on a job task. Depending on the randomly assigned condition, participants would be told if they were available later to discuss their feedback in person or not. In addition, the number of participants in the interaction (n = 40) and no interaction (n = 70) conditions were extremely uneven. Although participants were randomly assigned to the conditions, this difference could have contributed to the insignificant effects of the manipulation. In sum, these changes in the procedure of this present study could strengthen the distance manipulation.

Employee engagement is strongly associated with job satisfaction, organizational commitment, and turnover intentions, and leadership is one of the most crucial factors influencing it (Schaufeli & Salanova, 2007). Since the attitudes and actions involved in employee engagement are imperative for an organization’s success, I would hope to further investigate the role of distance in encouraging employee engagement. Avolio, Walumbwa, and Weber (2009) found that distant leaders need to take the initiative to provide resources
(e.g., role clarification, rewards) through different pathways than face-to-face leaders. I would like to explore those pathways and see how distant leaders can remain effective. In particular, it could be helpful to research feedback delivery effectiveness of virtual leaders as it is not very present in current feedback literature.

It would be beneficial to delve deeper into studying implicit mindsets and their affect on feedback content. Even when applied to adults in a non-academic context, feedback that includes high standards along with a plan of action is received far better than feedback that simply comforts an individual for their incapability (Mulder & Ellinger, 2013). Rattan, Good, & Dweck (2012) suggest that an incremental mindset is crucial in developing feedback of this nature. Thus a further implication may be that while giving negative feedback, it is important to have an incremental mindset, which will influence feedback content. As a leader, maintaining an incremental mindset about followers should be imperative as one constructs and delivers critical feedback concerning performance.

Conclusion

The present study expands on feedback affected by implicit theories and distance’s role in the way individuals react to feedback and perceive the feedback deliverer. The results indicate that having an incremental mindset to construct strategy-oriented feedback is beneficial, as it leads to positive feedback reactions and leadership perceptions. With this knowledge, leaders can make an effort to display encouragement, high standards, and pathways to improvement within the feedback they deliver to their followers.

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Appendix A
LAB INSTRUCTOR SCRIPT

Interaction Opportunity:

Hello,

• Please read through and fill out the statement of informed consent.
• You will start this study by completing a few questionnaires on the computer.
• There is a grad student named RJ here from IUPUI’s data science program. He is piloting a task that could potentially be used for hiring managerial positions. As a Butler research lab, we have partnered with him to see whether his findings are generalizable across public and private campuses. He is currently next door working.
• I will give you the assessment included in his research and you will be given 10 minutes to complete it. Please write down questions or comments you have during the task, as well as what goes through your mind and how you are feeling.
• When time is up, I’ll notify you and we can submit your answers.
• It is important for you to know that your performance on the task will be evaluated. Specifically, the program implements a scoring algorithm developed by the research team of which RJ is a part.
• Once you receive your performance feedback, you will complete a handful of questionnaires on the computer.
• Afterward, RJ will come over and explain details about the task to you, or answer any questions or concerns you have. He’d also like to see the thoughts or feelings you wrote about while completing the task.
• If you have any questions, please let me know.

No Interaction Opportunity:

Hello,

• Please read through and fill out the statement of informed consent.
• You will start this study by completing a few questionnaires on the computer.
• There is a grad student named RJ around our campus from IUPUI’s data science program. He is piloting a task that could potentially be used for hiring managerial positions. As a Butler research lab, we
have partnered with him to see whether his findings are generalizable across public and private campuses.

- I will give you the assessment included in his research and you will be given 10 minutes to complete it. Please write down questions or comments you have during the task, as well as what goes through your mind and how you are feeling.
- When time is up, I’ll notify you and we can submit your answers.
- It is important for you to know that your performance on the task will be evaluated. Specifically, the program implements a scoring algorithm developed by the research team of which RJ is a part.
- Once you receive your performance feedback, you will complete a handful of questionnaires on the computer.
- Afterward, RJ will contact you and explain details about the task to you, or answer any questions or concerns you have. He’d also like to see the thoughts or feelings you wrote about while completing the task.

Appendix B
ASSESSMENT CENTER TASK

Step 1

You are one of the executives in charge of talent management in an organization forced to undergo downsizing. Your specific position is to act as Human Resource Manager with hiring and talent management authority for the departments within the organization. Rank-order the 10 employees from “1” for least expendable to “10” for most expendable.

Step 2

Make sure to look over the rankings you have selected to make sure the organization will still run effectively after your decision has been implemented. Make sure each of the different departments are fairly represented in your decision.

COMPANY PROFILE

Delta, started in 1998, is a small, family-owned firm in the microcomputer business. The company grew rapidly because of its microcomputer boards, disk drives, optical disks, tape backup drives, and innovative approaches to solving computer hardware problems. Both managers and workers have put in long hours, often sacrificing their personal time to get the company off the ground. Unfortunately, a significant downturn in the economy has caused a reduction in sales, and it is increasingly apparent that some adjustments will have to be made if the company is to survive. Delta needs to be prepared for a ten percent reduction in work force. The president has asked you to examine the personal information of the 10 employees in the company who are most expendable. Your committee will have to make a series of recommendations for a downsizing (layoff) of employees, all of whom are married, of the same age (28), and all with no previous experience before joining Delta. You are meeting to rank-order the employees from “1” for least likely to “10” for most likely to be laid off. There are at least 11 employees in each of the 5 departments. The employees other than those on the list you have been provided with have been with the company at least eight years, and it is not feasible to lay them off at this time.

Among the criteria you may want to consider in making your rankings are:

1. Education
2. Performance
3. Seniority
4. Technical ability
5. Attitude
6. Leadership
7. Effectiveness
8. Efficiency
9. Job Function
10. Social ability

EMPLOYEE PROFILES

Finance

Gwen—seniority three and one-half years; four-year college education; has performed about average on annual appraisal (75 percent); average technical abilities and leadership potential; a steady, grinding worker; works long hours, has been working on employee benefit plan for two years; is a nonsmoker and nondrinker; has frequently complained about working with cigarette smokers.

Hal—seniority five and one-half years; four-year college education; has been rated average and above in annual appraisals (80 percent); high technical abilities; average leadership; always in on Saturday mornings; frequently works through lunch hour; has been working on committee to computerize payroll for past 18 months; is well liked and gets along with fellow workers; is a very neat and stylish dresser

Research and Development

Carole—Ph.D. in engineering; seniority two and one-half years; has been above-average research engineer in performance appraisal (90 percent); high technical and leadership abilities; works unusual hours (sometimes work late at night, then doesn’t come in until noon the next day); developed patent on a new solid-state circuit device last year; seldom attends social events; is said to be friendly but often disagrees and conflicts with fellow workers.

Dave—M.S. in engineering; seniority three and one-half years; has been average to above average on performance appraisals (75 percent); average technical abilities; average leadership; works steady 8AM to 5PM; is working on several R&D projects but none yet completed; always ready for a coffee
break or joke-telling session; is well liked by coworkers; never complains about bad assignments

Marketing

Tony—M.B.A.; seniority two years; has been rated as performing better than 90 percent on performance appraisals; high technical abilities; above average leadership; works erratic hours (often comes into office at 9:30 and frequently plays golf on Wednesday afternoons); sold the highest number of product units in his product line; seldom socializes with fellow workers; often criticized because his desk is messy and disorganized, piled with correspondence and unanswered memos

Ken—Four-year college degree; seniority 18 months; has been rated an above-average to outstanding performer (80 percent); high technical abilities; average leadership; has been criticized for not making all of his sales calls, but has a good sales record; developed advertising campaign for a new product line; although a good bowler refuses to bowl on company team; has been rumored to drink quite heavily on occasion

Human Resource Management

Eduardo—Four-year college degree; seniority 18 months; has been rated above average as performer (80 percent); average technical abilities; high leadership; is frequently away from his desk and often misses meetings; has designed and implemented a new management development program; is well liked although frequently has differences of opinion with line managers; often takes long coffee breaks and lunch hours

Frank—Two-year college degree; seniority four years; has been rated average to above average as performer (70 percent); low technical abilities; above average leadership; works long hours; regularly attends all meetings; has been redesigning performance appraisal systems for past two years; is involved in many company activities; known as a friendly, easygoing man

Manufacturing

Irv—Four-year college degree; seniority 15 months; rated an outstanding performer (90 percent); high technical abilities; moderate leadership; has been criticized for not attending committee meetings; designed and implemented the computerized production control process; does not socialize with fellow employees; known as sloppy dresser (often wearing white or red socks with a suit, for instance)
Jackie—high school; seniority six years; rated an average performer (75 percent); average technical abilities; low leadership; always attends meetings; works steady 8AM to 5PM hours and Saturday mornings; has chaired committee to improve plant safety for past two years; participates in all social events; plays on company bowling and softball teams; known for a very neat, organized office.
Appendix C

MANIPULATED BOGUS FEEDBACK

Incremental

A team of Human Resource professionals and Organizational Behavior experts has developed an ideal standard by which to evaluate these employees. The sequence in which you recommend firing these employees only has 20% overlap with this ideal standard. In your assessment, you failed to utilize several important skills that would have enabled you to come to a better conclusion regarding the organizational setup of Delta Company. By organizing the company in such a fashion, you have ensured its continued economic struggle. However, by improving on several strategies, I know that you will be able to better analyze the situation and make the better-educated decisions that I’m sure you’re capable of. Make sure to pay special attention to the skills and accomplishments of the particular employees past performance is a strong indicator of future performance. Additionally, it is important to have a strong mixture of subordinates and leaders in those that you keep. It is important not to weight age and/or gender-related information in your decisions. Even though your performance was poor, I am confident in your ability to improve in completing related assignments or making difficult decisions like this in the future.

Entity

A team of Human Resource professionals and Organizational Behavior experts has developed an ideal standard by which to evaluate these employees. The sequence in which you recommend firing these employees only has 20% overlap with this ideal standard. In your assessment, you failed to utilize several important skills that would have enabled you to come to a better conclusion regarding the organizational setup of Delta Company. By organizing the company in such a fashion, you have ensured its continued economic struggle. However, I am sure this assessment does not reflect your personal educational performances. Unfortunately, not everyone is fit to make the kind of decisions that are needed in human resource management. It requires specific decision-making skills that not everyone possesses. I am assuming it is unlikely that you will be completing tasks like this again, so I would not worry. I will take a look at making the next task not as challenging as this one, so individuals like you feel more comfortable completing it. I want you to know that your score is okay, and this is merely an assessment that doesn’t reflect your overall abilities. Even though your performance was
poor, I am confident in your ability to improve in completing related assignments or making difficult decisions similar to this in the future.
SURGERY AS A SCIENCE: THE INTELLECTUAL AND PRACTICAL EVOLUTION OF EUROPEAN SURGERY FROM THE 16TH TO THE 18TH CENTURY

MOLLY NEBIOLO, BUTLER UNIVERSITY
MENTOR: SCOTT SWANSON

Abstract

This article explores the transition of surgery from a collection of skills and techniques used on the battlefield to its acceptance as a medical profession. Opinion was shaped through advances in technology, use of anesthesia, and surgical practices. This success prompted a shift in public confidence facilitated by the Church’s funding of public autopsies led by surgeons. Once the public understood the greater effectiveness of surgeons, their status changed from butcher to doctor by the early 18th century. Previous research has focused on the technological advances behind the professionalization of surgery and the sociological change in beliefs, but this article will incorporate elements of both.

In the early 15th century, surgery was a skill performed by barbers in which limbs were hacked away or stitched together, a “last-case scenario” for survival, not a serious way to heal the sick. The Church believed surgery was a massacre of God’s gift: the body. The public and the Church also thought poorly of the practice because it frequently caused excruciating pain, high mortality rates, and left the patient un-whole. The beliefs of the public, the Church, and physicians changed as a higher rate of public autopsies helped improve knowledge of the body, universities began teaching surgery at a greater rate, and more books were published on the subject. By 1745, surgery had become a medical skill performed by physicians, as evidenced by a split between barbers and surgeons in London. The Company of Barber Surgeons in England and the other Barber-Surgeon guilds in Europe lost status and barbers took on the role with which we associate them today.

Most historians have focused on surgery’s technological advances in understanding its transformation from the removal of limbs to a respected
profession.\textsuperscript{1} With modern tools and better procedures, surgery became a safer and more reliable procedure. Tony Hunt and Roy Porter, historians of medieval surgery and medicine, discuss the limited scope of technology that was available to barber surgeons in the early 16th century.\textsuperscript{2} When a surgeon was on the battlefield sewing together limbs, there were restrictions as to what could be done with the handful of tools a surgeon could physically carry. Robert Krebs notes that the intellectual productivity of the Renaissance catalyzed new surgical techniques and tools.\textsuperscript{3} Although the modernization of tools were key to the transformation of surgery, it was not the only reason for surgery’s rise in respectability and professionalization.

This article will highlight a number of major technological innovations in surgery in the early modern period, but more importantly, it will explain why these technologies modernized and how they played a role in professionalizing surgery. Existing resources describing the advances in surgical tools and techniques either lack written descriptions of their uses or are beyond my ability to translate. I will answer the above-proposed questions to determine how the melding of technology, society, and culture transformed surgery.

Jesse Dobson and Robert Walker emphasize the rivalry between the Company of Barber Surgeons and the Company of Physicians that appeared in the last quarter of the 1400s.\textsuperscript{4} As barbers became more popular in medical society, physicians tried to maintain their societal prestige by eliminating

\begin{itemize}
\item \textsuperscript{1} Tony Hunt, \textit{The Medieval Surgery} (Suffolk, UK: Boydell, 1992).
\item C. J. S. Thompson, \textit{The History and Evolution of Surgical Instruments} (New York: Schuman, 1942).
\item \textsuperscript{2} Hunt, \textit{Medieval Surgery}.
\item \textsuperscript{3} Krebs, \textit{Groundbreaking Scientific Experiments}.
\end{itemize}
barbers’ right to practice certain types of medicine.⁵ Although historians have
looked at surgeons’ interactions with fellow healers in early modern Europe,
they have not investigated how and why surgeons rose in social rank over
time. To determine how surgery evolved into a profession, we must look at
the influences of multiple factions of society and how they individually and
collectively impacted the transformation of surgery.

This article will highlight the shift in public and church opinion towards
surgery and how modern tools affected these changes in opinion. Technology
cannot advance of its own accord, so this article will examine the reasons
leading to innovation and how study of the mysteries of the body played a
major role in these movements. An investigation into the culture behind
technological advances will help illustrate that it was neither inventions nor
culture alone that yielded an environment accepting of surgery as a line of
work.⁶ Like the famous chicken/egg conundrum, this article will attempt to
determine: “Which caused the professionalization of surgery: technology or
culture?” Previous research has stated distinctly that either culture change or
modernization of tools were at the apex of surgical professionalization, but
this paper will argue it was the intertwined relationship between
technological advancements and changes in culture that allowed for surgery
to progress into its modern professional, respectable form.⁷

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BUTLER JOURNAL OF UNDERGRADUATE RESEARCH, VOLUME 3

Growth in the field of surgery began as early as 1560 with increasing demand for surgeons prompting surgical courses to be taught at medical schools and surgical literature to be published at a rapid rate. The Annals of the Company of Barber Surgeons of London and the written documentation of the University of Bologna will be used to determine the extent to which surgery became a profession by the mid-18th century. Specifically, The Annals are the closest available primary documentation on the daily interactions of barber surgeons in society and their significance over time. The written curriculum of the University of Bologna from 1560-1590 enables us to see how medical education changed as surgery became more prevalent. The curriculum depicts how surgery became integrated into medical education. These texts will also be used to determine how surgery shifted from the College of Barbers to the Company of Surgeons in 1745. Until the dawn of the 19th century, there was little interest in preserving documentation on European surgery, so few primary documents survive to answer these questions.

Technological Innovations

The profession of a surgeon did not exist in the 16th century as it does today; surgery was instead considered a collection of skills known by a few men that could heal a person. The defining factor between the work of a physician and that of a barber surgeon, as surgeons were then called, was the placement of the wound or illness. A physician would handle anything that was happening on the surface of a body, while anything embedded or encased within the body would be treated by a man with the skills to remove the foreign object. Very few barber surgeons lived and worked solely as barber surgeons as surgery was not considered a complete profession, so barbers performed surgical tasks but were not specialized. Butchers were also sought out for surgical help because they were known to be practical with their

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8 Lines, “Reorganizing the Curriculum.”

9 Ibid.

10 Young, Annals of the Barber-surgeons.

11 Lindemann, Medicine and Society.

12 Hunt, Medieval Surgery.
hands, handling and cutting flesh as a profession.\textsuperscript{13} Because barber surgeons provided other uses that benefitted the town, there were few surgery-specific tools. If a part of the body needed to be opened, anything in the vicinity that got the job done would be used.\textsuperscript{14} The local expert on setting a broken leg or removing a kidney stone could also be the neighborhood butcher or craftsman. Surgery’s early identity as a skill rather than a profession is significant, as little attention was given it because only a limited number of men performed surgical tasks.

Besides the work done by the local barber in every village throughout Europe, it was on the battlefield that surgery was usually performed during the sixteenth and seventeenth centuries. When war broke out, an influx of new surgical tools and techniques to follow.\textsuperscript{15} Men were hired to help the wounded and the speed and agility needed to keep a patient alive caused basic worker’s tools to become surgical instruments.\textsuperscript{16} According to A General System of Surgery, gunshot wounds in the 1680s were, “so much by the heat of the bullets as by the Rapidity with which they destroy the Parts, and the violence of the Symptoms is owing chiefly to this matter of wounding.”\textsuperscript{17} The battlefield seemed to glorify those that performed surgery, and mark them out in society. Barber surgeons were known because of the gory, painful, and morbid stories told by survivors on the battlefield, and since this was where most surgeries occurred, it became a feared practice by the common man. No one wanted to deal with surgery unless necessary because surgical patients


\textsuperscript{14} Thompson, History and Evolution of Surgical Instruments.

\textsuperscript{15} Hunt, Medieval Surgery.


\textsuperscript{17} Lorenz Heister, A general system of surgery in three parts: Containing the doctrine and management. I. Of wounds, fractures, luxations, tumours, and ulcers, of all kinds. II. Of the several operations performed on all parts of the body. III. Of the several bandages applied in all operations and disorders. The whole illustrated with thirty eight copper-plates, exhibiting all the operations, instruments, bandages, and improvements, according to the modern and most approved practice : to which is prefixed an introduction concerning the nature, origin, progress, and improvements of surgery : with such other preliminaries as are necessary to be known by the younger surgeons. Being a work of thirty years experience (London: Printed for W. Innys at the West-End os St. Paul's, 1743), 51.
who were lucky enough to survive returned home with missing limbs, pain, scars, traumatic memories, and lengthy recoveries. The reputation of a barber surgeon was a grim one. The association between barber surgeons with war, pain, and loss of limb prevented the profession of surgery from progressing.

Although barber surgeons had a grim reputation on the battlefield, they were respected for being crafty and quick-thinking. Barber surgeons had to remember the rules of treating a gunshot wound, which included, “extracting all foreign Bodies, to stop the Heaemorrhage [sic], to promote Suppuration [pus formation], and to encourage new flesh.” Surgeons at the turn of the 16th century were efficient in using anything available as a tool of healing. While clever with tools, barber-surgeons also had to be cognizant of factors other than the wound. An arrow wound would require a surgeon to consider the type of arrow, its position and location, the composition of the arrowhead (if it is was poisoned), and the complications brought on by bleeding, dirt, and pebbles in the wound. In the fifteenth and early sixteenth centuries, staunching bleeding while attempting to extract a foreign object was the major conundrum.

