December 2016

The Hilltop Review, vol 9, no 1. Fall 2016

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Notes from the Editor

Dear graduate Hilltoppers and readers of The Hilltop Review,

I am deeply honored to serve Western graduate students as the new editor of The Hilltop Review and I am pleased to share with you that this is the 10th year in which the journal has published an issue. The editorial board members and I are proud to offer the opportunity to WMU graduate students to get involved by submitting papers and artwork for publication. We also welcome new members who are enthusiastic about reviewing and editing submissions for our spring 2017 issue.

To be honest, I would not have been able to get this job done if I had not had the help and assistance of many around me. First of all, I would like to wholeheartedly thank my father, Ahmadreza Ameli, who has persistently motivated me to be courageous and passionately accept the challenge of serving The Hilltop Review as an international student. Furthermore, I would like to express my deep gratitude for Maira Bundza, ScholarWorks Librarian and Associate Professor of University Libraries as well as Rebecca Staple, Ph.D. student in English Literature, who formerly served The Hilltop Review as the director and editor. Maira and Rebecca have been generously and patiently assisting me in learning about the significant responsibilities of the editor of this journal. My next special thanks go to Damon Chambers and Amaury Pineda, the president and vice-president of the WMU Graduate Student Association, for their heartwarming support and encouragement since I started this job. Additionally, I would like to warmly thank the hardworking and committed editorial board members: Rebecca Staple, Erin S. Lynch, Hannah G. Pankratz, Caroline M. Ray, Séan Patrick Geizer, Sita Karki, and McKenna N. Corlis. I also appreciate Amy Sailer and Jhosua Rodriguez for taking care of the copy-editing and formatting jobs of the current issue. Lastly, I am thankful to all the graduate students who have been involved in our fall 2016 issue either as submitters or reviewers.

Due to the general theme we have agreed upon for the current issue, our journal is featuring articles and artwork from different fields. I am glad to congratulate the winners of the fall 2016 issue of The Hilltop Review Awards: Scott A. Lemons will receive $500 in first place paper for “The International Business Risk of Terrorism: A Pragmatic Framework for Assessing its Impact on the U.S.-Based, Small- to Medium-Sized Enterprise's Supply Chain Operations”; Daniel J. Patten will receive $250 in second place paper for “The Uncatchable Crook: Pursuing Effective State Crime Control”; Keli Masten will receive $150 in third place paper for “Hawthorne's American Gothic: A Blackness Ten Times Black”; and Raed M. Salih will receive $250 and the placement of his artwork on the cover for the best artwork entitled “Hilltop”.

I look forward to receiving your papers, artwork, and creative writing submissions, as well as applications for reviewing your peers’ works for the spring 2017 issue. I would like you to know that your contribution will be of great assistance in reaching our goals and in taking the Hilltop to new heights.

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1. WMU’s athletic teams initially went by the nickname “Hilltoppers,” reflecting the institution’s original Prospect Hill campus. The moniker often led to confusion with other schools that had a similar nickname and became outdated when the University expanded beyond its hilltop confines. The nickname “Hilltoppers” was resurrected in 2001 to identify a new volunteer group that is clearing and cleaning up Prospect Hill.
Articles
Article 1
The International Business Risk of Terrorism: A Pragmatic Framework for Assessing its Impact on the U.S.-Based, Small- to Medium-Sized Enterprise’s Supply Chain Operations

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Introduction

Fundamentally, the key to business success is superior efficiency and effectiveness relative to one’s competitors. The globalization of markets—the ongoing integration and growing interdependency of countries worldwide (Cavusgil, Knight, & Riesenberger, 2017)—provides internationalizing firms the opportunity to augment efficiency and effectiveness via access to lower-cost inputs and new markets, among other factors. Rapid technological innovation—a significant enabler of globalization—has dramatically reduced the time required to transport physical
resources and to communicate information, thereby accelerating the internationalization of firms’ value-chains. Major prospects exist to optimize use of inputs (i.e., efficiency) and increase sales growth (i.e., effectiveness).