In the early sixteenth century, it was anecdotes from witnesses that fed most animosity towards surgery. Barber surgeons were aware of their reputation and tried to hide their instruments and techniques from patients. One such instance can be seen in the creation of issues, or small ulcers in the body, to regulate the health of the patient:

“There is a second method of making Issues by wounding the Skin with a red-hot Iron or actual Cautery, which is usually in a sort of Capsula, or Case of Iron, to conceal it from terrifying the Patient.”

Making holes in patients’ skin to “heal them” is a terrifying proposition, but making those holes with red-hot irons could petrify even the bravest patient. Though the barber surgeon attempted to hide the terrifying truth from the patient, their reaction to the wounding was scarring enough for them or any witness.

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18 Ibid., 52.

19 Burns, “The Medieval Crossbow.”

20 Ibid., 988.

21 Heister, A general system of surgery, 314.
As barber surgeons were mainly needed during sudden war or fighting, it was not worth the time or effort to produce new tools when it was unclear when they would next be needed. Nor would it be profitable for a barber surgeon to test out new techniques if very few individuals would call on them for emergencies at home. Barber surgeons were the last resort and they had neither materials nor opportunities for improving their surgical craft.

The introduction of more menacing weapons in battle, like cannons and gunpowder in the mid-sixteenth century, that prompted barber surgeons to develop more efficient tools. Firearms ripped apart limbs, so scalpels gained handles to permit a barber to cut more easily for amputation.\(^{22}\) The speculum, invented by Guy de Chauliac, was upgraded in 1554 when a mirror was attached to it so a surgeon was better able to see if a wound was unsanitary or if a bullet was embedded deep within.\(^{23}\) This was a much more sterile way of inspecting a wound than prodding and extracting with fingers. Even minor adjustments made to tools allowed for more surgical efficiency and precision. As surgical procedures became more common and better techniques were in higher demand, newer tools were widely adopted, survival rates rose, and the public began to revisit their collective opinion of surgery.

Ambroise Paré was one of the first barber surgeons to modernize surgical tools and techniques.\(^{24}\) While he was working on the battlefield during a campaign in 1536, Paré realized how pointless current surgery was for men wounded by firearms. Surgeons, at a loss, would cut the throats of the wounded rather than attempt to heal them. In disgust, Paré sought ways address wounds caused by cannon.\(^{25}\) He successfully applied rose oil, egg whites, and turpentine on gunshot wounds which became one of his most widely used surgical techniques.\(^{26}\) The mixture dates to the Romans and the day after applying the concoction to a gunshot wound, the injured could sleep the night and their wounds were on the mend. In contrast, men who had boiling oil applied to their wounds, a previously common practice throughout

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\(^{22}\) Thompson, *History and Evolution of Surgical Instruments*, 24.

\(^{23}\) Ibid., 50.


\(^{25}\) Ibid., 198-202.

Europe, were feverish from a night of sleeplessness, pain, and swollen wounds. This new method of cleaning gunshot wounds was used widely after word spread on its success. Although he did not create many surgical innovations, Paré’s sympathy for the patient’s pain and determination that he could improve their conditions influenced other barber surgeons in the mid-sixteenth century to do the same.\footnote{Harold Ellis, \textit{The Cambridge Illustrated History of Surgery} (Cambridge, UK: Cambridge UP, 2009), 45.}

While improvement of tools in the wake of gunpowder and cannon grew more common during the latter half of the sixteenth century, the invention of and practice with better tools and techniques coursed through Europe during the sixteenth and seventeenth centuries.\footnote{Thompson, \textit{History and Evolution of Surgical Instruments}, 72.} At the peak of the Renaissance, advancements in culture encompassed art, transportation, sanitation, and surgery. The forceps, a tool used by surgeons to help pull out a baby during difficult childbirth or to pull out bullets and shrapnel, was invented by a barber surgeon during the late sixteenth century. By the seventeenth century, forceps became one of the key instruments in a surgeon’s toolkit. Barber surgeons didn’t document the tools they used regularly, but strong correlations exist between commonplace tools in other occupations and the innovations taking place with regard to tools. Wider varieties of a tool may indicate there was enough demand to support creating an array of styles. The minute tweaks that created dozens of different types of forceps and scalpels within several decades in the seventeenth century suggests there were enough barber surgeons, materials, and funding to test and create a wide array of tools.\footnote{Ibid., 72.} More improvements ensued as interest in surgery grew, fueled by a growing desire for knowledge during the Renaissance. This interest could not have materialized unless people began to think more highly of barber surgeons, their craft became imperative, or both.

Another central innovation in technology that led to the professionalization of surgery was the use of anesthesia. Wine and opiates were popular during the Greek and Roman times to render patients unconscious during painful surgeries, but throughout the fifteenth century and up to the beginning of the sixteenth, the use of opiates was rare because most surgeons were unable to gain access to such medicines.\footnote{McGrew and McGrew, \textit{Encyclopedia of Medical History}, 14.} Instead,
patients were lucky if they had enough wine to sedate them during a painful surgery. Roy Porter states, “Before the introduction of anesthesia in the 1840’s, invasive surgery was limited in scope; lengthy operations, or ones demanding great precision, were out of the question.”

Because modern anesthesia was not initiated until the nineteenth century, everyday surgery was limited to simple, small-scale and benign actions like dressing wounds, drawing teeth, lancing boils, trussing up ruptures and so forth. No one wanted to undergo surgery while conscious, making them unhappy and unwilling to be worked on. Their reputation for bringing pain meant that barber surgeons were not a welcome sight.

Restrictions on riskier and more invasive practices began to loosen at the beginning of the seventeenth century when ingredients other than alcohol to numb a patient became more available. Before the discovery of ether as an anesthetic, opium was widely used if a surgeon had access to it. During the sixteenth century, a soporific sponge was used as a more efficient anesthetic than wine or whiskey. Dipped in a mixture of opium, hyosayamine (a secondary metabolite found in certain plants that settles the stomach and GI tract), blackberries, lettuce seed, hemlock juice, mandragoria and ivy, the sponge was then dried in the sun until it needed to be used for a surgery, when the surgeon would soak it in water and apply to the patient’s nose. Other similar mixtures were used for inhalation or ingestion, however, the common ingredient between most mixtures was opium.

If any of the above ingredients were scarce, a surgeon would cut off blood circulation in the carotid artery to cause the patient to lose consciousness. This was an effective anesthetic, but how long the patient stayed under and damage cause by compression of the artery was difficult to control. During the eighteenth century, it was also possible to bleed the patient to cause them to faint.

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31 Porter, Blood and Guts, 80.
32 Ibid., 80.
34 Ibid., 14.
35 Ibid., 16.
36 Ibid., 15.
37 Ibid., 14.
expected during the procedure. This was not a successful method of sedation nor was it a pleasing sight for witnesses of the surgery.

Though successful anesthesia was introduced late in the eighteenth century, the previously mentioned methods of sedation, though brutal and uncontrollable, demonstrate the development of surgical skill. If there were enough barber surgeons to test and pass along successful methods for calming a patient and enough surgeries being done to verify techniques, then it can be deduced that surgery started to become accepted as a career during the sixteenth and seventeenth centuries. Sedation increased success for complicated surgeries since the surgeon did not have to worry about holding down a patient or consider their pain threshold. The influence of anesthesia on surgery can be seen in the journal of Timothy Clark, a student of physiology and surgery in 1670s when he discusses the clinical case of a man who lost his spleen after a suicide attempt:

“[After finding the body] the constables were horrified, and left the man for dead, as they believed. For three days, the wound remained without suture, but at last a surgeon was summoned. The surgeon replaced the intestines and cut away part of the omentum, along with the spleen. The man rapidly recovered from the effects of the wound and for the whole of the following year remained in good health and spirits.”\(^{38}\)

Earlier in the diary Clark mentioned the patient was put to sleep prior to the surgery. With the anesthetic, the surgery was a success and allowed the patient to survive a trip to New England to start a new life.\(^{39}\) This is one of many clinical cases of complicated surgeries that were possible due to the use of more modern anesthesia. The varied types of anesthetic that appeared during the sixteenth through eighteenth centuries demonstrate how surgical activity evolved from a necessary skill to a successful profession.

The progression of tools and techniques for barber surgeons also supports the assertion that surgery was developing into a widely accepted profession. As instruments evolved into more efficient and controllable tools and better techniques led to more successful recoveries, public opinion of surgery would change. The surviving documentation from this time period indicates that perceptions were beginning to shift. By the middle of the 1550s, there was a huge boom in the invention, and widespread use, of new

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\(^{38}\) Ellis, *Cambridge Illustrated History of Surgery*, 45.

\(^{39}\) Ibid., 45.
technologies and techniques that allowed for surgery to become more controllable and successful. With the rapidity of innovation, the modernization of tools cannot be considered merely as an expression of changing times, but as a continent-wide event in which the job of the barber surgeon was evolving into something more acceptable and necessary to society. However, it was not just the tools themselves that evolved, but the opinions and actions of people who stimulated the outgrowth of invention. As tools cannot develop and ideas cannot spread without people creating these ideas and tools, the modernization of surgical tools was not the only influence on the professionalization of surgery.

Changes in Public Opinion and Culture

Advances in surgical technology did not happen overnight, nor did they occur on their own. It was the people behind the inventions of new tools and techniques that fueled the evolution of surgery. Who were these people investing time and energy into modernizing surgery? Why was there a spike in innovation relating to instruments and styles of surgery? Something in society had to have changed to cause this gradual increase and investment in surgical procedures.

This section of this article will look at the different ways public opinion changed towards barber surgeons and their craft, promoting the relevance of surgery in early modern Europe. This section will examine how public opinion first opposed surgery, specifically the Church and the College of Physicians, and why this was so.\(^{40}\) Texts focusing on the intellectual advances of surgery will help explain the change in cultural opinion from the mid-sixteenth century until 1745, when surgery was widely accepted as a medical profession.\(^{41}\) This section will discuss how public opinion sparked changes in culture and technology that resulted in the evolution of surgery.

\(^{40}\) Dobson and Walker, *Barbers and Barber-surgeons of London*, 180.
Young, *Annals of the Barber-surgeons*.

\(^{41}\) Krebs, *Groundbreaking Scientific Experiments*.
Lines, “Reorganizing the Curriculum.”
Putnam, *Books and Their Makers*. 
Cultural change focuses on overall reactions of a culture or body in society. Changes in culture and the mutability of public opinion are two terms that have been used interchangeably, but this paper will look at each as a separate entity. This paper will demonstrate that surgery had become a necessary cultural component by the late seventeenth century. This includes the acceptance of surgery by medical schools, the boom in surgical publications, and the creation of anatomical theaters. The Company of Barber Surgeons and their interactions with the Company of physicians between 1500 and 1745 will explain how barber surgeons fit into European culture in the early modern period. The changing ideology of the Church (primarily clergy and the ruling bodies of the Christian faith) towards surgery was also significant.

The above aspects of culture and how their change from the sixteenth to the seventeenth century will show how over time surgery became a necessary and significant part of society and was permitted to become its own career. Although the differences between culture and public opinion seem very fine, this article will argue that the modification of public opinion sparked the alterations of culture and technology that allowed for surgery to become a profession.

By 1500, barber surgeons and their craft were perceived negatively throughout the continent. Physicians in northern Europe believed the barber surgeons were not true healers or active participants in the healing process, but rather consultants. Since many barber surgeons were not educated around 1500, their craft was thought of as healing, but at a menial level below what Europeans believed medicine to be. By 1660, when surgeons were becoming more and more educated, respect for barber surgeons spiked. In Paris, surgeons respected the fact that physicians dominated the medical field, but the general population of barber surgeons grew at a steady rate. In Germany, the opinion towards barber surgery did not improve at a noticeable rate through the nineteenth century because medicine did not advance as quickly as it did in France and England. To the Germans, barber surgeons had a more acceptable role in medical society by performing the hands-on medicine physicians did not care to use. In the southern

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43 Ibid., 30.
44 Ibid., 31.
Mediterranean, householders in Italy, Spain and France left barber-surgeons on the doorstep with other lowly vocations.\footnote{Ibid., 32.} Though in Salerno, the medical hub of Europe throughout the Middle Ages, physicians and surgeons were considered equals within the field of medicine and their education was not separated if they attended university.\footnote{Ibid., 32.} Given that Salerno was the first medical school, it is not surprising they were the first to follow through with the notion that surgery was indeed a medical skill that a man should attend school to learn.

Although there was an overall negative opinion towards surgery, the seventeenth and eighteenth centuries saw a fundamental change in public opinion towards surgery. Although the research focuses heavily on the seventeenth and eighteenth centuries, I believe the point of transition from a negative to a positive belief in surgical technique started early in the sixteenth century. Granted, there are not sources strongly supporting a change in opinion but a change in the heart of many individuals was necessary for the development of society that allowed for the professionalization of surgery and its development as a discipline.

The significant change in professional opinion towards surgeons is perhaps best exemplified by the inclusion of surgical courses in the medical school at the University of Bologna. Barber surgeons were rarely educated at universities, instead receiving training through apprenticeships and experience, as most medical universities were for physicians. Physicians did not look highly on surgery, nor did they believe it should be considered a part of the field of medicine. However, because of increased public acceptance of surgery and/or the introduction of anatomical theaters into medical study, the curriculum of medicine was beginning to shift. Particularly in the 1660s and 1670s when plague hit England and most of Europe, physicians took up experimentation with surgical techniques to better understand infection. Dr. Richard Mead of England wrote in his Discourses on the plague how he wanted to study how the plague and infection worked:

“[I want to investigate] What the effect the bile [of an infected human] would have had, when taken in the Stomach of a Dog: and likewise, what the Result would have been of Injecting into the Veins, other Juices of the body, besides the Bile, and also Matter flowing from the Pestilential Ulcers: For it cannot be certainly concluded, that the Bile
would have the same Effect, what ever [sic] Way conveyed into the Body...And perhaps, on the other hand, some other Juices of the Body besides the Bile, particularly the Matter of the Buboes or Carbuncles, injected into the Veins, might have given the Disease; as we see Infection is communicated by the Matter of the Pustules in the Experiment of Inoculating of the Small-Pox.\textsuperscript{48}

When Mead writes this, he is thinking both as a physician and a surgeon, wanting to inject human bile into a dog and study the composition of the dog’s stomach and other organs after it has been killed and dissected. Although Mead wanted to determine how infection acts upon the different humors of the body, a primary focus for physicians, the experiment is very surgical in nature. Testing the effect of fluids being introduced intravenously was normally a surgeon’s method, yet he wants to see the physical affects that the different fluids have on a dog to improve knowledge of a disease usually treated by a physician. This brief excerpt of his dedication in his \textit{Discourses} demonstrates the mindset of a physician during the early eighteenth century, from the perspective of a physician and a surgeon.

Even prior to the outbreak of plague in the 1600s, the University of Bologna was one of the first universities to add surgery to their medical curriculum. In 1560, discussion between professors at the university concluded that surgery should be introduced into courses, like theoretical medicine, since it was starting to show promise as an important technique in the medical and anatomical world. It soon became such a critical point of study that it was given an optional class of its own (like a modern elective). By 1573, a surgical course became the only course available for students in the mornings.\textsuperscript{49} By the end of the 1580s, surgery was a core requirement of the medical curriculum at the University.\textsuperscript{50} Even though this is just a snapshot of the changing curriculum at one university amongst dozens all over Europe, this Italian university (and many of the Italian medical curriculums were copied by those in Paris and England) clearly noticed the importance of surgery as a medical field. Physicians were the lecturers and heads of the medical schools, so adding surgery as a medical course meant that physicians’ opinions towards surgery had fundamentally changed in the

\textsuperscript{48} Richard Mead, \textit{A Short Discourse Concerning Pestilential Contagion, and the Methods to be used to Prevent it} (London: Printed for Sam Buckley, 1720), 10.

\textsuperscript{49} Lines, “Reorganizing the Curriculum,” 12.

\textsuperscript{50} Ibid., 14.
late 1500s. This is demonstrative of an overall shift in doctors' thoughts on surgery which ultimately led to an accepted position for surgery in the medical world of Europe by the early eighteenth century.

As the opinions of medical professions started to change, the public started to recognize and support the surgical profession. In Paris, King Louis XIV became a major patron of surgery in the seventeenth and early eighteenth century. In 1724, the personal success of popular surgeon Georges Mareschal at the Charite Hospital in Paris lead to a government grant that established the School of Surgery in Paris (L’ Ecole de Chirurgie).51 Similarly, when the medical school was established at the University of Edinburgh in 1724, it was one of the only universities to include surgery as a field of study, offering a degree in surgery. Mareschal received funds to create the Royal Society of Surgery in 1748.52 These examples illustrate how surgery gained enough funds from the government and the public to create their own societies and schools. This indicates that enough of the public had a positive opinion to recognize the importance of surgery and invest in it. This also means that surgery was becoming such a prestigious field that new rules and regulations made it formal education for surgeons necessary. When once it was not thought appropriate for barber surgeons to get a degree in their surgical craft, it was now thought poorly if they did not. This demonstrates that surgery, by the mid-seventeenth century, was finally an accepted medical profession in early modern European society.

The growth of published texts on the topic of surgery is another important indicator of changing public opinion. The presence of surgical books and pamphlets in society indicates there existed a learned and wealthy people who felt strongly enough about the topic to pay for a surgeon’s publication. Surgical texts did not start circulating in European society until the late sixteenth century as new research on the human body and surgical instruments emerged. By the early seventeenth century, when surgeons had to become more educated to be accepted into the Company of Barber Surgeons, books were one of the ways they could gain knowledge on which techniques and tools to use. However, these initial publications were full of inaccuracies. After the texts circulated for a time, further new ideas and findings prompted the publication of more books to provide valid information for the growing surgical population at the dawn of the eighteenth century. One introduction to a surgical text validates this:

51 Ellis, Cambridge Illustrated History of Surgery, 46.

52 Ibid., 46.
“If any one examines the best Books, such as the Microtechnia of Van Hoorn, the Operations of Nucke etc, which were at the time consulted not only by our Surgeons but also by our University Professors for teaching and learning the Art, it will readily appear how imperfect and insufficient they are...”

As the author of the General System of Surgery mentions, there are previous authors on the topic of surgery, but now that there have been more advances in the field, he has the resources and obligation to write a more contemporary work on surgery. In another text, the basics of surgery and the anatomy of the body are provided. For example, the definition of a nerve:

“They are the Organs of Sence [sic], long, round, white Bodies, covered with two Membranes, made of the Dura and the Pia Mater, composed of Fibres. Springing from the Cortical part of the Brain and the Cerebellum”

With surgical texts being published that show the basics of surgical skill and the definition of major components of the body, by the dawn of the eighteenth century (with this particular text published in 1705), surgery had a wide enough audience to allow learned texts written by educated and successful surgeons to circulate throughout Europe.

The culture of surgical texts is important because the more interest people had in the field, the more likely there were patrons to invest in publishing textbooks. As George Putnam states: “The 15th century rediscovered (books of the) antiquity, the 16th century was absorbed in slowly deciphering it.” While learned scholars and monks were spending time deciphering Greek and Roman texts, it took nearly another two centuries for the surgical texts to appear. With new tools and new techniques circulating and surgical skills starting to be highly prized thanks to the popularity of anatomy and anatomical theaters, interest in surgery grew. Most of the texts from this era were published from 1675 onward. The significance of this

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53 Heister, A general system of surgery, vii.

54 James Handley, Colloquia Chirurgica; or, the whole Art of Surgery epitomiz’d and made easie according to modern practice. ... To which is added a compendium of Anatomy (London: Printed for A. Bettesworth, 1705), 174.

55 Putnam, Books and Their Makers, 105.

56 This is from my experience in looking up primary resources. It is hard to say if it is factually true that the surgical texts that do remain are mostly from the late 1600’s into the 1700’s.
observation is twofold. First, the field of surgery was significant enough that people thought it profitable and worthwhile to publish solely on the topic. Second, there was enough monetary investment in the publication of these books that multiple editions could be released (*A general system of surgery* by Lorenz Heister, cited in this article, is a third edition of the original text).