Yet, the integrated, interdependent, global economies also expose firms to heightened risks. The firm must assess the various environments (e.g., economic, political, and cultural) worldwide across all of the countries or regions in which it operates, or is connected to, to identify what risks are relevant to its operations. The range of such risks is considerable; therefore, this subject paper focuses on a specific type of country risk: terrorism.

The business sector constitutes one of the primary strategic targets of contemporary terrorism because attacking it can cause severe and cascading economic damages to the targeted businesses (Sinai J., 2016). Firms are vulnerable not only to attacks on their own assets, but also to attacks on their suppliers, customers, transportation providers, communication lines, and other elements in their eco-system (Sheffi, 2001). Essentially, the firm’s integrated network of sourcing, production, and distribution, organized on a worldwide scale (Cavusgil, Knight, & Riesenberger, 2017), is especially vulnerable to the potential consequences of a terrorist attack. Accordingly, while the risk of terrorism precludes none of the firm’s functional activities, particular attention is given to adverse implications for the firm’s supply chain operations.

**Literature Review**

To provide a contextual basis for supply chain executives at U.S.-based, small- to medium-sized enterprises, a broad evaluation of contemporary commentary pertaining to country- and firm-level implications and corresponding approaches precedes a pragmatic risk assessment and mitigation planning framework. First, country-level considerations are assessed. Such considerations include adverse implications for the United States’ economy, infrastructure, and national will. Subsequently, several country-level mitigation approaches are reviewed, including regulatory, diplomatic, and military approaches. The firm’s understanding of country-level mitigation approaches is critical, not only to recognize the potential impact of political and legal environmental factors on the firm, but also to comprehend what role the firm may need to take in their application. Secondly, firm-level considerations are evaluated. In general, the firm-level adverse implications and mitigation approaches are more internally facing (i.e., pertaining to the firm’s value-chain) than the country-level considerations. At the firm-level, logistical, supply network, and technological implications are of focus, followed by attention to the various strategic and operational risk mitigation approaches proposed by contemporaries.

**Country-Level Considerations**

Essentially, terrorists execute attacks by way of one or more of the following mediums: land, air, sea, or information technology. In the context of international business, the most concerning physical means is arguably an attack by sea. Nearly 80% of global trade is transported in ships’ hulls.
Accordingly, countries have invested significant resources in maritime infrastructure, containerized trade, energy supply chains, information technology-driven cargo movements and processes accelerating financial transactions in order to harness the benefits of globalization (Sakhuja, 2010). But, there are also associated risks: several studies of maritime security have identified vulnerability in the movement of oceangoing cargo in containers. Each transfer of a container from one party to the next is a point of vulnerability in the supply chain (Caldwell, 2008). Terrorists can target the container in two ways: (1) by tampering with a legitimate consignment, or (2) by assuming a legitimate trading identity and using it to ship a dangerous consignment (Marlow, 2010). The container could potentially be the Trojan horse for the terrorist (Traina D. J., 2010). Similarly, other physical means of an attack, by land or air, also present significant threats; however, contemporary literature suggests the global supply chain’s foremost vulnerability to an attack via physical means is by sea.

Increasingly, terrorist groups are also utilizing information technology to carry out attacks. Terrorist groups and their supporters (as well as state sponsors of terrorism, such as Iran) now employ cyber weapons to inflict economic damage against their adversaries (Sinai J., 2016). Potential targets include government agencies, stock exchanges, and other government and financial information systems. Further, not only are terrorist groups utilizing information technology to carry out cyber-attacks, they are also utilizing its offshoot of social media to spread propaganda. In effect, it has become increasingly unnecessary for terrorist groups to radicalize its adherents and sympathizers at physical sites around the world—arguably, a much easier prospect for counterterrorism units to regulate. Instead, propaganda spread via social media acts as a means to radicalize followers from a distance. In fact, a ten-year study found that approximately 90% of organized terrorism on the Internet is performed today through social media (Marcu & Balteanu, 2014). Followers are spurred into action, to conduct small-scale, local acts of terror (e.g., recent mass shootings in San Bernardino, CA, and Orlando, FL, in 2016). Additionally, terrorist organizations use social media for getting information about their enemies; soldiers of the United States, Canada and Great Britain have been trained to erase their personal data from social networking sites (Marcu & Balteanu, 2014).