In the fourteenth and fifteenth centuries, physicians were the predominant specialists in the medical field.\(^57\) Although there were a large number of uneducated healers in European society, these healers and the educated physicians had one thing in common: they tried to heal a patient using their mind and knowledge instead of their hands. As Roy Porter states, “The superior physician plumed himself as being marked out by mind, not muscle, brains not brawn.”\(^58\) For physicians, they counted in book-learning, experience, knowledge, memory and judgment. The common surgeon was depicted as a man of flesh—bold and beefy, holding a knife and a saw, no better than a butcher or a barber.\(^59\) That is why many barber surgeons held many trades like hair-cutting, butchery, and used their hands for other useful jobs. The Hippocratic Oath itself directed physicians to leave knife-work to surgeons. While this recognized the skills of the surgeon, it bred a division of labor that endured for centuries—surgery was inferior because it was the work of the hand, not of the head.\(^60\) It was because of this mindset that surgery was an inferior skill to physician’s work that kept surgery at the level of a barbaric skill rather than an esteemed profession.

The Church also had influence over the social standing of surgery in late medieval culture, and this played a significant role in surgery’s perceived unacceptability. To those of Christian faith, the body was pregnant with symbolic meanings. Since it was originally made in God’s image, it was a sacred temple that held the mysteries of the Holy Spirit.\(^61\) To gouge out limbs and hack away at the flesh and blood of God was thought to be an un-Christian thing to do. During the Renaissance, curiosity about the world around us—and seeing how it worked—became accepted and esteemed. It was during the Renaissance that many Christian churches wanted to unfold


\(^{58}\) Ibid., 30.

\(^{59}\) Ibid., 30.

\(^{60}\) Ibid., 78.

\(^{61}\) Ibid., 41.
the secrets of the body, and find out where the soul was located in man.\textsuperscript{62} Large artistic projects, like the paintings in the Vatican done by Michelangelo and other artists, focused on perfecting the art of painting the human body. Churches funded the construction of anatomical theaters where routine dissections were held and eager onlookers were able to sit and watch as barber surgeons, who were hired for the job of dissecting the cadavers, unraveled the mysteries of the human body.\textsuperscript{63} The introduction of anatomical theaters meant that barber surgeons were needed for their surgical skills to fulfill societal demand. This was the first time barber surgeons were building a positive reputation for their work as surgeons as they were recognized by learned society as men who were not just skilled with their hands, but with their knowledge.

Anatomical theaters also provided barber surgeons with the chance to show onlookers the importance of their work. If someone watching a dissection was interested in finding out more about a certain part of the body, they could become a patron of a barber surgeon. However, this was not as significant as the presence of wealthy and knowledgeable physicians who wanted to do more with their work. What emerged was a group called anatomists, who focused solely on specific parts of the body. For example, Andreas Vesalius became a world-renowned anatomist in the 1540s because he was able to study the human body and determine that the works of Galen, an ancient physician whose writings were the cornerstone to medical education for centuries, was based on animal anatomy and not the anatomy of the human body.\textsuperscript{64} Vesalius and many of his followers went on to discover how the circulatory system worked, where the organs lay in the body, what their purposes were, and many other important developments. The advances of anatomical research were key to the success of barber surgeons because the new knowledge allowed for society to understand the importance of the inner workings of the body and introduced new ways to better treat patients. If surgeons know what organ lies where and how it is important to the internal system of the body, then they can better diagnose and fix an ailing patient. Knowing where the major arteries and veins are allows for better prevention of accidentally cutting a patient in the wrong spot. A good

example of the importance of this knowledge can be seen in the anecdotes of Ambroise Paré:

“A sergeant of the Chatelet got a sword thrust in the throat.... It cut the external jugular vein completely across. As soon as he was injured he put a handkerchief on the wound and came to my house to find me. When he removed the handkerchief blood flowed very freely. I immediately tied the vein towards its root; thus it was staunched and he recovered, thanks to God. If you had followed your method of staunching the blood with cauteries (burning the vein to stop bleeding—the “old” way to staunch blood), I wonder if he would have recovered. I believe he would have died in the hands of the operator.”

Thanks to the growing knowledge of human anatomy, Paré could save his patient by recognizing the vein that was cut by the sword and tying the vein instead of burning it to save his patient. This method spread throughout Europe, soon replacing the once-common technique of cauterizing arteries.

While the acceptance and place of barber surgeons in the sixteenth and seventeenth centuries likely differed amongst European countries, this paper will focus specifically on the role of barber surgeons in English society to illustrate how surgery became its own profession. Not only was the Company of Barber Surgeons in London one of the largest such companies in Europe, their interactions with the Company of Physicians and the public over the centuries were carefully documented and republished. Their Annals can be used to generalize the relationship between barber surgeons and physicians during each century leading up to the separation and legalization of the Company of Surgeons in 1745. This year was pivotal because it marked the first time surgeons, in their own right, had a place in both society and medical culture: the first real example of the professionalization of surgery.

If a group of men had the same job in a large town during the fourteenth and fifteenth centuries, they usually formed a guild, or company, to monopolize the profession and regulate others in the career. In London, the Company of Barber Surgeons was recognized when its first Master, Richard le Barber, was sworn into his position in 1308. In 1451, the Company of

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66 Ibid., 36.


68 Ibid., 51.
Barbers was given the Grant of Arms to undertake surgery as a craft within their guild.\textsuperscript{69} Prior to 1451, any man could lawfully conduct surgeries because it was not a skill monitored under any particular company, but after 1451, any legitimate surgery had to be done by a sworn barber surgeon belonging to the Company of Barbers.

The barber surgeons were able to thrive because they had a number of skills in addition to their surgical set, so citizens were not repulsed by a man whose sole career involved cutting open a man—a barber surgeon was able to provide haircuts and pull teeth.\textsuperscript{70} As Sydney Young wrote:

“\textit{The Barbers by the regular and everyday nature of their calling as shavers and haircutters, together with the practice of surgery combined by so many of them, were the most likely to become the more popular Company; their fees would surely be on a lower scale than those of the more aristocratic surgeons and their number and constant intercourse with the citizens, in their capacity as barbers, enabled them easily to extend their connection as surgeons.}”\textsuperscript{71} Barber surgeons flourished in London during the first half of the sixteenth century. During this time, most of the men in the Company of Barbers had little to no formal education in medical practices. It wasn’t until 1540 that the Company of Physicians took notice of these men. Even as early as 1525 and throughout the latter half of the sixteenth century, the Company of Physicians tried to uphold divisions over who within medical society could learn and practice certain types of “physic” (or medicine).\textsuperscript{72}

The growth of the Company of Barber Surgeons indicates interest in the art of surgery, demand for surgeons in London, and increased notice from physicians. With an increased presence in society because of their role in anatomy, barber surgeons were perceived as a threat to the physicians, despite physicians maintaining that there were distinct differences between medicine and surgery. The middle of the sixteenth century also marked the beginning of most of the major inventions and modernizations to surgical tools and techniques, which meant more patients were comfortable with having surgery done and more men could test out new inventions as part of a

\textsuperscript{69} Ibid., 51.

\textsuperscript{70} Ibid., 51.

\textsuperscript{71} Ibid., 51.

\textsuperscript{72} Ibid., 125.
larger population within the Company. As more men joined the Company of Barber Surgeons from across England, they could spread their own techniques and ideas more successfully. Either way, there was an increasing demand for surgery that permitted growth within the Company and the techniques they used. Demand for men with these skills ultimately led to the professionalization of surgery by 1745.

Throughout the latter half of the sixteenth century, a number of events reveal the growing importance of surgery in society. The most widely seen indicators were the growing amounts of money demanded from the Company of Barber Surgeons by the royal family and city of London, as well as the placement of barber surgeons in court. In 1525, Henry VIII placed Thomas Vicary as Surgeon to the King to try to help treat the King’s ulcerous leg. During the reign of Elizabeth I, a royal surgeon was kept to help with the Queen’s ailing teeth in the 1580s and, in 1599, the royal household of Scotland recognized the Faculty of Physicians and Surgeons in Glasgow.73 The hiring of surgeons by the upper class was an important step toward the professionalization of the field. In the annals of the Company of Barber Surgeons, common minutes on the financial demands of the city are as follows:

“29th March 1596. It was ordered that £40 ‘ship money’ should be ‘lent’ by the Company to the City which is the earliest mention of this obnoxious tax in our books.”74

It can be seen from this notation that the barber surgeons knew, given the quotation marks around the word “lent” that the city was not going to return the forty pounds that was given to them. The Company must have had enough money to be able to afford this “loan,” or at least had access to people who could dispense the tax. The last part of this note may suggest that the barber surgeons were sick of the taxes put upon their company or they were tired of having to lend out money that was not returned. The fact that the Company could still stay afloat for centuries while the city and the royal court are taking out so many loans shows that the Company of Barber Surgeons was prosperous enough to manage such expenditures. They must have had enough members providing adequate revenue or had ties to wealthy members/patrons. This access to substantial funds to give away to court

73 Ellis, Cambridge Illustrated History of Surgery, 36.

74 Young, Annals of the Barber-surgeons, 107.
exemplifies that the Company was enough in demand to sustain profits and connections.

While it may seem strange that higher taxes and demands for money are correlated with the rising significance of the Society, but it indicates higher expectations of the Company on the part of the royal family. If more men were becoming barber surgeons and joining the Company then there was more money flowing into the guild that could be lent to the royal family and government. If the court was relying on barber surgeons for money, the guild must have had a reputation of having stable enough finances to lend out funds. While the Company could have been demanding extra money from its members for these loans, ultimately leading to bankruptcy (though this did happen in the seventeenth century), at the end of the sixteenth century there were enough existing and new members to keep the Company afloat. If this hadn’t been true, the Company would have gone bankrupt sooner and they would have been unable to build the anatomical theater they constructed in 1636 for the advancement of surgery. The fact that the anatomical theater itself was built on the funds of the Company of Barber Surgeons shows the prosperity of its members. Without rapid membership growth, it would have been impossible to afford. To have the funds to build the theater, the culture of London must have changed substantially by 1636 from one that looked down on surgeons to one that needed them. Thus, surgery was becoming an acceptable medical profession, rather than the skill it once was in 1500.

With their newly created anatomical theater and the growing attention paid to barber surgeons by the court, the Company of Physicians recognized the threat of surgeons to their profession. By 1677, the Company of Physicians submitted a charter trying to gain power over the Company of Barber Surgeons. Alarmed and determined to keep the divide between the work of physic (medicine) and the work of surgery, the barber surgeons petitioned the court to keep their freedom. To the dismay of the Company of Physicians, the barber surgeons won the petition. However, from 1677 until 1745, the Company of Physicians kept trying to gain the power to oversee surgery. By 1677, with the skill of surgery taught in major medical schools across Europe, physicians were constantly aware of the growing influence of surgery inside and outside the medical sphere. This continued effort to keep influence in medical society shows that surgeons were gaining ground as competitors to physicians in the medical field.

At the end of the seventeenth century there was a noticeable divide in the Company of Barber Surgeon between the barbers and medically trained surgeons coming out of universities. Rules were passed in the Company to
keep an even distribution of barbers and surgeons in the seats of power within the guild. Of the four ruling “masters” in the Company, two had to be barbers and two had to be surgeons. This rule demonstrates a rise in friction between barbers and surgeons, since a formal law was needed to keep an even distribution in power, and illustrates there was a large enough population of barber surgeons who solely worked as surgeons to be able to demand such a law. Written in the annals of the Company is a note that goes more in depth on the struggles between the barbers and the surgeons of the Company:

“Jealousies arose in the Company in consequence of the more frequent election of Surgeons than Barbers, as Governors. The By-Laws required that every year there should be two Barbers and two Surgeons chosen (a Barber being defined as any member who did not practice Surgery). The Surgeons disregarded the law and the old custom, seem to have been able to procure the election of an undue number of members of their own craft to the offices of Master and Wardens...This altercation between the Barbers and the Surgeons was never forgotten, and indeed, helped to pave the way to further estrangement and the absolute separation in 1745 [this last sentence provided by Young himself].”

This quote shows how the barbers and surgeons were growing apart. The writer even notes the difference between a barber and a surgeon, stating a barber did not practice surgery. This parenthetical notation also exemplifies that at the end of the seventeenth century, when this note was written, the surgeons had created successful professions as just surgeons in the city of London. As Young mentions in the last sentence, the barbers and the surgeons were unable to move beyond this, increasing division between the two groups. The surgeons gained more power and influence in the company (because they were gaining more seats) indicating an increase of societal influence as surgeons were considered part of the medical profession.

In 1686, a formal proposal was sent on behalf of the surgeons to the king petitioning him to allow their separation from the barbers. This declaration is important for two reasons: the surgeons were strong enough to try and claim independence from the barbers and there were enough of them in London to create such a petition. Obviously, their demand for independence demonstrates how surgeons were now trying to establish their own profession. The king did not accept their petition, but they kept trying to gain

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75 Young, Annals of the Barber-surgeons, 149.
independence throughout the early eighteenth century while their influence as a majority of the governing body in the Company of Barber Surgeons kept growing. Finally, in 1745, the Company of Surgeons was established while the Company of Barbers, crippled with debt from loaning most of their money to the crown—were designated as strictly hair cutters.\textsuperscript{76} By 1745, surgery was a strong enough skillset that men were able to get educated on the subject and practice it as a formal profession as part of a trade guild.

The history of the London Company of Barber Surgeons is important to the professionalization of surgery. The power dynamics between the Company of Physicians and the Company of Barber Surgeons and the internal struggles between barbers and surgeons by the end of the seventeenth century also occurred in many major cities all over Europe. The \textit{Annals} of the London Company were easier to access and transcribe, but the split of the Company of Surgeons from the barber surgeons created a ripple effect across Europe. Once the surgeons were established in London, others in Spain, Paris, and various provinces in Italy took similar action and instated their own guilds.\textsuperscript{77}

\section*{Conclusion}

The opinion of the public and the individual directs culture, sparking the professionalization of surgery during the early modern era. If an individual or group of individuals had not noticed the importance of surgery, then culture would not have changed to accept surgery as a necessary part of society and better tools and methods would not have developed. However, the innovation of technology and the change in culture are pivotal to the evolution of surgery from a set of skills into an accepted medical profession. This article establishes how each was necessary to facilitate a drastic transition from the practice of surgery during the turn of the sixteenth century and its practice when the London Company of Surgeons broke away from the Company of Barbers in 1745.

Although this article briefly looks at only a few of the major players with a role in this evolution, its purpose has been to explain how and why the modernization of surgery occurred in the first place and why it happened when it did. It is important to look back at the creation of different

\textsuperscript{76} Ibid., 154-155.

\textsuperscript{77} Ibid., xi.
professions to appreciate and acknowledge the way they fit into modern society. With contemporary surgery a competitive and respected profession in the world of medicine, it is helpful to see how ideas and technologies have evolved to allow for such a profession to grow into its modern form. It is also interesting to see how the interactions between surgeons and physicians played out in the past, causing them to stay two separate careers instead one professional doing both roles. These historical patterns may still be happening now, resulting in the creation of a whole new job or profession that may gain significance in the future. Similar results have occurred for computer professionals and social media advisors with rapid advances in technology and societal opinion. By looking at the reasons careers and professions are created, observers and historians can recognize the significance each has in the context of culture, society, and the world around us.

Future research may identify further documentation to support the conclusions in this article and whether the experiences of the London Company of Barber Surgeons can be generalized across Europe. While the precise evolution of surgery and its professionalization may be unclear in parts, we can better understand the various societal influences that brought forth one of the most essential professions in the medical world.

Conclusion


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PROBLEMATIZING EUROPE’S BORDERS IN THE CONTEXT OF THE RECENT REFUGEE CRISIS

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Abstract

The fundamental problem of Europe’s borders is how a bounded social reality is to be organized, primarily meaning who is to be included and who is to be excluded. The present refugee crisis has only served to expose and intensify this raison d’être of borders as exclusionary mechanisms which carry great political, economic, and symbolic weight, frequently much to the detriment of those excluded by them. Primarily drawing from the international political sociological work of Didier Bigo and affiliated scholars, I present a theoretical paper coupled with relevant empirical examples to present a critique of the exclusionary modes of operation of Europe’s borders and the techniques that enable them. Exploring the constitution of Europe’s borders as technologically-enabled to decouple from the conventional spatial groundings of borders, I analyze the relationality between the logics, objectives and functions of Europe’s borders in relation to the dominant discursive framing of refugees and migrants in the context of the recent migrant crisis in Europe. I hold that this tragic event has not suddenly created new problems for Europe’s borders, immigration, and asylum systems, but simply exposed the multiple failures of the control and management practices inbuilt in the EU’s border regime.

Introduction

The problems of Europe’s borders are relative to the lived experience that heavily determines one’s relation to them. The desired configuration, operation, and objectives of the border are dependent on the spatial and cultural position of the actor who engages with them. Borders, while now again proliferating in their significance, have always been an important organizer of interstate and intrastate social reality (Delany, 2006: 183). The fundamental
problem that concerns borders, and not just those of Europe,¹ is that various individuals and groups hold a diverse spectrum of views on how a given bounded societal reality is to be organized, primarily regarding who is to be included and who is to be excluded (Newman, 2003: 14). The present refugee crisis has only served to expose and intensify this raison d’être of borders as exclusionary mechanisms which carry great political, economic, and symbolic weight, frequently to the detriment of those excluded by them. In this article I present a critique of the exclusionary modes of operation of Europe’s borders and the techniques that enable them.

My analysis draws on a range of literature including critical migration and security studies (De Genova, 2002; Delanty, 2006; Newman, 2003; O’Dowd, 2002; Rumford, 2006, 2007; Walters, 2002), surveillance studies (Ajana, 2012; Fuchs, 2013; Gandy, 2012; Jenkins, 2012) and, most prominently, the international political sociological research of Didier Bigo and affiliated scholars (Bigo, 2001; 2002; 2005; 2008; Bigo & Guild, 2005a; 2005b; Ceyhan, 2005; Ceyhan & Tsoukala, 2002; Tsoukala, 2005).

I assert that the arrangement of Europe’s collective societal reality is based upon the contested, multi-sited construction of fear, anxiety, and prejudice. This social and geographical anxiety, heavily orchestrated by an overarching “governmentality of unease,” feeds into the guiding security framework of the bordering practices of the European Union (EU) and its member states (Bigo & Guild, 2005a: 4). A series of noxious discourses propagated by “managers of unease,” media outlets, and the general public all underpin the logic of the EU’s border regime that construct the migrant as a source of risk along socio-economic, securitarian, and identity axes. It is these discourses that contribute to the formation of the legitimizing framework for the exclusionary practices of the EU. The tragic events of the current refugee crisis have not suddenly created new problems for Europe’s borders, immigration, and asylum systems, but simply exposed the multiple failures of the control and management practices inbuilt in the EU’s border regime.

The structure of this paper includes three main sections, the first of which introduces the complexity of Europe’s border in a digital age, examining the ‘ferromagnetic’ property of Europe’s border regime. In the second section I examine the range of discourses that contribute to the securitization of the migrant along the basis of three principles; socio-economic, securitarian,
and identity. In the third section I demonstrate the problematic functioning of Europe’s border regime, roughly demarcated across technical and social-cultural lines. The paper concludes with a summary of key findings.

**Understanding the Borders of Europe**

In an age of “liquid modernity” (Bauman 2000), the borders of Europe are no longer simple physical demarcations of territory. Instead, they liquefy and stretch inside and beyond the conventional perimeter of a state’s territory. Borders function across multiple axes (cultural, political, and economic) and fluctuate in thickness and visibility in accordance to the positionality of the those engaging with them (Paasi 2009). The borders of Europe are somewhat paradoxical entities, for some they are becoming ever more permeable and invisible, facilitating the neoliberal desire for fluidity in the circulation of capital, services, and people, but for others they have proliferated in number and location, acting as thicker, harder limits on movement, citizenship claims, and access to other internally-bounded societal realties (Delanty, 2006: 189-90). The globalizing “demise of territoriality” is accompanied with redoubled efforts by the state and its intelligence, security, and military aparatuses to strengthen the border while retaining the flexibility beget by globalizing forces (Walters, 2002: 561-2). Such is the extent of the diffusion of borders, decoupled from traditional understandings of spatiality, that they now come to subsume and function across entire countries (Rumford, 2006: 156). Benefit agencies, for instance, now serve additionally as immigration-status checkpoints, supplementing a regime of border control that extends beyond and below the traditional border (Ceyhan & Tsoukala, 2002: 35).

The key structural factor in managing the flows of movement is the technologies of surveillance which permit identification (biometrics, data collection), sorting, and, eventually, exclusion on the basis of perceived desirability (Bigo, 2005: 49). These databases of identifying information gathered through various surveillance appaetuates are increasingly networked together, allowing data to flow liberally and invisibly between governmental agencies, bodies, and even private companies to further the precision and efficient filtration of individuals deemed as too “risky” for inclusion (Bigo, 2005: 88). The increasingly porous border of the EU has entailed a greater emphasis placed on wide assemblages of surveillance systems and biometric technologies to ensure the future security of society and the state by acting in the present (Bigo, 2005: 70, 89). Through the ban-opticon, technologies of surveillance at the spatially diffuse border are rendered productive through the
execution of a pre-emptive logic of exclusion which rests upon “upon the construction of profiles that frame who is “abnormal,” and upon... [the] normalization of social groups whose behaviors are monitored for their present and their future” (Bigo & Tsoukala, 2008: 2). Defining the identity of individuals, sorting them into desirable and undesirable subjects, and subsequently erecting impediments on movement and restrictions on entry, either prior to the travel of the migrant or after crossing, characterizes Europe’s omnipresent ‘ferromagnetic shape-memory’ border. The constitution of the border, its effects, location, and interaction with individuals completely differ dependent on these categories. It is the management of people, the constitutive components to social reality, that have become the guiding objective of borders, not territory (Bigo, 2001: 111).

The uncoupling of the exclusionary functions of the border to a fixed spatiality is best understood through the operation of the Schengen area. The freedom of some is maintained through the exclusion of others (Bigo & Guild, 2005a: 3). The functioning of the Schengen area requires the presence of surveillance, classification and exclusionary mechanisms to identify and (pre-emptively) remove those who are perceived as threats to the EU, be it socially or economically, for the benefit of non-risky peoples who are essentially unencumbered by the very same borders. As such, given the variability of Europe’s borders, the popular claim of a “Fortress Europe” appear misleading. Instead, Europe’s borders are “ferromagnetic.” Through the operation of the networked surveillant assemblage, the scope and tightness of which is relationality dependent on the “magnetic” triggers of undesirability that are tripped and who tripped them (Rumford, 2007: 331). These modular, dynamic borders are diffused throughout society, interconnected between various administrative, intelligence, and private entities, and manage human mobility with a nuance not possible with the static, hard borders of old (Rumford, 2007: 331). In addition to being spatially transient, the borders of Europe are also temporally fluid, periodically dissolving and resolidifying in response to a given socioeconomic or political context (Rumford, 2007: 331; Guild, et al., 2015: 5). The refugee crisis is one such pertinent example of the resolidification of Europe’s borders. This hardening does not occur in isolation to other events, of course, but is significantly shaped by the popular rhetoric and discourses of political and securitarian expertise, discursive frames that speak through the language of fear, threat and securitization. If we indeed understand borders as facilitators of an idealized social reality, the strengthening of borders can only be understood in relation to a threat to this normative reality. I suggest that it is primarily through performative discourse that the identities of mi-
grants and refugees are constructed as sources of risk and thus are liable to be excluded through the ferromagnetic borders of Europe (Bigo, 2002: 63).

The Construction of the Migrant as Enemy

Through the dispositif of the ban-opticon surveillance techniques profile and categorize migratory flows on the basis of “desirability.” The exchange of fears and beliefs between a “transnational field of professionals in the management of unease” including politicians, the military, police and border forces, private security corporations, as well as the (sensationalist) media, formulate a climate of fear and risk though which contemporary bordering practices are made intelligible and legitimate (Bigo, 2002: 63-4).

Tsoukala identifies three primary axes that construct the migrant as an enemy:

1) The socio-economic principle heavily associates immigration as contributing to unemployment, economic decline, strains on national resources such as housing, health care and education, perceived as welfare cheats, and as causing urban and social deterioration (2005: 163).

2) The securitarian principle connects a range of security issues with immigration, from petty delinquency to organized crime (particularly drug trafficking [Derrida, 1995]), and, most pertinently, fundamentalist extremism and terrorism (Tsoukala, 2005: 163).


These three interrelated principles underpin a “discourse of fear” which heightens the existential anxieties of European “identity, security and well-being.” (Ceyhan & Tsoukala, 2002: 22, 21)

The November 2015 Paris attacks, Charlie Hebdo shooting, and other recent incidents have further inflamed sentiments conducive to this discourse of fear (Guild, et al., 2015: 13). As Europe’s border become more porous, the “traditional certainty of boundaries” is eroded and the identity of the existential, external threat has merged with the internal (Bigo, 2002: 76). The Möbius ribbon of (in)security has entailed, under the logic of risk avoidance, the stereotyping of those who can be considered a source of unease. As such, both internal and external (in)securities are increasingly attributed to the “enemy within,” the ontological actuality of which is projected onto the crim-
inogenic migrant who traverses the Möbius ribbon (Bigo, 2001: 112). Of course, given the heterogeneity of the societies of the EU’s member states, the exact discursive representation applied to migratory flows will differ in each country. Generally speaking, France, for example, constructs the “migrant image as that of a religious fanatic,” in Germany the image is of “a revolutionary and deviant,” and in the United Kingdom it depicts migrants as “rioters” with no “decent social behavior.” (Bigo, 2002: 70). I take note here to highlight the generalizations of these rhetorics as well as their liability to change in accordance with recent global and local developments.

These discourses of fear contribute to the securitization of migration through the privileging of certain criminogenic factors, most of which are based heavily on appearance and nationality (Ceyhan & Tsoukala, 2002: 28). The multifaceted threat posed by migratory flows simultaneously demands and legitimizes practices of profiling, risk analysis, statistical discrimination, categorization, and pre-emptive action (Bigo, 2002: 65-6). It is through these functions that the ferromagnetic borders are able to ensnare those defined as a source of risk. This is done using information gathered through programs such as, among others, Echelon and EUROSUR (Bigo, 2002: 75), as well as various private companies and software providers, couching the contentious, racial politics of Europe’s bordering practices under a logic of existential urgency and the authority of the statistic (Bigo, 2005: 89, 2008: 12).

The Borders of Europe and the Refugee Crisis

THE TECHNICAL DIMENSION

The mechanisms of border control, regardless of the spatiality or temporality, imbue an objective of filtering between the desirable and undesirable (Ceyhan & Tsoukala, 2002: 31). Functioning under the appearance of a neutral and objective system, the lived-experience and context of individuals is frequently silenced by the legitimate statistical discrimination of politically-defined “criminogenic” factors of nationality, religion, appearance, wealth, and documentation status (Ceyhan & Tsoukala, 2002: 25). The refugee crisis highlights the importance of considering the varied, rich individual stories and experiences of migratory flows carry prior to systematically and automatically categorizing large groups of people on the basis of quantifiable data only. Far from compassion, the function of the border, as seen through the dispositif of the ban-opticon, attempts to master an impending and inevitable “chaotic future” through a litany of technologies of surveillance and manage-
ment techniques (Bigo, 2002: 82). The inadequacy of this system, as so painfully demonstrated by the refugee crisis, demonstrates another crucial foundational problem of the functioning of Europe’s borders: The absolute control of borders, especially in an age of increasing porosity, is impossible for a neoliberal regime to achieve (Bigo, 2005: 49). The pursuit of the impossible only serves to perpetuate the political misery of the destitute (Ceyhan, 2005: 217). This “will to mastery” (Bigo, 2002: 70) of populations, security, and freedom that drives the judgement professionals of security and of politics only serves to nourish discourses of fear and myths of national homogeneity. The inefficiency and impossibility of this objective, even with advanced surveillance technologies, paradoxically, perpetuates the functioning of this governmentality and its related dispositifs, rationalities, and technologies. Similar to how Foucault argues “devices intended to produce freedom...risk producing exactly the opposite” (2008: 69), the European regime of border security intends to produce security but only achieves the reproduction of unease. With the advent of ferromagnetic borders came the implicit acknowledgement that traditional borders were in sufficient in stopping unwanted migratory flows (Broeders, 2007: 72).

The ubiquitous, diffuse ferromagnetic borderlands and the spatially-fixed borders of a state’s perimeter function simultaneously and cooperatively out of a secret necessity (Rumford, 2006: 156; Bigo, 2005: 50). While the hard, visible borders of the EU are nodes of visible security and practical regulatory controls, their ability to satisfactorily prevent the movement of “undesirable migratory” flows has greatly diminished (Bigo, 2002: 65-7). The porosity of Europe’s borders presents a Möbius ribbon of perceiving (in)security. The framing of desire for increased international flows, freedom and cooperation is counterbalanced by contradictory demands for control, management, and exclusion depending on the perception of the observer and the particular flow in question (Bigo, 2005: 53; Marin, 2011: 132). These practices of control, management, and exclusion are partial contributors to the “crisis” that the borders of Europe are currently experiencing due to their “technological-deterministic belief that crime and terrorism” can be prevented through the implementation of technology, rather than policy modification or a shift in public discourse (Gandy, 2012: 126; Jenkins, 2012: 160; Fuchs, 2013: 1329).

The intensification of Europe’s borders through EUROSUR and various Frontex operations has not served to seal the borders, rather, as the refugee crisis has shown, it has simply led to the increase in criminalization of migratory flows resorting to increasingly dangerous alternative routes of entry (Spijkerboer 2007, Human Rights Watch 2015). The internal disagreements
between member states on the appropriate distribution of refugees admitted or smuggled into Europe demonstrates a typical predicament for the EU as a whole. National interests structure the behavior of states to such an extent that unanimous solutions are rendered difficult, if not impossible, to implement (Gross, 2015: 2). The present refugee crisis has exposed the internal tensions of Europe’s regime to the world, so great are these strains that Gross asserts that “the present system is broke[n].” (2015: 2) The refugee crisis has spectacularly demonstrated that even these “new digital borders” cannot accomplish this task and that it is perhaps a change in mentalité that must occur instead of compounding faith in ever-more invasive digitizing, quantifying, and surveilling technologies.

Any proclamation of “failure” with regards to Europe’s borders, however, ignores the vast political capital that such an event can yield for specific actors, agencies, and bureaucracies. The functional logic of risk installed in Europe’s borders through a governmentality of unease that is enacted by a transnational field of experts can be seem as exemplified perfectly through the fear that the refugee crisis has sparked amongst the people of Europe. Migration has become a political technology to reaffirm cultural and political beliefs and the role of these managers of unease as providers of security and cultivators of political society (Bigo, 2002: 64). The reaction of a number of Schengen members to resurrect hard internal borders (Guild, et al. 2015), albeit temporarily, visibly reifies the negative formulation of migrants as dangerous and ultimately, unpredictable sources of future risk. This culture of fear further serves as an opportunity for security professionals to publicize their pro-active commitments towards this risk despite the fact that most “illegal” immigrants cross the hard borders of Europe legitimately through international airports and become “illegal” by staying beyond their visa validity period (Frontex, 2016). The functioning of these policies of control and migration management, regardless of their intended objectives, play a direct contribution to the tragedies that have unfolded in Europe and must be revised accordingly (Hess, et al. 2015).

THE SOCIO-CULTURAL DIMENSION

As the refugee crisis has poignantly demonstrated, the dynamics of borders are key components of social and political reality (Rumford, 2006: 155). The “crisis” of Europe’s borders is structured as such through the use of discursive frames propagated by the various managers of unease (Holmes & Castañeda, 2016: 2). Metaphorical devices of water or insectile imagery serve to widen
the schisms between the self and the other and reinforce visions of criminality, depravity, and even the *homo sacer* (Holmes & Castañeda, 2016: 7). A particular consequence of the “migrant as enemy” is the amalgamation of all non-wealthy, non-business, and non-tourist migratory flows into an incredibly myopic generalization that depicts migrants as defined by Tsoukala’s “discourses of fear.” This also serves to further weaken the legal status and legitimacy of asylum seekers, blurring the complex dynamics of movement and smoothing the hostile discourses which call for their exclusion (Ceyhan & Tsoukala, 2002: 23-4). This is coupled with the “socio-political production of migrant ‘illegality’”, through which asylum regimes systematically produce large amounts of “bogus” asylum seekers on the basis of overly stringent criteria. These definitional practices then eliminate chances of legitimate entry which can thus force, as the refugee crisis has demonstrated, would-be asylum seekers to attempt illegal entry (De Genova, 2013: 1180-1). This resultanty furthers the status of the migrant as a core economic/social/securitarian threat – “a social distribution of bad” (Bigo, 2002: 71).

These demonstrations of illegality are what De Genova calls “Border Spectacles,” a performance of extraordinary otherness which perpetuates the necessity of excluding migrants (De Genova, 2013: 1180-1). The widespread coverage of the refugee crisis is grounded in images of squalid camps, such as the “Jungle” in Calais (*The Guardian* 2016), or protesting behind fences (*The Washington Post* 2016), provide striking pictorial anchorage that explicitly promotes the forms of unease espoused by the “identity principle.” These images serve to evoke fear and othering as much as they do sympathy (Holmes & Castañeda, 2016: 6). Following Murray Edelman’s work on the political utility of constructing social spectacles (Edelman 1988), such graphic scenes of disarray and instability are attributed directly to be the characteristic of the migrant, rather than structural factors or influences from Western states. These media depictions fuel anxieties of European citizens who fear the “transformation” of their societal reality that mass migration will bring into a state that mirrors the scenes they view on television or read in the newspaper (Huysmans, 2000: 756). Again, this begets the importance of the alteration of perceptions that inform these bordering practices if substantive positive change is to occur in the handling of the refugee crisis.

The cultural function of Europe’s borders offers a means of artificially structuring an attempted homogenous European identity through othering, usually manifesting in the exclusionary discourses and constructions of racial otherness (Bigo, 2005: 60). It is through the lens of the refugee crisis that the internal contradictions of this method of formulating a cohesive European
identity is revealed. The extreme bordering measures and exclusionary discourses that have resonated from the European Union in attempt to prevent the corrosion of European culture, identity and cohesiveness have actually contributed to the its own social division and moral degradation. Far from unifying against a common threat, these techniques of power—the production and exclusion of difference—simultaneously serve an end contradictory to their original intention, resulting in rupturing the cohesiveness between member states and challenging the liberal ideological premises that the European Union, in its present form, was originally founded upon.

Conclusion

To summarize, in this paper I have demonstrated, in section one, the modernization of the EU’s border regime in an age of liquid modernity, defined as moving away from the management and control of territory towards one of flows and people. Various technologies have enabled the mobilization of the border, a “ferromagnetic” border, functioning in tandem with the harder borders of the perimeter of a territory. It is through the duality of Europe’s borders, the shifting, fluid properties they now hold are made actionable through the categorization of individual and groups on the basis of opaque, algorithmically-determined categories of risk. A significant issue with the ferromagnetic borders of Europe can be understood through the discursive environment in which they are constructed. The plethora of threats and risk attributed to immigration has imbued the EU’s border regime with a prejudice world view that it executes under the guise of statistical and computational rationality, necessity and neutrality. These complex categorizations are significantly informed through the production of discursive labels, socio-economic, securitarian, and identity, which are attached to migrants that produce a variety of criminogenic properties that discriminately function in pursuit of cultivating a desired bounded social reality. The relationality between these stigmatizing discourses and the ferromagnetic operation of Europe’s borders are, in many ways, mutually co-constitutive.

If indeed, borders are integral to human behavior, the ongoing refugee crisis that Europe is experiencing demonstrates an urgent need for a border regime constructed upon ideals of compassion and logics of accommodating pro-action, rather than fear and exclusion. Normative research conducted on the topic of shifting the border regime of the EU would be a daunting task but a most desirable one. If positive reform to Europe’s border regime is to be achieved, structural and institutional adjustments are not enough. The toxic
discourse that defines the migrant as enemy must be dissected, criticized, and resisted through the promotion of alternative understandings of the world beyond our own borders.

References


GENDER DIFFERENCES IN PARTICIPATION IN AND MOTIVATIONS FOR SEXTING: THE EFFECTS OF GENDER ROLE ATTITUDES, MASCULINITY, AND FEMININITY

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MENTOR: KATHERINE B. NOVAK

Abstract

Sexting, the exchange of sexually explicit messages, images, and videos through mobile phones, has in recent years become an increasingly publicized and common occurrence in our technologically advanced society (Strassberg, Rullo, & Mackaronis, 2014). The purpose of this study is to examine the effect of gender, gender role attitudes, and self-perceptions of masculinity and femininity on participation in and motivations for sexting. Using a cross-sectional design, a self-administered questionnaire was given to 222 Butler students during the early part of the spring 2016 academic semester. This questionnaire included items regarding demographics, the activity of sexting, personal participation in sexting, self-perceptions of masculinity and femininity, and gender role attitudes. While there was no gender difference in the frequency of sending sext messages, study results showed a significant relationship between gender and pressures to sext. Females are more likely to feel constrained by social norms when it comes to sexual behavior, whereas males have more freedom in this area. In addition, those with egalitarian gender role attitudes are more likely to accept sexting as a form of intimacy, indicating this technology has been integrated into sexual relationships.

Sexting, the exchange of sexually explicit messages, images, and videos through mobile phones, has in recent years become an increasingly common behavior and widely publicized issue in our society (Strassberg, Rullo, & Mackaronis, 2014). This relatively new form of sexual behavior has attracted considerable legal, public, and media attention, with the majority of research on the topic focusing on the participation of juveniles and those under 18. These studies concentrate on the prevalence of behaviors associated with sexting in teenagers and adolescents, as well as the relationship between sexting and cyberbullying (Conn, 2011). Another focus in the research literature is the legal consequences of sexting, including the laws and legislation sur-
rounding the activity and the classification of underage sexting as child pornography (Chalfen, 2009).

While there is an abundance of research on sexting among adolescents, research on sexting among college-aged young adults is relatively lacking, especially in relation to gender differences. Most studies about sexting among college students focus on the population of college students as a whole. Perkins, Becker, Tehee, and Mackelprang (2013) found that the majority of college-aged participants had not engaged in sexting within the past six months and those who did engage did so at a low rate, typically in the context of romantic relationships. Similarly, Reyns, Burek, Henson, and Fisher (2013) found that just 38% of the college students sampled admitted to participating in sexting. Some studies, however, have found a much higher rate of participation, finding sexting behavior to be prevalent in students’ lives, but engaging in the behavior occasionally or rarely (Dir, Coskunpinar, Steiner, & Cyders, 2013). Although some college students admit to engaging in sexting, this topic is relatively sensitive and private and some individuals may not feel comfortable disclosing their sexting behavior (Woolard, 2011).