Accordingly, disruption to maritime commerce, information systems, or other resources by means of terrorism would have significant adverse implications for the global economy, its supporting infrastructure, and the national will of its citizens. Let’s explore these country-level implications and corresponding mitigation approaches.

**Economic implications.** Any slowdown or closure of a port has global repercussions as the gridlock would cause vessels to be unable to discharge, which in turn would cause ships to stop being loaded that are bound for the United States. Then the foreign terminals would begin to slow down because of the backlog, and finally the manufacturing industries would be forced to slow down production. Prices would soon surge to record-breaking levels on most commodities, and the end result would be an economic spiral downward for the global economy (Traina D. J., 2010). In a Booz Allen Hamilton sponsored simulated scenario, the detonation of weapons...
smuggled in cargo containers shut down all U.S. seaports for 12 days. The results of the simulation estimated that the seaport closures could result in a loss of $58 billion in revenue to the U.S. economy along with significant disruptions to the movement of trade (Caldwell, 2008).

Likewise, attacks carried out by other physical means, such as by land or air, can also result in severe adverse implications for the economy. This was horrifically demonstrated in the aftermath of September 11, 2001, when al Qaeda's airborne attacks against the World Trade Towers not only caused the loss of life of some 3,000 civilians (the terrorists likely expected thousands more fatalities), but cost New York City's economy about $83 billion (in 2001 dollars) in total losses, including both direct and indirect costs (Sinai D., 2006). A less quantifiable consequence is that resulting from an act of cyber-terrorism against significant financial systems, such as a major stock exchange, or a critical interconnected infrastructure, such as the United States power grid. However, research by the security firm McAfee and the Center for Strategic and International Studies (CSIS) posits a $100 billion annual loss to the U.S. economy and as many as 508,000 U.S. jobs have been lost as a result of cyber-crime (Kasturi and Sons Ltd, 2013); while difficult to connect to specific terrorist groups, these are staggering figures.

**Infrastructure implications.** A nation's critical infrastructure constitutes one of the primary strategic targets of contemporary terrorism because attacking its key sectors and assets can cause severe damage to virtually all sectors of the affected society (Sinai D., 2006). Of crucial concern is a cyber-terrorism attack on the United States' infrastructure. The situation is alarming when one considers that America has many thousands of dams, airports, chemical plants, federal reservoirs, and power plants (of which 104 are nuclear), most of which have integral systems controlled by sophisticated computer systems or other automated controllers (White & Stratton, 2003). The potential implications are wide-ranging, as one weak link in an information system could provide a terrorist organization access to disrupt, or even potentially destroy, a primary enabler of commerce.

Correspondingly, a terrorist attack carried out by physical means (land, air, or sea) would have adverse consequences for the transportation infrastructure. Within days of the September 11, 2001 terrorist attack, manufacturers began to experience disruptions to the flow of materials into assembly plants (Sheffi, 2001). At sea, terrorists have successfully attacked a range of targets, from poorly secured platforms such as oil tankers and ferries to making forays against highly defended warships, port infrastructure and oil terminals (Sakhuja, 2010). As most global trade passes by sea and through ports, and then is ultimately transported by land locally, the ripple effect of a terrorist attack on maritime infrastructure would be substantial. It is instructive to note that such disruptions may not be caused by the attack itself, but rather by the government's response to the attack: closing borders, shutting down air traffic, and evacuating buildings throughout the country (Sheffi, 2001).

**National Will implications.** Terrorist groups believe that if the public's national will is broken, then U.S. military power would be irrelevant (Harrison, 2007). Diminishing national will manifests itself in consumer behavior after a terrorist attack. When consumers feel less safe, it changes their
spending patterns. Businesses change their investment and employment plans. Essentially, a lack of confidence negatively impacts growth (Sinai J., 2016). National will implications are generally a byproduct of every country-level consideration. For example, terrorist groups regard the financial sector as extensions of Western economic power and dominance (Sinai J., 2016); so, a cyber-attack on the country's financial information systems aims not only to generate adverse consequences for the nation’s economy and infrastructure, but also to impact the country’s national will—citizen confidence in the strength of its country and identity—by targeting symbols of the country’s national values and beliefs.

Regulatory approaches. Security for the global supply chain following September 11 has greatly improved (Traina D. J., 2010). The United States government has implemented multi-layered systems of security and taken regulatory action to minimize the prospect of another catastrophic terrorist attack. In an effort to strike a balance between the need for security and free-flowing maritime commerce, U.S. Customs and Border Protection (CBP), a component of the Department of Homeland Security (DHS) responsible for protecting the nation’s borders at and between official ports of entry, oversees the Customs-Trade Partnership Against Terrorism program, known as C-TPAT (Caldwell, 2008). The program implemented several affective initiatives. The first initiative was the twenty-four hour rule, which required shippers to provide more information about the cargo and a definitive address for the consignee 24 hours prior to the loading of the shipment at a foreign port (Traina D. J., 2010). Basically, shippers must prepare a complete itemized list of its containerized cargo. This information along with current and strategic intelligence are the core elements of Automated Targeting Systems (ATS), a system that combines real time information from several CBP mainframe systems that filters this information and provides a risk based assessment (Traina D., 2008). Further, the CBP has implemented the use of non-intrusive inspection (NII) technology and mandatory exams for all high-risk shipments (Caldwell, 2008). These initiatives or policies are all general and apply across the board; in that sense they focus on the general threat rather than any specific one (Marlow, 2010). Marlow’s viewpoint is notable, as literature suggests the program has faced management and operational challenges. Yet, there are potential benefits for the firm, as C-TPAT also aims to secure the flow of goods bound for the United States by developing a voluntary antiterrorism partnership with stakeholders from the international trade community (Caldwell, 2008). The public-private partnership aspect of C-TPAT’s approach receives further attention in the firm-level considerations section of this paper. Traina sums up the country-level, port-of-entry, regulatory approaches well by noting there is no silver bullet in the securing of [sic] trade, but these measures and new policies in the future will continue to provide layered risk management without impeding the flow of global trade (Traina D. J., 2010).

Regulatory measures have also been undertaken to address the contemporary concern of cyber-terrorism. For example, the Cyber-Security Research and Development Act was signed into law in 2002. Additionally, the SAFETY (Support Anti-terrorism by Fostering Effective Technologies) Act, which encourages the development and deployment of new anti-ter-
rorism products and services by providing liability protections for both the sellers and the users (Close-Up Media, Inc., 2013), was also signed into law in 2002 as part of the Homeland Security Act. In doing so, the government has created an environment conducive to anti-terrorism innovation, to continually modernize protection of critical infrastructure vulnerable to cyber-attacks. The social networks have taken measures against the terrorist and extremist groups as well, defining usage rules that prohibit the use of their services to promote terrorist activities...however, there are difficulties in implementing these measures due to the impossibility of monitoring in real time the large volume of information generated by users (Marcu & Balteanu, 2014). There is a major gap here, as Marcu and Baltenau go on to note that the countering of terrorism in social media requires fundamental reassessment at the political and strategic level and at the level of fighting against terrorism, taking in consideration the development of social networks, which should not be neglected (Marcu & Balteanu, 2014).

Diplomatic approaches. The complexity of the problem facing security providers and policy makers is that the combination of intersecting functional and institutional arrangements across the supply chain makes it almost impossible for a single actor within a single channel to effectively trace and monitor operations across different channels (Marlow, 2010). Therefore, the war on terror has required the full spectrum of diplomatic, economic, military, law enforcement, intelligence, and public opinion networks to work together. It has shown that common interests, values, and a coordinated approach are critical to combat common security concerns. Further, it has emerged that even a country as powerful as the United States needs international support to obtain intelligence, undertake surveillance, track terrorists, and physically reach its enemies (Sakhuja, 2010).