In regards to differences in sexting based on gender, Winkelman et al. (2014) found little difference between men and women when it comes to general sexting behavior. However, Reyns, Henson, and Fisher (2014) determined that women were more likely to send sext messages, whereas men were more likely to receive sext messages. In terms of attitudes and expectancies about sexting, Dir et al. (2013) concluded single individuals and females tend to have more negative experiences and expectations. This is consistent with Perkins et al. (2013) who found that male reactions to receiving unrequested sext messages are much more positive than females, who tend to be less pleased and more embarrassed or upset. Perkins et al. (2013) also found that men who engage in sexting tend to endorse more hostile or negative beliefs about women. One study reported that men endorse the beliefs that men are sex-focused and women are sex objects more than women (Jewell & Brown, 2013), which could lead to the assumption that women could feel pressured into sending sexually explicit messages to men. This assumption was confirmed by Walker, Sanci, and Temple-Smith (2011), who found a link between gendered sexual violence against women and sexting. This link results in young women being coerced or pressured into sending sexually explicit text messages or images.

While attitudes and beliefs about sexting have been studied, the focus of this research is typically on general attitudes and not gender differences. Winkelman et al. (2014) reported that 65% of participants in their study had
a positive attitude toward receiving sext messages and photos, while only 20% reported having a negative attitude. Dir et al. (2013) concluded that sexting expectancies influence the decision to engage in sexting, with positive attitudes leading to increased participation and negative attitudes leading to decreased participation. This was confirmed in a later study by Hudson and Fetro (2015) who found that individuals’ attitudes toward sexting is one of the main predictors of college students’ sexting behaviors. There are many reasons for negative expectancies regarding sexting. These include the fear of disappointing family, potential embarrassment, and concern for reputation (Winkelman et al., 2014). Conversely, there are many reasons why individuals choose to engage in sexting and have positive expectancies concerning this behavior. Woolard (2011) found that over half of the study participants believed that sexting boosts confidence and an even larger percentage (64%) found it entertaining. In addition, Parker, Blackburn, Perry, and Hawks (2013) concluded that sexting can be a way to enhance both relationship satisfaction and sexual satisfaction among couples. Other reasons for engaging in this behavior include consensual sexual reasons such as to begin or maintain a relationship, the desire to feel sexy, and just because the individual wanted to (Perkins et al., 2013).

There has been some previous research about sexting among college students and young adults in terms of participation, gender, and motivations. However, none of these studies explored the effect of gender role attitudes or self-perceptions of masculinity and femininity on sexting, which is the main purpose of this study. Individuals’ understanding of masculinity and femininity and how individuals self-identify are likely to have an impact on motivations and participation in sexting. This is due to the double standard often present for men and women regarding sexual behavior and societal beliefs about appropriate sexual behavior based on gender identity (Flood, 2013). Because of the societal belief that sexual behavior is essential to a man’s masculinity, it can be predicted that this will influence men’s participation in sexting and potentially give them motivation to engage in this behavior. Since masculinity is tied to being in charge and being the initiator in sexual relationships (Seccombe, 2015), it can also be expected that men will be the initiators in sexting and be more likely to send sext messages. On the other hand, the societal belief that women are supposed to be more timid and emotional rather than sexual and dominant like men leads to the prediction that women will be more likely to receive sext messages and not initiate this behavior. The pressures to achieve the perfect standard of femininity may also impact motivations for women because sexting may be a way to validate their attractiveness. However, some women may choose not to sext or to keep this
behavior a secret due to the negative and demeaning labels that women often acquire when others find out about their participation in certain sexual behaviors (Flood, 2013).

Method

PARTICIPANTS

The data for this study were collected using a cross-sectional survey. Participants remained completely anonymous, as they were asked not to disclose their name on their survey. The questionnaire was approved by the Butler University Institutional Review Board and administered to individuals in a classroom setting at Butler University during regularly scheduled class periods. Surveys were collected after each participant finished. Professors were contacted based on personal connections and referrals from departmental administrative specialists, either in-person or via email, to encourage participation in the study from students of all class levels and from a range of academic majors. The study population for this study was young adults ages 18 to 24, the age group most likely to partake in sexting (Winkelman et al., 2014). The sample size was 222 students (63.5% female and 36.5% male).

MEASURES

The survey completed by the participants included questions regarding student demographics, the activity of sexting, and personal participation in and attitudes toward sexting. Two scales were used in this questionnaire.

Demographics. The survey included questions measuring students’ gender, relationship status, Greek membership, and class standing. The independent variable in this study is gender.

Participation in and attitudes toward sexting. One of the dependent variables in this study is participation in sexting. Sexting was defined for participants as the exchange of sexually explicit messages, photos, or videos through mobile phones. By giving this definition to participants at the beginning of the survey, all participants had the same definition of the broad concept of sexting. Participants were asked whether or not they had ever sent or received a sext (as well as within the past 6 months), as well as the frequency of their participation in sexting. They were also asked with whom this sexting occurs, their motivations for sexting (Parker et al., 2013), and reasons for not sexting.
(Winkelman et al., 2014). In addition, students were asked to indicate the extent to which they agreed or disagreed with a set of statements designed to measure their general beliefs about sexting and whether they felt pressure to engage in this behavior.

Self-perceptions of masculinity and femininity. One of the independent variables in this study was self-perceptions of masculinity and femininity. This was measured using the Bem Sex-Role Inventory (BSRI). “The BSRI contains 60 items presenting characteristics assumed to represent cultural definitions of traits considered to be masculine (self-reliant, forceful, etc.), feminine (jealous, sympathetic, etc.), and gender-neutral” (Lin & Billingham, 2014, p. 258). Respondents evaluated how well each trait describes them based on a seven-point scale, ranging from strongly agree to strongly disagree. Based on their total score, participants were categorized into one of four gender role types – masculine, feminine, androgynous, and undifferentiated (Lin & Billingham, 2014).

Gender role attitudes. This variable was measured using a commonly used gender-role attitudes scale consisting of four items (Wright & Bae, 2014). Participants were asked to indicate the extent to which they agree or disagree with the following four items.

“It is better for everyone involved if the man is the achiever outside the home and the woman takes care of the home and family.”

“Most men are better suited emotionally for politics than are most women.”

“A working mother can establish just as warm and secure a relationship with her children as a mother who does not work.”

“A preschool child is likely to suffer if his or her mother works.”

Participant responses to these four items were summed to create a composite index, with lower scores indicating more gendered attitudes toward women in this study.

Results

DESCRIPTIVE DATA AND SAMPLE

Descriptive statistics for the key variables in this study are presented in Table 1. The sample’s gender distribution (63.5% female & 36.5% male) was consistent with that of Butler students as a whole. However, students in-
volved in Greek life (sample 53.6% vs. Butler 30-40%) were overrepresented
in this sample. In addition, while students from all class standings are repre-
sented, first year students (40.1%) were overrepresented and juniors (18.5%)
and seniors (15.8%) were slightly underrepresented.

In regards to general sexting behavior, nearly half of the sample – 47.3% –
had ever sent a sext message. However, this behavior was shown to be less
frequent when taking into account the time elapsed since the last sext mes-
sage was sent. Of all respondents who admitted to ever sending a sext mes-
sage, 58.1% had sent a sext in the past six months. However, the majority of
respondents (78%) reported that they had had not sent a sext message within
the past two weeks. An overwhelming majority of respondents who had ever
sent a sext (86.3%) stated that the most frequent recipient for these messages
is a significant other. As shown in Table 1, respondents were more likely to
have ever received a sext message (65.8%) than to have ever sent a sext mes-
sage (47.3%). Of all respondents who had ever received a sext message, 73.5%
reported that they most frequently receive sext messages from a significant
other. Similar to the frequency of sending sext messages, receiving sext mes-
sages became less frequent as the time span decreased. The percentage of re-
spondents who had received a sext message in the past six months – 63% –
was almost the same as the percentage of those who had ever received one.
This became less frequent when the time frame decreased, with 75.2% report-
ing they had not received a sext message within the past two weeks.

Also presented in Table 1 are the descriptive statistics for the two
scales used in the questionnaire, the Bem Sex Role Inventory (BSRI) which
measures masculinity and femininity, and the gender role attitudes scale.
The distribution of respondents across the four categorizations of the Bem
Sex Role Inventory was fairly even. After totaling up scores on the BSRI,
26.6% of respondents were categorized as feminine, 26.1% as masculine,
25.2% as androgynous (partially both), and 22.1% as undifferentiated (nei-
ther one nor the other). In regards to gender role attitudes, the range of
scores was 7-20, with lower scores indicating more gendered attitudes toward
women. Overall, gender role attitudes were shown to be largely egalitarian,
with a mean of 15.86 for all respondents and a standard deviation of 3.072.

SEXTING ATTITUDES AND GENDER

Table 2 presents data regarding gender and sexting attitudes. Gender differ-
ences in responses for these questions were tested for significance using the
<table>
<thead>
<tr>
<th>Gender</th>
<th>Male</th>
<th>36.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>63.5%</td>
</tr>
<tr>
<td>Class Standing</td>
<td>First Year Student</td>
<td>40.1%</td>
</tr>
<tr>
<td></td>
<td>Sophomore</td>
<td>25.2%</td>
</tr>
<tr>
<td></td>
<td>Junior</td>
<td>18.5%</td>
</tr>
<tr>
<td></td>
<td>Senior</td>
<td>15.8%</td>
</tr>
<tr>
<td></td>
<td>Fifth Year or Above</td>
<td>0.5%</td>
</tr>
<tr>
<td>Relationship Status</td>
<td>Single</td>
<td>57.7%</td>
</tr>
<tr>
<td></td>
<td>In a Committed Relationship</td>
<td>41.0%</td>
</tr>
<tr>
<td></td>
<td>In an Open Relationship</td>
<td>1.4%</td>
</tr>
<tr>
<td>Currently Have a Greek Membership?</td>
<td>Yes</td>
<td>53.6%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>46.4%</td>
</tr>
<tr>
<td>Have You Ever Sent a Sext Message?</td>
<td>Yes</td>
<td>47.3%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>52.7%</td>
</tr>
<tr>
<td>Have You Ever Received a Sext Message?</td>
<td>Yes</td>
<td>65.8%</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>34.2%</td>
</tr>
<tr>
<td>Bem Sex Role Inventory</td>
<td>Feminine</td>
<td>26.6%</td>
</tr>
<tr>
<td></td>
<td>Masculine</td>
<td>26.1%</td>
</tr>
<tr>
<td>Categorizations</td>
<td>Androgynous</td>
<td>25.2%</td>
</tr>
<tr>
<td></td>
<td>Undifferentiated</td>
<td>22.1%</td>
</tr>
</tbody>
</table>

Table 1. Descriptive Statistics.

chi-square test. The chi-square test is used to determine whether there is a significant relationship between two categorical variables and the likelihood that this distribution is due to chance. Focusing on the first two items in Table 2, there is strong evidence of a relationship between gender and pressure to send sext messages. For the first item, females were more likely than males to feel pressured by someone else to send sext messages, $X^2 (3, N = 222) = 30.09, p = .000$. Conversely, for the second item, males were more likely than females to have pressured someone else to send sext messages, $X^2 (3, N = 222) = 36.28, p = .000$. There was also a statistically significant gender
I have felt pressured by someone else to send a sext*
Male (N = 81) 2.5% 13.6% 40.7% 43.2%
Female (N = 141) 17.0% 31.9% 15.6% 35.5%
All Respondents (N = 222) 11.7% 25.2% 24.8% 38.3%

I have pressured someone else to send me a sext*
Male (N = 81) 2.5% 18.5% 35.8% 43.2%
Female (N = 141) 0.0% 3.5% 15.6% 80.9%
All Respondents (N = 222) 0.9% 9.0% 23.0% 67.1%

Sexting is common among college students
Male (N = 81) 11.1% 67.9% 18.5% 2.5%
Female (N = 141) 14.3% 59.3% 25.7% 0.7%
All Respondents (N = 222) 13.1% 62.4% 23.1% 1.4%

Males are more likely than females to engage in sexting*
Male (N = 81) 3.7% 29.6% 61.7% 4.9%
Female (N = 141) 12.8% 39.0% 46.1% 2.1%
All Respondents (N = 222) 9.5% 35.6% 51.8% 3.2%

Females are more likely than males to engage in sexting
Male (N = 81) 3.7% 22.2% 69.1% 4.9%
Female (N = 141) 2.8% 27.0% 67.4% 2.8%
All Respondents (N = 222) 3.2% 25.2% 68.0% 3.6%

* Statistically significant
** Scale from strongly agree to strongly disagree

Table 2. Sexting Attitudes and Gender.

difference in the fourth item, as shown in Table 2. Females were more likely than males to hold the belief that males are more likely than females to engage in sexting, $X^2 (3, N = 222) = 9.45, p = .024.$

GENDER DIFFERENCES IN Sexting BEHAVIOR

Gender differences in sexting behavior are presented in Table 3. Contrary to the hypothesis that males are more likely to send sext messages, there was no evidence of a significant relationship between gender and the act of or frequency of sending sext messages. However, there was evidence of a relationship between gender and certain reasons for sending sext messages. As illustrated in Table 3, males were more likely than females to say hedonism (feels good or satisfies sexual needs) is a reason they send sexts, $X^2 (1, N = 105) =$
<table>
<thead>
<tr>
<th>Reasons for Sending Sexts (N = 44)</th>
<th>Male (N = 61)</th>
<th>Female (N = 105)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affirmation</td>
<td>14 (31.8%)</td>
<td>20 (32.8%)</td>
</tr>
<tr>
<td>Intimacy</td>
<td>33 (75.0%)</td>
<td>45 (73.8%)</td>
</tr>
<tr>
<td>Hedonism*</td>
<td>20 (45.5%)</td>
<td>11 (18.0%)</td>
</tr>
<tr>
<td>Peer Influence</td>
<td>1 (2.3%)</td>
<td>4 (6.6%)</td>
</tr>
<tr>
<td>Insecurity*</td>
<td>2 (4.5%)</td>
<td>11 (18.0%)</td>
</tr>
<tr>
<td>Coping</td>
<td>4 (9.1%)</td>
<td>6 (9.8%)</td>
</tr>
<tr>
<td>Other</td>
<td>2 (4.5%)</td>
<td>3 (4.9%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reasons for Not Sending Sexts (N = 37)</th>
<th>Male (N = 80)</th>
<th>Female (N = 117)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I would be afraid of disappointing my family</td>
<td>8 (21.6%)</td>
<td>32 (40.0%)</td>
</tr>
<tr>
<td>I would regret it later</td>
<td>25 (67.6%)</td>
<td>59 (73.8%)</td>
</tr>
<tr>
<td>It would hurt my reputation*</td>
<td>13 (35.1%)</td>
<td>46 (57.5%)</td>
</tr>
<tr>
<td>I would be embarrassed if anyone found out*</td>
<td>17 (45.9%)</td>
<td>55 (68.8%)</td>
</tr>
<tr>
<td>I would be afraid that it would affect my future if leaked (e.g. school, future employment)*</td>
<td>19 (51.4%)</td>
<td>61 (76.3%)</td>
</tr>
<tr>
<td>Other</td>
<td>8 (21.6%)</td>
<td>21 (26.3%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Have You Ever Received a Sext? (N = 81)</th>
<th>Male (N = 141)</th>
<th>Female (N = 222)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>62 (76.5%)</td>
<td>84 (59.6%)</td>
</tr>
<tr>
<td>No</td>
<td>19 (23.5%)</td>
<td>57 (40.4%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bern Sex Role Inventory Categories</th>
<th>Male (N = 61)</th>
<th>Female (N = 105)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feminine*</td>
<td>9 (11.1%)</td>
<td>50 (35.5%)</td>
</tr>
<tr>
<td>Masculine*</td>
<td>32 (39.5%)</td>
<td>26 (18.4%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender Role Attitudes*</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>14.38</td>
<td>3.212</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>16.70</td>
<td>2.650</td>
</tr>
</tbody>
</table>

* Statistically significant

**Table 3.** Gender Differences in Sexting Behavior.
In contrast, females were more likely than males to say that insecurity (worry partner won’t want you or won’t love you if you don’t) is a reason that they send sext messages, \( X^2 (1, N = 105) = 4.29, p = .038 \).

There was also evidence of a relationship between gender and certain reasons for not sending sext messages, as shown in Table 3. There were three reasons for not sending sext messages that proved to be significantly related to gender. The first was “It would hurt my reputation,” \( X^2 (1, N = 117) = 5.06, p = .024 \). The second reason was “I would be embarrassed if anyone found out,” \( X^2 (1, N = 117) = 5.56, p = .018 \). The third reason was “I would be afraid that it would affect my future if leaked,” \( X^2 (1, N = 117) = 7.25, p = .007 \). Females were more likely than males to say that these three statements are reasons they do not send sext messages. As hypothesized, some females may choose not to sext because of the negative or demeaning labels that may be given to them as a result of engaging in this behavior. Additionally, Table 3 demonstrates evidence of a relationship between gender and ever receiving a sext message \( X^2 (1, N = 222) = 6.58, p = .010 \). Contrary to the hypothesis that females are more likely to receive sext messages, males were actually more likely than females to have ever received a sext.

Gender differences can also be observed in both the Bem Sex Role Inventory categories and in the gender role attitudes scale. As shown in Table 3, females were more likely to be categorized as feminine and males were more likely to be categorized as masculine on the BSRI, \( X^2 (3, N = 222) = 20.79, p = .000 \). As shown in Table 1, the range for the gender role attitudes scale is 7-20, with lower scores indicating more gendered attitudes toward women. It is demonstrated in Table 3 that females tended to have more egalitarian attitudes than males, \( X^2 (13, N = 222) = 37.56, p = .000 \). However, both male and female means skewed more on the egalitarian end, with means of 14.38 and 16.70 respectively.

**RELATIONSHIP BETWEEN MASCULINITY, FEMININITY, AND GENDER ROLE ATTITUDES AND SEXTING BEHAVIOR**

Relationships between the BSRI scale and Gender Role Attitude scale and key variables were also examined using a bivariate correlation test. A bivariate correlation test is used to determine whether there is a statistically significant relationship between two variables. It also indicates the strength and direction of this relationship. Contrary to what was hypothesized, there was no evidence of a relationship between ranking as masculine or feminine on the Bem Sex Role Inventory and the act or frequency of sending or receiving
sext messages. However, there was evidence of a relationship between ranking as feminine on the Bem Sex Role Inventory and insecurity (worry partner won’t want you or love you if you don’t) as a reason for sending sext messages, $r(103) = .31, p = .001$. Those who were feminine were more likely than those who were masculine to say insecurity is a reason they send sext messages. There is also evidence of a relationship between gender role attitudes and ever receiving a sext message, $r(220) = -.15, p = .027$. Those with more gendered attitudes toward women were more likely to have ever received a sext message. In addition, a relationship was found between gender role attitudes and intimacy (to express love or make an emotional connection) as a reason to send sext messages, $r(103) = .25, p = .009$. Those who had less gendered and more egalitarian attitudes toward women were more likely to say that intimacy is a reason they send sext messages.

**Discussion**

Sexting behavior was relatively common in this sample of college students. Nearly half of students reported ever sending a sext message and an even higher number, about 3/5, reported ever receiving a sext message. This general participation rate is higher than what has been found in previous sexting studies (Reyns et al., 2013). This study also found a higher rate of engagement within the past six months than previous studies (Perkins et al., 2013), with both sending and receiving sexts averaging around 60 percent among this study’s participants. Perkins et al. (2013) found that the majority of college-aged participants did not engage in sexting within the past six months, which does not align with this study’s findings. However, results of this study in terms of the context of sexting behavior were consistent with the research conducted by Perkins et al. (2013). The majority of respondents reported they most frequently send and receive messages in the context of a romantic relationship, either to or from a significant other.

A relationship between gender and pressure to send sext messages was uncovered in this study. Females were more likely to report that they have felt pressured by someone else to send a sext message, whereas males were more likely to have pressured someone else to send a sext message. These findings were consistent with previous research on this issue and could be due to the idea that men who engage in sexting tend to endorse more hostile or negative beliefs about women (Perkins et al., 2013). In fact, Jewell and Brown (2013) reported that men endorse the beliefs that men are sex-focused and women are sex objects more than women do. This could lead to the as-
sumption that women oftentimes feel pressured or coerced into sending sext messages, which can also be linked to gendered sexual violence against women (Walker et al., 2011). The present finding that females were more likely to have felt pressured by someone else to send a sext message can be connected to the finding that females endorse the belief that males are more likely than females to engage in sexting. The females in this study could hold this belief as a result of their experiences with sexting in terms of feeling pressured to engage in this activity.

Consistent with a study by Winkelman et al. (2014), no gender difference was found in the act or frequency of sending sext messages. However, there was a gender difference found in receiving sext messages. Similar to findings from Reyns et al. (2014), males were more likely than females to have ever received a sext. A reason for this could be that males tend to have more positive reactions to unrequested sext messages than females (Perkins et al. 2013). In addition, it could be due to the fact that males are more likely than females to pressure others into sending sext messages, as found in the present research. Therefore, one way males may be receiving sext messages is through coercion or pressure.

There were gender differences in both reasons for sending sext messages and reasons for not sending sext messages. Males were more likely to say that hedonism (feels good or satisfies sexual needs) is a reason they send sext messages. Females were more likely to say that insecurity (worry partner won’t want you or won’t love you if you don’t) is a reason they send sext messages. These findings are consistent with the previously mentioned study conducted by Jewell and Brown (2013) which found that men tend to endorse the beliefs that men are sex-focused and women are sex objects more than women do. Therefore, the relationship between males and hedonism could occur because males participate in sexting behavior as a way to satisfy their own sexual needs. If males believe they are more sex-focused than females, they will be more concerned with their own needs and desires than those of their partner or the recipient of the sext. The relationship between females and insecurity, on the other hand, could occur because females are more likely to participate in sexting behavior to please their partner or the recipient of the sext. If males are more likely to hold the belief that men are sex-focused and women are sex-objects, females may feel pressured into sending sext messages to males because they may feel it is expected of them, or may be coerced into it.

In regards to reasons for not sending sext messages, females were more likely than males to say that they do not send sext messages for the following
reasons: “It would hurt my reputation,” “I would be embarrassed if anyone found out,” and “I would be afraid that it would affect my future if leaked.” This could be attributed to societal beliefs about what is appropriate for men and women and the double standard that is often present regarding sexual behavior. Women are more likely than men to receive negative or demeaning labels for participating in sexual behavior. Therefore, sexting can be viewed as breaking the norms set for women and females may not participate in sexting because of these external, societal factors.

No relationship was found between ranking as masculine or feminine on the Bem Sex Role Inventory and the act or frequency of sending or receiving sext messages. However, there was a relationship uncovered between ranking feminine on the BSRI and insecurity (worry partner won’t want you or love you if you don’t) as a reason for sending sext messages. Those who were categorized as feminine on the BSRI were more likely than those categorized as masculine to identify insecurity is a reason they send sexts. This can likely be attributed to findings from the same research used to explain the connection between being a female and insecurity as a reason for sending sexts (Jewell & Brown, 2013). If men endorse the beliefs that men are sex-focused and dominant (traditional traits of masculinity) and that women are sex-objects and submissive (traditional traits of femininity), then those who are feminine are likely to send sext messages to please their partner. They would, therefore, subconsciously take on that submissive role, or submit to possible pressures put on them to send sext messages.

It was found in the present research that those with more gendered attitudes toward women on the gender role attitudes scale were more likely to have ever received a sext message. However, when this relationship was examined separately for males and females, it was no longer statistically significant. This suggests that a gender difference could be seen with a larger sample size. The relationship between gender role attitudes and ever receiving a sext was close to being significant for females when the chi-square test was used, so it can be expected that this relationship is largely female-driven. That is, if a female has more egalitarian and less gendered attitudes toward women, they are less likely to receive sext messages. A reason for this could be that the sender of a sext message may know about the female’s egalitarian attitudes and may be less likely to send a sext message to them because of the knowledge of their gender role beliefs.

Those who have less gendered and more egalitarian attitudes toward women were more likely to say that intimacy is a reason they send sext messages. This could be due to a shift in norms and what is appropriate behavior
in the context of sexual relationships. Parker et al. (2013) concluded that sexting can be a way to enhance relationship and sexual satisfaction in couples, which reconfirms this change in norms. It can be presumed that sexting is becoming more accepted as a new form of sexual behavior, especially among those who have egalitarian gender attitudes. As society changes and men and women are seen as more equal, we are also seeing the incorporation of social media and technology into relationships, as exemplified by sexting as a way to express intimacy.

The results of the present study show that there is a significant relationship between gender and pressures to sext. Females are more likely to feel constrained by societal norms when it comes to sexual behavior, whereas males have more freedom in this realm. Those with egalitarian gender role attitudes are more likely to accept sexting as a form of intimacy, which incorporates technology into sexual relationships.

However, the findings of this study must be considered based on its limitations. This research was conducted using a sample from a small, private university in the Midwest so findings may not be generalizable to larger, public universities or to young adults who do not attend college. There could be some issues with measurement validity and reliability because of the sensitivity of the topic. Although the survey was completely anonymous, some students may have felt uncomfortable giving honest answers and taking the survey in general. There is also a limitation in the reasons offered in the survey question “Why do you not send sext messages?” Many respondents who wrote in an answer in the “other” category mentioned moral, personal, or other internal reasons for not sending sext messages. The other options offered in the questionnaire were mainly external and did not touch on internal factors. When these “other” answers were separated and tested for significance during data analysis, no gender relationship was found. However, if these answers were present in a category included on the survey, more respondents may have checked them.

The inclusion of the aforementioned internal factors as reasons for not sexting should be explored in future research examining the relationship between gender and sexting behavior. In addition, adding a question asking participants about their sexual orientation may be beneficial. During the data collection period, one respondent disclosed their sexual orientation on their questionnaire and stated that this was something that affected their responses. Future research exploring participation in and motivations for sexting may want to take the sexual orientation of individuals into account in order to more fully understand sexting behavior among college students.
References


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THE PORTRAYAL OF CHILD SOLDIERS IN DOCUMENTARIES AND HOLLYWOOD FILM

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Abstract

People in the United States are becoming increasingly mindful of child soldiers, with film being a critical means of bringing about awareness. However, awareness can be dependent upon media representation since most individuals in the U.S. do not have direct experiences with child soldiers. The purpose of the present study is to discover how the media has portrayed child soldiers in Hollywood films and documentaries, with an emphasis on the portrayal of violence, the role of women, and the reintegration experiences of child soldiers that are shown. Through a combined qualitative and quantitative content analysis, this study explores the depictions of young children in armed forces as a way to better understand society’s perception of child soldiers. Five Hollywood films and five documentaries were selected at random from an initial pool and viewed by two coders. The coders discovered that while women were portrayed more often than expected, the unique challenges faced by female child soldiers were not represented with great accuracy. Reintegration was depicted in most films; documentaries were more likely to focus on long-term reintegration and Hollywood films were more likely to focus on short-term reintegration. Hollywood films were also more likely than documentaries to portray violent action and show changes in the attitudes and emotions among the child soldiers over time.

Introduction

The use of children in military combat is a phenomenon that occurs all over the world. Many children witness the harsh reality of conflict in their everyday lives. Whether joining voluntarily or forced into the military, children of varying ages must enter combat, become combat leaders, cook meals, become spies, and participate in other duties (Boothby & Thomson, 2011). A child soldier is defined as:
Any person below 18 years of age who is, or who has been, recruited or used by an armed force or armed group in any capacity, including but not limited to children, boys and girls, used as fighters, cooks, porters, messengers, spies or for sexual purposes. It does not only refer to a child who is taking or has taken a direct part in hostilities. (Paris Principles and Guidelines on Children Associated with Armed Forces or Armed Groups 2007, p.7)

Recruitment of children for the armed forces occurs in more than 86 countries worldwide (Coalition to Stop the Use of Child Soldiers, 2008). While the typical recruit is a young boy, girls are often recruited and forced into the armed military and experience many of the same hardships that boys do. However, there are some experiences that are unique to female child soldiers. Of particular note, is the fact that females often experience sexual harassment and rape. Young girls are also often forced to become captive “wives” to older, superior men in the military. As a result of their loss of virginity, they are often ostracized from the community upon reintegration (Denov, 2012; Grétry, 2011; Mazurana & McKay, 2004). The loss of a young woman's virginity is often seen very negatively in society, leading to social and psychological harm, as well as the risk of becoming pregnant and having to care for small children at a young age.

There are several ways in which a child can leave the army and reintegrate into society, including fleeing voluntarily or with help from the Unity Program For Disarmament, Demobilization and Reintegration (UPNDDR), the process that is supported by the government and international NGOs (Grétry, 2011). According to UNICEF, more than 100,000 children have been reintegrated into their communities since 1998 (2011). While having so many children released from armed conflict is a positive occurrence, there can be a number of negative consequences as the result of the reintegration of child soldiers back into the community. Child soldiers often face psychological, economic, and emotional consequences, such as being unable to continue with their education and experiencing depression (Annan et al., 2013). They frequently exhibit behaviors such as demonstrating aggression with other children, being withdrawn, and/or experiencing recurring thoughts and memories of their most traumatic experiences (Boothby & Thomson, 2011; Grétry, 2011; Mazurana & McKay, 2004).

The issue of child soldiers is gaining greater attention in the United States because people are becoming increasingly aware of this issue through different media formats. Much of this is due to a 2012 social media campaign by the group Invisible Children which released a thirty-minute video about
Joseph Kony’s use of child soldiers in the Lord’s Resistance Army. The video became a sensation and reached one hundred million views in just under a week (Briones et al., 2013; Karlin & Matthew, 2012). Other media representation has occurred in documentaries, such as *A Perfect Soldier*, and Hollywood films, such as *Blood Diamond* and *Johnny Mad Dog*.

Previous research regarding the representation of child soldiers in the news media has discovered that they are portrayed as dangerous but helpless victims, creating stark contrast and ambiguity (Brooten, 2008). Further research has demonstrated that public perceptions mirror the media portrayal (Denov, 2012; Grétry, 2011; Lee-Koo, 2011).

Research has also been conducted on representation of child soldiers in film from an analytical perspective rather than an empirical perspective. These studies argue that movies and news media involving child soldiers often use the children as a means of portraying Africa and the East as savage or underdeveloped societies and tend to undermine the struggles involved with reintegration and the complex lives of child soldiers (Brooten, 2008; Martins, 2011; Lee-Koo, 2011). These studies have also noted that girls are rarely shown in these films and they are not accurate representations of the experiences that children have in countries of conflict (Denov, 2012; Booker, 2007; Mazurana & McKay, 2004).

It is important to understand how child soldiers are portrayed in films in the United States because their portrayal can affect society’s understanding of the issue. People in the United States rely heavily on media representation to understand issues with which they are personally unfamiliar. The western media can reach a large audience and media portrayals of child soldiers can be seen and accepted by audience members without questioning the reality of the representations. If the media portrays child soldiers as dangerous and aggressive, this may cause the public to fear these individuals and prevent them from integrating in a positive manner (Denov, 2012). Also, if the public does not accurately understand the complex hardships that children face during times of conflict, this could “lead to the creation of post-war reintegration programming that corresponds to dichotomous portrayals and fails to meet the intricate needs of former child soldiers” (Denov, 2012, 291).

Previous studies have examined the experiences of many child soldiers from different backgrounds and regions of the world. Some of these studies have specifically looked at the reintegration experiences of former child soldiers while others examined the unique experiences of young women in the armed forces. However, a number of these studies have been analytical in na-
ture, focusing on one or two films and do not offer a representative sample of media featuring child soldiers. Empirical studies have focused largely on the news media. A content analysis of the portrayal of child soldiers in film will provide a more accurate understanding of how films are likely to shape the public’s understanding of this issue.

This paper looks at the representation of child soldiers in documentaries and Hollywood films using a mixed quantitative and qualitative approach. Both categories are important as they tend to have different goals. Documentaries often attempt to entice an emotional reaction from viewers, whereas Hollywood films attempt to entertain the audience. Previous research has not examined the differences in the portrayal of child soldiers in these two forms of media. This paper focuses on the portrayal of female child soldiers, as well as children’s reintegration experiences, as these are two areas that are frequently misrepresented by the media (Denov, 2012; Booker, 2007; Grétry, 2011; Lee-Koo, 2011). The main research question addressed in this study is: What are the differences in the portrayal of child soldiers in documentaries versus Hollywood films? This current study also examines two sub-questions: 1) What aspects of young girls’ experiences as child soldiers are portrayed? 2) To what extent is a child’s reintegration into society depicted?

It is expected that the representations of child soldiers will be different between documentaries and Hollywood films because of their different goals. Documentaries may portray different attitudes of the child soldiers to evoke certain emotions in the audience. Hollywood films may have more violent action because violence tends to entertain audiences. It is also expected that female child soldiers will rarely be shown in Hollywood films, but will be more accurately represented in documentaries. Finally, it is hypothesized that reintegration will not be a focus of most documentaries and Hollywood films, despite its importance in the life of a child soldier.

Method

RESEARCH DESIGN

A content analysis of the portrayal of child soldiers in Hollywood films and documentaries was undertaken using both quantitative and qualitative techniques. A coding scheme was developed to measure the frequency of occurrence of key aspects of the portrayal of child soldiers including the level of violence, gender and gender roles, and reintegration experiences. The study is partially qualitative as some themes emerged during data collection that
were not anticipated and were not adequately captured by the codes initially created.

SAMPLE

To be included in this study, documentaries must have been released within the past ten years and child soldiers must be shown throughout, interviewed, or discussed within the film. For a Hollywood film to be used in this study, it must have been released within the past ten years and it must meet at least one of the following criteria:

1) The storyline is centered on child soldiers,
2) The film featured a child soldier as one of the central characters, or
3) The film featured child soldiers as minor characters that participated in the plot line of the story.

The list of eligible films was obtained through several strategies. The primary strategy was an advanced search in WorldCat Discovery, looking specifically for DVD videos, using “child soldiers” as the subject phrase. From this search, a list of movies released in the past ten years was developed. These movies were checked in Internet Movie Database (IMDB). If they were listed on IMDB, they were included in the sampling frame. If films are listed on IMDB, this means that they are more likely to be incorporated into the popular culture of society and therefore, it is more likely that the everyday citizen would have seen the film. IMDB was also used to determine if the film was labeled as a documentary or a Hollywood film for this study. Additional Google searches and the IMDB suggested movie feature were used to find additional movies to add to the sampling frame that were not part of WorldCat Discovery. Movies found through Google searches were checked in IMDB to see if they met the parameters for this study. Previous studies regarding child soldiers in films were also used to identify movies for the sampling frame (Denov 2012; Booker 2007; Martins 2011; Lee-Koo 2011).

Based on these strategies, a sampling frame of 17 eligible films was identified. Of these seventeen films, ten were randomly selected by drawing names out of a hat (see Table 1 for a complete list of films included in the study): 5 Hollywood films and 5 documentaries.
CODING SCHEME

A coding scheme was developed to measure the portrayal of child soldiers in documentaries and Hollywood films. Coding variables were grouped into several categories: Demographics, Gender, Reintegration, and Violence. The majority of the coding was quantitative, however, some parts were qualitative in order to gather unanticipated information.

Each child soldier participating in the plot line of the films was recorded as a principal character or a supporting character. A principal character was defined as one around whom the plot centers or who is essential to the story and a supporting character was defined as one with a significant relationship to and active impact on some aspect of the principal character’s life (Smith 1999).

<table>
<thead>
<tr>
<th>Documentaries</th>
<th>Hollywood Films</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Perfect Soldier</td>
<td>Ezra</td>
</tr>
<tr>
<td>Invisible Children</td>
<td>Beasts of No Nation</td>
</tr>
<tr>
<td>Grace, Milly, Lucy … Child Soldiers</td>
<td>Heart of Fire</td>
</tr>
<tr>
<td>Kassim the Dream</td>
<td>War Witch</td>
</tr>
<tr>
<td>Uganda Rising</td>
<td>Blood Diamond</td>
</tr>
</tbody>
</table>

Table 1. List of Films Used in the Study.

Since each character was categorized as either a principal or supporting character, a character’s exact time spent in the film was not recorded. Background characters were not be recorded and the researcher was able to compare the numbers of female principal and supporting characters versus male characters, offering an estimate of the differences in time spent in film based on gender. Each character was coded for gender, female roles, reintegration characteristics, and violent characteristics.

Female characters. A coding scheme was used to determine the roles held by each female principal and supporting character while in the armed forces. Several options for this role included food producer, cleaner, fighter, and sexual slave, among others. Coders were asked to describe the female’s attitude (if apparent) towards each role. For example, if a female character was por-
trayed as reluctant or excited to fight, this was recorded. Coders were also asked to describe sexual harassment and/or rape of a female character in the film and note the extent to which a female was ostracized for the loss of her virginity.

Reintegration. Coders rated the overall experience of the character’s reintegration on a scale from “very negative” to “very positive.” Character experiences with reintegration such as physical issues, economic issues, psychological issues and emotional issues were recorded. These issues were ranked for each character to see which affected the reintegration experience of the character the most. The method used to leave the armed forces was also recorded as well as the level of reintegration, with each character categorized as fully reintegrated, almost fully reintegrated, somewhat reintegrated, or beginning to reintegrate.

Violence. The level of violence committed by each principal character and supporting character was coded by recording the target of a child soldiers’ violence, the target’s relationship to the character, the weaponry used by the character, and the level of destruction against the target. These elements were coded based on violent scenes on film and the discussion of violent acts committed by a character. The coder was also asked to describe the character’s attitude at the time of the violence to indicate how the child soldier is portrayed. For example, if the child soldier is shown feeling extremely guilty and distraught over killing someone, the child is portrayed as a victim. If the child is seen rejoicing after committing a violent act, the child is portrayed as dangerous. The context of violence involving a child soldier was also recorded to understand the nature and context of the violence. Committing a violent act in war is different than starting a fistfight with a fellow soldier, though both contexts are important to understand the experiences of child soldiers.

To ensure the study’s reliability, two coders, the researcher and an additional coder, were used to test agreement between responses. The coder recruited by the researcher was trained and both tested the coding schemes on several films not selected for the sample. This ensured the coding schemes were reliable and user-friendly. After coding sheets were filled out for each character, the researcher checked agreement between the two coders for each question. If there were a large number of disagreements, that question was thrown out and not used in results. In the end, only one question, rating the level of integration, was thrown out due to low agreement. If there were only one or two disagreements for a question, then the answers were examined and the researcher would select one answer.
Results

The first sub-research question concerned the portrayal of the female child soldier’s experience in the armed forces. Over all ten films, there were five female principal characters, four male principal characters, one female supporting character, and five male supporting characters. Although there were more male characters, there were more female characters than expected. There were no statistically significant differences between the number of female characters portrayed in each film category (see Table 2).

The roles within the armed forces fulfilled by female child soldiers were examined to help understand how unique female experiences were portrayed. Females were depicted performing a variety of roles, such as cleaning, producing food, and caring for small children. All of the female characters were shown participating in military training and/or were said to have been prepared to participate in conflict. Sexual slavery and forced marriage are other important experiences of female child soldiers, but only two films (one documentary and one Hollywood film) and four characters were shown as captive wives or were said to have been captive wives. Only one film, *Grace, Milly, Lucy...Child Soldiers*, discussed the community stigma female child soldiers often face due to the loss of their virginity during armed conflict. Many communities view the female body as extremely sacred, so the loss of virginity is particularly significant (Denov 2012; Grétry 2011; Mazurana and McKay 2004).

Although many female characters discussed having fought in the armed forces, only one film, *War Witch*, showed a female character fighting in a conflict. The young female soldier in this film had the same experience as her male counterparts who participated in the fighting. There were three female characters depicted in Hollywood films, but only one was shown fighting. This is an inaccurate representation, as many young women participate in fighting.

The second sub-question for this research was concerned with the extent to which reintegration is shown in films featuring child soldiers. Many characters were shown or discussed as being back into society after spending time in the armed forces (see Table 3). There were many more characters reintegrated than was expected, with 86.7% of characters shown as fully reintegrated, almost fully reintegrated, somewhat reintegrated, or just starting to reintegrate.
Unfortunately, it was difficult to find results that were statistically significant due to a small sample size of only 15 characters. However, there were a few sets of significant results (see Table 4). A chi-square test of independence was conducted to examine the relationship between type of film and level of reintegration. The relationship between these variables was significant, \((X^2(3, N = 13) = 9.98, p = .019)\). A significant difference in level of reintegration was found, with documentaries more likely to focus on long-term reintegration, while Hollywood films were more likely focus on short-term reintegration. For example, only documentaries focused on the success stories some child soldiers experience.

Coders also looked at how the child soldier left the armed forces. This was considered answered if the child was shown or discussed as having returned to society. 85.7% of characters in Hollywood films escaped the armed forces and 42.9% of characters escaped in documentaries. Escaping is not the only way in which children leave the armed forces, as many are released or rescued by governmental or non-governmental organizations. Documentaries showed more variety in how children left the armed forces and it Hollywood films may have focused on escape for the entertainment value.

Hollywood films are more likely to have violent action, \(t(13) = -2.90, p = .012\). The total number of seconds that each character participated in a violent act was recorded, and the mean number of seconds for all characters in Hollywood films was 110.875, but this number was zero for documentaries. No characters in documentaries were shown participating in a violent act. Since documentaries had no character violence, many of the questions asked in the coding sheet became irrelevant. This data supports the hypothesis that there would be more violent action in Hollywood films.

<table>
<thead>
<tr>
<th></th>
<th>Principal</th>
<th>Supporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Documentary</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Hollywood Film</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

**Table 2.** Number of Females in Principal and Supporting Character Roles.
<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>13</td>
<td>86.7</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>13.3</td>
</tr>
</tbody>
</table>

Table 3. Number of Characters Shown or Discussed as Being Back Into Society.

<table>
<thead>
<tr>
<th></th>
<th>Documentaries</th>
<th>Hollywood Films</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fully Reintegrated</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>85.7%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Almost Fully Reintegrated</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>0.0%</td>
<td>16.7%</td>
</tr>
<tr>
<td>Somewhat Reintegrated</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>14.3%</td>
<td>50.0%</td>
</tr>
<tr>
<td>Just Starting to Reintegrate</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>0.0%</td>
<td>33.3%</td>
</tr>
</tbody>
</table>

Table 4. Level of Reintegration Between Documentaries and Hollywood Films.

In analyzing qualitative data, Hollywood films show a greater variety and change in attitudes and emotion over time among child soldiers. Female characters’ attitudes regarding the roles they participated in were recorded. Attitudes of characters who participated in violent acts were also recorded. Many characters in Hollywood films began their journeys as child soldiers with negative attitudes, with an attitude shift after spending time with the armed forces, and ultimately returning to extremely negative. Several characters who were depicted with changing attitudes were Komona in War Witch, Agu in Beasts of No Nation, and Dia in Blood Diamond. For example, in the movie Blood Diamond, after the rebel forces abduct Dia, he is forced to wear a blindfold and shoot a gun. Once he removes the blindfold, he discovers that he has shot and killed someone. Audience members can see the shock and disbelief on his face upon realizing this. Later in the film, Dia’s father attempts to rescue him, but Dia has become wrapped up in his role as a child soldier.
soldier and pushes his father away and yells loudly hoping a commander will hear and know someone is in the camp who does not belong. At the end of the film, after his father has successfully rescued him and talks to him, audience members can see the reluctance and guilt on Dia’s face as he begins to cry, realizing everything what he has done. This experience is not seen the documentaries included in this study because most characters were interviewed long after their time as child soldiers and audience members are only able to see their attitudes long after the fact.

Only one of the ten films were randomly selected for this study took place outside of Africa. The documentary, A Perfect Soldier, took place in Cambodia. However, child soldiers are recruited and used by armed forces in more than 86 countries world wide, including countries such as Afghanistan, India, Thailand, and Columbia (Coalition to Stop the Use of Child Soldiers, 2008). This reinforces previous analytical research demonstrating that films involving child soldiers portray Africa as a savage continent. If the only films involving child soldiers take place in Africa, then many people may assume that African countries are the only countries with child soldiers.

Discussion

Although there were more females depicted in the films than expected, there are still aspects of young girls’ experiences that were not represented in film to the extent necessary for the public to understand their challenges. Many females in the armed forces as child soldiers are forced to be sexual slaves or captive wives to higher-ranking members (Denov 2012; Grétry 2011; Mazurana and McKay 2004). However, this was only shown and depicted in one documentary and one Hollywood film. Showing captive wives shown in 20% of films about child soldiers does not enable audience members to truly understand the experiences of female child soldiers. Although there were three Hollywood films (the only film category featuring violence) that featured female characters, only one character was actually shown fighting during a film. The other female characters in Hollywood films either refused to fight or discussed fighting but were never depicted as fighting.

Movies in the United States may not be comfortable depicting women fighting and participating in the military because many combat positions in the United States armed forces were closed to women until very recently (Vergun, 2016). Historically, society has not seen the roles of women and men equally and it has taken a long time for people to be comfortable with the idea of a woman fighting in the military.
There was only one female child soldier depicted fighting in the military in the ten sample movies, and that film, *War Witch*, was made in the Netherlands. In fact, only one film depicting female child soldiers was made in the United States. Women are frequently shown in American media playing roles that agree with society’s ideas about the roles they should play. This helps explain why only one female was shown fighting in a film, why fewer females were depicted than males, and why certain challenges faced by female child soldiers were underrepresented.

Neither film category was able to represent child soldiers’ experiences more accurately than the other. Each category depicted different aspects more or less accurately. Documentaries focused on the unique challenges faced by females more frequently than Hollywood films. Documentaries are also able to show interviews from real former child soldiers to tell a true story from actual experience and depict the long-term effects that experience may have on a person. Hollywood films did well in depicting characters’ attitude and emotional changes over time and vividly depict the violent acts they often commit. There are still aspects of child soldiers’ experiences that were not shown in films. The challenges child soldiers face and the complexity of the issue cannot be fully understood by watching a few movies.

These films could potentially skew an audience’s perception of the issue or downplay the complexity of the issue of child soldiers. According to postmodernism theory within sociology, advancing technology has a direct effect on knowledge. Media is an extremely successful industry within the United States and the film industry in particular is very successful. Technology and the media can affect people’s knowledge of issues being depicted. A sociological postmodernist theorist, Jean Baudrillard (1981), suggests society has become so dependent upon models and maps that individuals within society have lost contact with reality, and that representation becomes our new reality. Baudrillard states, “It is no longer a question of imitation, nor of reduplication, nor even of parody. It is rather a question of substituting real process by its operational double, a metastable, programmatic, perfect descriptive machine...” (644).

As Baudrillard, and other postmodernists believe, the media is influential in creating our thoughts and beliefs on particular subjects. This is why representation of child soldiers in the media is so important. Until they are accurately represented in film and the media, the general public in the United States will most likely not have an accurate understanding of this important international issue. After watching a film about child soldiers, people may have inaccurate understanding of a child soldier’s experiences. They
may not understand the extent to which female child soldiers are used as captive wives or the amount of violence that females take part in. They also may not understand the hardships that child soldiers face during reintegration. If people do not have accurate knowledge about these experiences, then they may not be inclined to help, such as donating to organizations that work to stop the use of child soldiers, like Invisible Children and Child Soldiers International.

Researcher bias and reliability are limitations of this study, as there were only two coders and one coder was the researcher who may have had preconceived notions about the results despite best efforts. Another limitation is the system for coding: one of the documentaries, Uganda Rising, did not feature any characters, so the codebook could not be filled out. All the notes taken for this film were used as qualitative data. External validity is another limitation, as the researcher may not have been able to obtain all films involving child soldiers created between the years 2005 and 2015. The three strategies used to identify films seemed to be the most appropriate means of obtaining films on the topic of child soldiers, so hopefully, external validity is high.

References


TANGO: A SPANISH-BASED PROGRAMMING LANGUAGE

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Abstract

The first part of this article deals with the creation of my own Spanish-based programming language, Tango, using Spanish key words (instead of English key words). The second part relates to the design and implementation of a compiler that follows the grammar rules outlined in the Tango language in order to successfully lexically analyze, parse, semantically analyze, and generate code for Tango. This article begins with a description of the specific goals achieved in the Tango language, an explanation and brief examples of the Tango Grammar, a high-level overview of the compiler design and data structures used, and concludes with ideas for future work and helpful advice. The full grammar, list of keywords, and source code for the compiler can be found in the Appendices.

Introduction

This project, to write my own Spanish programming language, provided me with a way to combine both of my fields of study, Computer Science and Spanish. Before starting this project, I knew very little about the details that went into designing a programming language and compiler. From a high-level perspective, I learned about the importance of context-free grammars and the different phases that make up a compiler, which will be explained in further detail later.

Specific Goals

In creating the Tango programming language as well as the accompanying compiler, there are five main goals around which I centered this article. These goals are listed as follows:

1. To create a user-friendly programming language utilizing key words and a syntactic structure that closely resembles the Spanish language.
2. To design the language with a similar technical feel to that of some of the most widely used languages in both an educational and professional environment, such as Java and C++.

3. To allow the compiler to read and interpret both keywords and variable identifiers with special characters native to the Spanish language, such as accents and tildes above certain letters.

4. To provide a compiler that cross-compiles to run against the Java compiler instead of directly generating machine code.

5. To assure that the Tango language is Turing complete, or computationally universal.

The first goal forms an essential backbone to the entire project as a whole. There are over thousands of different programming languages utilized and available across a wide array of countries and cultures, and new languages and frameworks are being created everyday. However, a huge majority of these programming languages are English-based, meaning the keywords and syntactic structure are based on the English language [6]. Less than a handful of Spanish-based programming languages have been created including (but not limited to):

- GarGar, a Spanish procedural programming language based on Pascal for learning purposes [6].
- Latino, a language with completely Spanish-based syntax [6].
- RoboMind, an educational programming language available in multiple languages (including Spanish) [6].

Although the above mentioned Spanish-based programming languages accomplish a similar goal to the Tango language, Tango differs from these pre-existing languages in three key areas. First, the Tango language and compiler incorporate and support the usage of special characters (such as the accent mark and tilde) in both the key words of the language as well as any variables, constants, and function names generated by the user. Second, the compiler implementation utilizes cross-compilation to Java which facilitates simple installation and usage. The only requirement to successfully to download, compile, and execute a program written using Tango is to have a stable version of Java installed, while the Latino language, for example, lists thirteen different machine requirements in its installation documentation. Third, the key words and syntactical structure of Tango have a deliberate “Java-like” flavor with the intent to ease the transition to the usage of Java (or any similar language) given that Java is one of the most commonly used
server-side languages in the workforce today. All three of these differences either improve upon the existing implementations of Spanish based programming languages or offer additional features not present in the languages mentioned earlier that are more analogous to the Spanish language itself.

The purpose and goal behind creating Tango is to contribute to the growing technical community that spans across many languages and cultures. With the creation of this prototype version of a Spanish-based programming language, the educational and professional reach of such a tool could prove to be very beneficial in engaging and inspiring both young minds and experienced professionals within the field of technological development.

The second of the above-mentioned goals relates closely to the first goal in the sense of the basic design and feel of the programming language. It is essential that Tango is both intuitive to a native Spanish speaker, yet also compatible from a logical and syntactical standpoint to other more commonly used programming languages.

The third goal, which deals with the handling of special characters, proves to be highly unique to Tango. Unlike the English language, the Spanish language employs the use of accents and tildes above select letters forming characters that do not exist in English. These accents and/or tildes are essential to the language and are crucial to the meaning of certain words. The lack of an accent or tilde could change the meaning of the word entirely. Therefore, allowing for the compiler to adequately scan and process the possibility of these special characters is vital to the correctness and representation of the Spanish language as demonstrated in the Tango programming language.

The fourth goal mentioned pertains to a more technical implementation of compiler design. When designing the compiler, I chose to cross-compile to Java instead of generating machine code directly in the code generation phase. This decision, given the relatively short time provided to complete such an ambitious project, allowed me to create a more verbose and comparatively functioning programming language. If I had chosen to implement a compiler that generated machine code, the final product would be more limited both in scope and overall functionality. Another benefit to choosing to cross-compile to Java is that the Java compiler is machine independent. Also important to note, the target language is Java and the compiler is written in Java. However, these two choices are independent of
one another. More specifics of the compiler design and implementation will be
discussed later.

The fifth and final goal assures that the Tango language will be Turing
complete, meaning computationally universal. A language is considered
Turing complete if it can be used to simulate any single-taped Turing
machine [9]. Moreover, a “Turing machine can do everything that a real
computer can do” [9]. A universal language does not have to be complex [2].
In the case of Tango, the language itself is not extremely complex, but it does
meet the requirements to be considered Turing complete.

Overall, these five main goals helped drive and inspire both the research
and implementation process necessary to successfully create a prototype
programming language based primarily on the Spanish language.

Context-Free Grammar (CFG)

CONTEXT-FREE GRAMMAR AND TANGO

The grammar for the Tango programming language is a combination of
original productions and recognized production patterns from outside
resources. The basic definition of a context-free grammar is as follows:

A grammar consists of a collection of substitution rules, also called
productions. Each rule appears as a line in the grammar, comprising a
symbol and a string separated by an arrow. The symbol is called a
variable, or nonterminal. The string consists of variables and other
symbols called terminals. One variable is designated as the start
variable [9].

The purpose of a context-free grammar is to provide rules from which a
“syntactically valid string of terminals” can be generated [7]. The process of
generating a valid string of terminals is referred to as a derivation that can
be described as “a series of replacement operations that shows how to derive
a string of terminals from the start symbol” [7]. This same information can be
represented pictorially with the use of a parse tree (which will be utilized
later when providing sample productions) [9].

There are two main types of derivations: rightmost derivations and
leftmost derivations. For the purposes of simplicity and consistency, the
select examples shown will be utilizing a leftmost derivation meaning that “in
every step of the derivation, the leftmost nonterminal” is selected for
replacement [5]. Furthermore, the Tango grammar can be classified as LL(1)
which stands for the leftmost derivation when the input is scanned from left to right with one-token look ahead. To further clarify, a grammar is said to be LL(1) given that, “any two rules defining the same nonterminal must have disjoint selection sets [1]. Meeting the condition to declare a grammar LL(1) is crucial in order to construct a recursive descent parser which will be further explained in Compiler Design.

SPANISH LANGUAGE INFLUENCE & NUANCES IN GRAMMAR

Other important aspects of the Tango grammar worth mentioning relate to the selection of key words and syntactic structures in regards to the Spanish language. Three main challenges occurred when selecting key words and syntax:

1. How should the unpredictability of masculine or feminine nouns or descriptive keywords be handled?
2. What verb tense should be used when using verb-like keywords?
3. How should the overall syntax be structured in a way that closely resembles the overall structure of the Spanish language?

As for question one, a simple solution was utilized in order to account for descriptive keywords with different character endings depending upon the object being described. For example, in the Spanish language masculine words end in the letter ‘o’ whereas feminine words in the letter ‘a’. Since these word endings are dependent upon the noun or object being described, this created a problem of consistency when selecting keywords. However, instead of such words ending in an ‘o’ or ‘a’, all key words that fit this criteria end with the symbol '@'. The symbol '@' has become more commonly used and accepted within the Spanish community for words that could be either masculine or feminine. Some of the keywords for the Tango language that fall under this category include: nul@ (null), vaci@ (void), públic@ (public), nuev@ (new), ciert@ (true), fals@ (false). Note, the word in parenthesis following the Spanish key word is an English equivalent for reference for those unfamiliar with the Spanish language.

As for the second question regarding verb tense for verb-like keywords, yet another simple solution was implemented. In most English-based programming languages examples of verb-like keywords include words such as do, return, and print, to list a few [10]. In English, these verbs are in a command form (which there is only one kind of command conjugation for each verb regardless of the subject or audience). However, in Spanish, there are
multiple different ways to conjugate the command form of a verb and even more differences amongst different countries and dialects. In order to establish a consistent representation of verb-like keywords that would be understood by all Spanish speakers, the infinitive form of the verb serves as the best method of representation. For example, the following are Spanish verb-like keywords present in the Tango programming language: hacer (do), regresar (return), imprimir (print). Again, the word in parenthesis, is the English equivalent to the Spanish key word.

As for the third and final question, mirroring the Spanish language from a syntactical perspective proved to be the most difficult to emulate. However, one specific way in which this is prevalent in the grammar is the placement of the access identifiers in relation to a function definition. In the English language, adjectives are typically placed before the noun they are describing; take for example the phrase, “the long red dress”. In the Spanish language, adjectives are typically placed after the noun they are describing: take for example, the phrase, “el vestido largo y rojo” (which would directly translate to English as “the dress long and red”). This same principle can be seen in the syntax relating to a function definition demonstrated in Figure 1.

<table>
<thead>
<tr>
<th>Example Java Function Definition (English):</th>
</tr>
</thead>
<tbody>
<tr>
<td>public void func_name (int param1, int param2) {...}</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Example Tango Function Definition (Spanish):</th>
</tr>
</thead>
<tbody>
<tr>
<td>func func_name públic@ vaci@ (ent param1, ent param2) {...}</td>
</tr>
</tbody>
</table>

**Figure 1.** Note the differences between the two function definitions are very subtle but reflect the structural nuances of the Spanish language.

**SAMPLE TANGO PRODUCTIONS AND DERIVATIONS**

This section will walk through a simple example of productions and derivations using Tango’s grammar. The full grammar and list of keywords (as well as their relative English equivalent) are listed in detail in Appendix A.

As mentioned at the beginning of this section, Tango’s grammar is a mix of original productions and predefined productions from outside sources. Henceforth, the Tango grammar utilizes portions of the calculator grammar...
detailed in Michael Lee Scott’s Programming Language Pragmatics [7]. Select rules, or productions, are outlined and displayed in Figure 2:

```
stmt  ->  id = expr;
expr  ->  term term_tail
term_tail  ->  add_op term term_tail |
term  ->  factor factor_tail
factor_tail  ->  mult_op factor factor_tail |
factor  ->  ( expr ) | id | number
add_op  ->  + | -
mult_op  ->  * | /
```

Figure 2. Grammar productions (rules) from the LL(1) calculator grammar [7].

As mentioned earlier, only a small portion of the Tango grammar is illustrated in the above figures (Figure 2-6). To see the complete grammar and list of keywords, refer to Appendix A.

**Compiler Design**

The compiler design and implementation comprise a large portion of this article and are closely related to the grammar outlined in the previous section. The compiler construction can be broken into four different phases: lexical analyzer (scanner), parser, semantic analyzer, and code generator [2].

The lexical analyzer, or scanner, scans the source program character by character “recognizing which strings of symbols from the source program represent a single entity, or token” [2]. The lexical analyzer also identifies and categorizes the tokens according to their value in relation to the rest of the program. Some of the token types present in the Tango scanner include: keywords, variable identifiers, numeric values, arithmetic operators, special characters, etc.
Figure 3. First, Follow, & Predict Sets for the grammar productions in Figure 2 [7].
Figure 4. Leftmost derivation for the string, x=5;

```
stmt → id = expr;
stmt → x = expr;
stmt → x = term term_tail;
stmt → x = factor factor_tail term_tail;
stmt → x = 5 factor_tail term_tail;
stmt → x = 5 term_tail; (* factor_tail → *)
stmt → x = 5; (* term_tail → *)
```

Figure 5. Parse Tree for the string, x=5; [8]. Note: E stands for ε, the empty string
Figure 6. Parse tree for the sample Hello World program as seen in Appendix B [8]. Note: E stands for ε, the empty string

The second phase is the parser. Since the Tango language has an LL(1) context-free grammar, a recursive descent parser is the method utilized in completing this phase of the compiler. The parser will check for “proper syntax, issue appropriate error messages, and determine the underlying structure of the source program” [1]. The recursive descent parser illustrates “top-down (predictive) parsing” which relates directly to the grammar [7].

The third phase consists of semantic analysis. The semantic analyzer is intertwined with the parser. Whereas the parser checks the program for syntactic correctness according to the grammar rules, the semantic analyzer checks data types and other logical checks that can not be performed by the parser alone [1].

The fourth and final phase is code generation. During the code generation phase, a traditional compiler translates the successfully parsed tokens or syntax trees into “machine language (binary) instructions, or to assembly language” [2]. As mentioned previously in the section on Specific Goals, the Tango compiler does not directly generate machine code. In fact, the Tango compiler, in the code generation phase, generates equivalent Java code, which is then run against the Java compiler. The reasoning for choosing to cross compile to Java is explained in further detail in the section on Specific Goals.

If an error occurs during any phase of the compiler (lexical scanner, parser, semantic analyzer, or code generator), the compiler terminates and an
error message is displayed in the console with the line number and a potential error message depending on the error.

**CODE STRUCTURE & DATA STRUCTURES**

The overall structure of the compiler is a Java based application with five classes:

- *TangoCompiler.java* – This is the main class from which the program runs. When the program starts, the program prompts the user to enter the name of an input file to be processed. Instances of the *TangoScanner* and *TangoParser* objects are instantiated in order to begin processing the source program.

- *TangoScanner.java* – This class constitutes the lexical analysis, or scanner, phase of the compiler. The *TangoScanner* class utilizes instances of the *Token* class in order to create an array of tokens. Each time the scanner recognizes a new Token, a new Token object is created and added to the array of tokens which utilizes the ArrayList data structure.

- *Token.java* – This class contains all of the details and data related to the different token types available (including keywords) in the Tango language. A mix of simple arrays and single line functions are utilized inside the *Token* class. The array of Token objects is then processed in the *TangoParser* in which some of the simple functions created in the Token are used to perform necessary checks when moving through the parsing process. The *Token* class is also where the symbol table is stored which uses the Hash Table data structure.

- *TangoParser.java* – This class is the most intensive portion of the compiler. The *TangoParser* parses the array of tokens produced by the scanner using a recursive descent parser. Therefore, recursion is employed in order to move through the token stream. Semantic analysis occurs during this phase in which stack data structures are utilized. The *CodeGenerator* class is also instantiated inside of the parser and recursively generates Java code as the tokens are parsed.

- *CodeGenerator.java* – This class uses a FileWriter in order to write the equivalent Java code to a new file. The class consists of a multitude of void functions that are called within the recursive descent parser in order to successfully write to a file the newly generated code that can
then be compiled and run against the java compiler using the javac and java command.

Conclusion

FUTURE WORK

After investing close to eight months on the creation of the Tango programming language and compiler, I am proud to say that I have produced a functional, yet limited, prototype language. If I had more time to invest in this project, there is plenty of work left in order to make Tango a fully functional and bug free programming language that could be utilized primarily for educational purposes. Some of the additions and improvements, I would integrate into the language would include:

• **Expand the Functionality** – With such limited time, I was only able to implement some of the most basic functionality. Integrating more complex data structures, object-oriented principles, and additional libraries would both complement and improve upon the existing source code.

• **Optimization & Debugging** – Very little thought or effort was put into optimizing both performance and memory when implementing the compiler. This would be an important improvement in order to truly test the power and limitations of the compiler.

• **Modify Code Generation** – The current compiler cross compiles to Java by generating equivalent Java code that is run against the Java compiler. By modifying the code generation phase to directly generate machine code instead of Java code would allow the Tango language to no longer be dependent upon the Java compiler. Although this may increase efficiency and performance for the Tango compiler, this implementation would limit Tango to a fixed platform.

• **Interactive Website** – It would be beneficial as well to create an online platform or downloadable resource to which the public could access freely and directly in order to both write and run Tango programs. Along with this resource, creating a simple tutorial to aid users in programming in the Tango language with a link to the complete documentation would greatly complement all of the work that has been put forth in creating this project.
HELPFUL ADVICE

To anyone interested in completing a similar project, there are several tidbits of advice that are helpful and important to keep in mind when undergoing a project of this magnitude. First of all, make a timeline of important goals and milestones, and stick to it! Although this is a simple and obvious strategy when undergoing any type of project, it becomes even more crucial when dealing with a large code base with lots of moving parts.

Secondly, the grammar, derivations, and syntax trees are just as important as the actual code written to implement the compiler. If your grammar has errors (such as not meeting LL(1) criteria or highly ambiguous), then your compiler will have errors (making it even more difficult to implement). It is easier to fix an error when it is still just a grammar rule rather than when it has already been faultily integrated into the compiler. Lastly, start small and build up from there. It is tempting to want to implement everything at once. However, start with the basic functionality and then continue to modify and expand the language and compiler accordingly. Those are some of the pieces of advice that I would give to anyone with the desire to delve into compiler theory and design.

Whether or not the Tango programming language will ever be used or viewed outside the scope of this undergraduate thesis does not equate to the success or failure of the final product produced. The learning curve, work ethic, and technical knowledge I gained from completing this project cannot be monetized. Nevertheless, I have attained a new-found pride in the progress I have made in regards to the Tango language and developed a well-earned confidence in my technical abilities as a whole. The Tango programming language demonstrates a small but vital attempt to widen the reach of technological advancement across language and cultural barriers beginning in the educational realm and edging towards a professional environment. The language itself is young and in need of maturation and finesse. If nothing else, Tango can serve as a jumping off point and inspiration into the world of Spanish-based programming languages.

References


## Appendix A: List of Keywords & Full Grammar

<table>
<thead>
<tr>
<th>Spanish Keyword</th>
<th>English Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>ent</td>
<td>int</td>
</tr>
<tr>
<td>dec</td>
<td>double</td>
</tr>
<tr>
<td>cadena</td>
<td>String</td>
</tr>
<tr>
<td>lista</td>
<td>[]</td>
</tr>
<tr>
<td>bool</td>
<td>Boolean</td>
</tr>
<tr>
<td>ciert@</td>
<td>true</td>
</tr>
<tr>
<td>fals@</td>
<td>false</td>
</tr>
<tr>
<td>nuev@</td>
<td>new</td>
</tr>
<tr>
<td>si, sino, si, sino</td>
<td>if, else, if, else</td>
</tr>
<tr>
<td>para</td>
<td>for</td>
</tr>
<tr>
<td>mientras, hacer mientras</td>
<td>while, do while</td>
</tr>
<tr>
<td>clase</td>
<td>class</td>
</tr>
<tr>
<td>func$ principal()</td>
<td>public static void main(String [] args)</td>
</tr>
<tr>
<td>estátic@</td>
<td>static</td>
</tr>
<tr>
<td>vaci@</td>
<td>void</td>
</tr>
<tr>
<td>público@</td>
<td>public</td>
</tr>
<tr>
<td>nul@</td>
<td>null</td>
</tr>
<tr>
<td>regresar</td>
<td>return</td>
</tr>
<tr>
<td>escáner</td>
<td>scanner</td>
</tr>
<tr>
<td>imprimirLn</td>
<td>println</td>
</tr>
<tr>
<td>imprimir</td>
<td>print</td>
</tr>
<tr>
<td>sigEnt</td>
<td>nextInt</td>
</tr>
</tbody>
</table>

*Both wordrefernce.com [4] & The Oxford Spanish Dictionary [3] were referenced when selecting the appropriate Spanish keyword.*
FULL GRAMMAR

High Level Productions

program → clase id accessMod { classContents }
accessMod → public@
classContents → funcMain
funcMain → func$ principal() { stmtList }
stmtList → stmt stmtList |

Library Call Productions

stmt → imprimirln( printContent );
printContent → “stringValue” | id

Declaration & Assignment Productions

stmt → id = expr;
stmt → dataType id decTail;
decTail → = expr |
dataType → ent
dataType → dec
dataType → cadena
dataType → bool

expr → term termTail
expr → boolOp
termTail → addOp term termTail |
term → factor factorTail
factorTail → multOp factor factorTail |
factor → ( expr )
factor → id
factor → number
addOp → +
addOp → -
multOp → *
multOp → /
boolOp → ciert@
boolOp → fals@

If Statement Productions
stmt → si ( condition ) { stmtList } siTail
siTail → sino sinoTail |
sinoTail → { stmtList } | si ( condition ) { stmtList } siTail
condition → expr conditionTail
conditionTail → compOp expr | ε
compOp → == | != | > | < | >= | <=

While Loop Productions
stmt → mientras ( condition ) { stmtList }
stmt → hacer { stmtList } mientras ( condition );
FIRST, FOLLOW, PREDICT SETS

Key
Red = keyword/terminal
Blue = terminal
Normal = non-terminal

High Level Sets

First
program { clase }
accessMod { públic@ }
classContents { func$ }
funcMain { func$ }
stmtList { mientras, hacer, si, id, ent, dec, cadena, bool, imprimirln }
stmt { mientras, hacer, si, id, ent, dec, cadena, bool, imprimirln }

Follow
classContents { ‘’ }
funcMain { ‘’ }
stmtList { ‘’ }
stmt { ‘’, mientras, hacer, si, id, ent, dec, cadena, bool, imprimirln }

Predict
program → clase id accessMod { classContents } { clase }
accessMod → públic@ { públic@ }
classContents → funcMain { func$ }
funcMain → func$ principal() { stmtList } { func$ }

1 Separated by similar grammar concepts for organization
stmtList → stmt stmtList  { mientras, hacer, si, id, ent, dec, cadena, bool, imprimirln }
stmtList → { ’?’ }

Library Call Sets
First
stmt  { imprimirln }^{2}
printContent  { “, id }

Follow
printContent  { ’’ }

Predict
stmt → imprimirln( printContent );  { imprimirln }
printContent → “ stringValue “  { “ }
printContent → id  { id }

Declaration & Assignment Sets
First
stmt  {id, ent, dec, cadena, bool}^{3}
dataType  { ent, dec, cadena, bool }
decTail  { =, }
expr  { ‘(’, id, number, ciert@, fals@ }
term  { ‘(’, id, number}
termTail  { +, -, }
factor  { ‘(’, id, number }
factorTail  { *, /, }

^{2} Limited to FIRST set of library call productions
^{3} Limited to FIRST set of declaration productions
addOp \{ +, - \}
multOp \{ *, / \}

Follow

id \{ =, *, /, +, -, ;, \}'\}
number \{ =, *, /, +, -, ;, \)'\}
= \{ '\(', id, number, ciert@, fals@ \}
( \{ '\(', id, number, ciert@, fals@ \)
) \{ *, /, +, -, ;, \)'\}
+ \{ '\(', id, number \}
- \{ '\(', id, number \}
* \{ '\(', id, number \}
/ \{ '\(', id, number \}
ciert@ \{ ;, \)'\}
fals@ \{ ;, \)'\}
ent \{ id \}
dec \{ id \}
cadena \{ id \}
bool \{ id \}
stmt \{ '\)', mientras, hacer, si, id, ent, dec, cadena, bool, imprimirln\}
dataType \{ id \}
decTail \{ ; \}
expr \{ ;, \)'\}
term \{ +, -, ;, \)'\}
termTail \{ ;, \)'\}
factor \{ *, /, +, -, ;, \)'\}
factorTail \{ +, -, ;, \)'\}
addOp \{ '\(', id, number\}
multOp \{ '\(', id, number\}
Predict

\[
\text{stmt} \rightarrow \text{id} = \text{expr} \{\text{id}\} \\
\text{stmt} \rightarrow \text{dataType} \text{id} \text{decTail} \{\text{ent, dec, cadena, bool}\} \\
\text{dataType} \rightarrow \text{ent} \{\text{ent}\} \\
\text{dataType} \rightarrow \text{dec} \{\text{dec}\} \\
\text{dataType} \rightarrow \text{cadena} \{\text{cadena}\} \\
\text{dataType} \rightarrow \text{bool} \{\text{bool}\} \\
\text{decTail} \rightarrow = \text{expr} \{=\} \\
\text{decTail} \rightarrow \{;\} \\
\text{expr} \rightarrow \text{term} \text{termTail} \{\text{', id, number}\} \\
\text{expr} \rightarrow \text{boolOp} \{\text{ciert@, fals@}\} \\
\text{termTail} \rightarrow \text{addOp} \text{term} \text{termTail} \{+, -\} \\
\text{termTail} \rightarrow \{; , ')'\} \\
\text{term} \rightarrow \text{factor} \text{factorTail} \{\text{', id, number}\} \\
\text{factorTail} \rightarrow \text{multOp} \text{factor} \text{factorTail} \{*, /\} \\
\text{factorTail} \rightarrow \{+, -, ; , ')'\} \\
\text{factor} \rightarrow ( \text{expr} ) \{()\} \\
\text{factor} \rightarrow \text{id} \{\text{id}\} \\
\text{factor} \rightarrow \text{number} \{\text{number}\} \\
\text{addOp} \rightarrow + \{+\} \\
\text{addOp} \rightarrow - \{-\} \\
\text{multOp} \rightarrow * \{\ast\} \\
\text{multOp} \rightarrow / \{/\} \\
\text{boolOp} \rightarrow \text{ciert@} \{\text{ciert@}\} \\
\text{boolOp} \rightarrow \text{fals@} \{\text{fals@}\} 
\]
If Statement Sets

First

\[
\begin{align*}
\text{stmt} & \rightarrow \{ \text{si} \} \quad (1) \\
\text{siTail} & \rightarrow \{ \text{sino} \} \\
\text{sinoTail} & \rightarrow \{ '{', \text{si} \} \\
\text{condition} & \rightarrow \{ '(', \text{id}, \text{number}, \text{ciert@}, \text{fals@} \} \\
\text{conditionTail} & \rightarrow \{ '==', '!=', '>', '<', '>=', '<=' \} \\
\text{compOp} & \rightarrow \{ '==', '!=', '>', '<', '>=', '<=' \}
\end{align*}
\]

Follow

\[
\begin{align*}
\text{stmt} & \rightarrow \{ '!', \text{mientras}, \text{hacer}, \text{si}, \text{id}, \text{ent}, \text{dec}, \text{cadena}, \text{bool}, \text{imprimirln} \} \\
\text{siTail} & \rightarrow \{ \text{si}, '(', \text{id}, \text{number}, \text{ciert@}, \text{fals@}, \text{imprimln}, ')\}' \} \\
\text{sinoTail} & \rightarrow \{ \text{si}, '(', \text{id}, \text{number}, \text{ciert@}, \text{fals@}, \text{imprimln}, ')\}' \} \\
\text{condition} & \rightarrow \{ ')' \} \\
\text{conditionTail} & \rightarrow \{ ')' \} \\
\text{compOp} & \rightarrow \{ '(', \text{id}, \text{number}, \text{ciert@}, \text{fals@} \}
\end{align*}
\]

Predict

\[
\begin{align*}
\text{stmt} & \rightarrow \text{si} \ (\text{condition}) \ \{\text{stmtList}\} \ \text{siTail} \ \{ \text{si} \} \\
\text{siTail} & \rightarrow \text{sino} \ \text{sinoTail} \ \{ \text{sino} \} \\
\text{siTail} & \rightarrow \{ \text{si}, '(', \text{id}, \text{number}, \text{ciert@}, \text{fals@}, \text{imprimln}, ')\}' \} \\
\text{sinoTail} & \rightarrow \{\text{stmtList}\} \ \{ '{' \} \\
\text{sinoTail} & \rightarrow \text{si} \ (\text{condition}) \ \{\text{stmtList}\} \ \text{siTail} \ \{ \text{si} \} \\
\text{condition} & \rightarrow \text{expr} \ \text{conditionTail} \ \{ '(', \text{id}, \text{number}, \text{ciert@}, \text{fals@} \} \\
\text{conditionTail} & \rightarrow \text{compOp} \ \text{expr} \ \{ '==', '!=', '>', '<', '>=', '<=' \} \\
\text{conditionTail} & \rightarrow \{ ')' \} \\
\text{compOp} & \rightarrow \text{==} \ \{ \text{==} \} \\
\text{compOp} & \rightarrow \text{!=} \ \{ \text{!=} \}
\end{align*}
\]

\(^4\) Limited to FIRST set of if statement productions
compOp → < {<} 
compOp → > {>} 
compOp → <= {<=} 
compOp → >= {=>} 

**While Sets**

**First**

stmt {mientras, hacer} \(^5\)

**Follow**

stmt {',', mientras, hacer, si, id, ent, dec, cadena, bool, imprimirln}

**Predict**

stmt → mientras (condition) {stmtList} {mientras} 
stmt → hacer {stmtList} mientras (condition); {hacer}

\(^5\) Limited to FIRST set of while loop productions
Appendix B: Example Programs

EXAMPLE PROGRAM #1: HOLA MUNDO! (HELLO WORLD!)

Tango Sample Code

clase holaMundo público {  
    func$ principal() {  
        #variable declaration  
        bool URC = ciert@;  

        #if statement  
        si ( URC ) {  
            imprimirln("Hola Mundo! Hoy es el URC");  
        }  
        sino {  
            imprimirln("Hola Mundo! Hoy NO es el URC");  
        }  
    }  
  }

Generated Java Code

public class holaMundo {  
    public static void main(String [] args ) {  
        #variable declaration  
        Boolean URC = true;  

        #if statement  
        if ( URC ) {  
            System.out.println("Hello World! Today is the URC");  
        } else {  
            System.out.println("Hello World! Today is NOT the URC");  
        }  
    }  
}
EXAMPLE PROGRAM #2: JUEGO DE ADIVINAR (GUESSING GAME)

Tango Sample Code

clase juegoDeAdivinar pública{
    func$ principal() {
        ent n = 27;  #hard coded number for now
        ent usuario = 0;
        escáner e = escáner() nuev@;

        mientras (usuario != n) {
            imprimirln(“Elige un número entre 1 y 100”);
            usuario = e.sigEnt();

            si (usuario < 1) {
                imprimirln(“Su número es invalido.”);
                imprimirln(“Elige un número entre 1 y 100”);
            } sino si(usuario > 100) {
                imprimirln(“Su número es invalid.”);
                imprimirln(“Elige un número entre 1 y 100”);
            } sino si(usuario > n) {
                imprimirln(“Que boludo...demasiado alto!”);
            } sino si(usuario < n) {
                imprimirln(“Que idiota...demasiado bajo!”);
            } sino {
                #usuario == n
                imprimirln(“Perfecto! Está correcto!”);
            }
        }
    imprimirln(“Gracias por jugar!”);
}
}
Generated Code

```java
import java.util.Scanner;

public class juegoDeAdvinar {
    public static void main(String [] args) {
        int n = 27; //hard coded number for now
        int user = 0;
        Scanner e = new Scanner(System.in);

        while (user != n) {
            System.out.println("Choose a number b/w 1 & 100");
            user = e.nextInt();
            if (user < 1) {
                System.out.println("Your number is invalid");
                System.out.println("Choose number b/w 1 & 100");
            } else if (user > 100) {
                System.out.println("Your number is invalid");
                System.out.println("Choose number b/w 1 & 100");
            } else if (user > n) {
                System.out.println("Too High!");
            } else if (user < n) {
                System.out.println("Too Low!");
            } else { //user == n
                System.out.println("Perfect! You got it right!");
            }
        }
        System.out.println("Thanks for playing!");
    }
}
```

Appendix C: Source Code

See the full source code repository via the online resource GitHub: https://github.com/ashleyzeg/HonorsThesis.