An example is the Container Security Initiative (CSI), which placed CBP staff at designated foreign seaports to work with its foreign counterparts to inspect high-risk cargo for weapons of mass destruction before the cargo is shipped to the United States (Caldwell, 2008). This has been implemented through bilateral agreements allowing both nations to send inspectors to the other country to inspect containers (Marlow, 2010). Specifically, the program has placed officers in 58 foreign ports to work with customs officials of the host countries to inspect almost 90 percent of the cargo (Traina D., 2008). States have established a number of maritime arrangements that pivot on joint operations, multilateral exercises, intelligence sharing, training, and capacity building (Sakhuja, 2010). The U.S. Customs and Border Protection (CBP) agency has offered reciprocity agreements with all the participating states and some have taken advantage of this opportunity. In addition, CBP shares information with all the participating states (Traina D. J., 2010).

Dr. Joshua Sinai proposes a Framework for Critical Infrastructure Resilience to Terrorism in which diplomatic collaboration is necessary. He contends that the overall strategic goal of homeland security is for a nation to build up its resilience to terrorism by effectively implementing six mission areas: the pre-incident components of (1) anticipation, (2) preparation, (3) prevention, and (4) protection, and the post-incident components of (5) response and (6) recovery (Sinai D., 2006). The aforementioned regulatory
and diplomatic initiatives primarily address the anticipation, preparation, and prevention elements, which are of primary concern in the context of this paper. Dr. Sinai concludes that these are exceedingly complex, difficult, and costly missions that require coordinated, integrated, and focused efforts from all sectors in society, involving a country's federal government, state and local governments, the private sector, the population, and the international community (Sinai D., 2006).

**Military approaches.** Popular wisdom repeatedly recites that the war on terrorism is unlike any past war. But popular wisdom has not yet adapted to the most fundamental way in which this war is different. In fact, it is not so much a war as it is a new era of continuous danger (Sheffi, 2001). The threat of cyber-terrorism makes the prospect of a singular military approach impractical. Of most critical significance is military presence, as opposed to military force, near home-country ports of entry and critical waterways around the world. Appropriate positioning of Navy warships and other military assets assists the previously discussed regulatory and diplomatic approaches. The effectiveness of the drone strike and/or boots on the ground approach is questionable; while arguably necessary, its use in a vacuum does not appropriately address and mitigate adverse implications for the country’s economy, infrastructure, or national will.

**Firm-Level Considerations**

The preceding evaluation of national-level considerations provides context for the environmental factors and adverse implications facing the firm, as well as for the suggested approaches to assess and mitigate the risk and impact of a terrorist attack on its supply chain operations. But, how prepared is the firm? Helferich and Cook note the following: The typical large U.S. corporation has given disaster preparedness a low priority because of competing business issues, the lack of recognition of the true level of disaster vulnerability, and an assumption that the service and government sectors are responsible for disaster response. The threat of more terrorist attacks creates a powerful motivation for management to explore the processes to secure the performance of the commercial supply chain (Helferich & Cook, 2002). As this subject paper caters to small- to medium-sized enterprises, it is arguable that such firms give less consideration to the threat of terrorism than its larger counterparts due to the proportionately fewer resources available to utilize for such a purpose. Yet, as previously noted, firms are vulnerable not only to attacks on their own assets, but also to attacks on their suppliers, customers, transportation providers, communication lines, and other elements in their eco-system (Sheffi, 2001). Therefore, regardless of size, the use of resources to assess the firm’s individual situation is paramount. Additional resources for mitigation purposes will depend on the results of such an assessment. Accordingly, executives must gain an understanding of firm-level considerations via evaluation of contemporary viewpoints pertaining to logistical, supply network, and technological adverse implications and their corresponding strategic and operational risk mitigation approaches.

**Logistical implications.** The role of logistics has become increasingly
important for companies due to longer and increasingly complex supply chains (Christopher M., 2011). Some argue the supply chain's complexity is both its vulnerability and its strength (Harrison, 2007), as multiple modes of transportation may be available to the firm if a terrorist attack were to target one of the modes; that said, the attack itself is not the only consideration. Measures taken by the US and other governments to improve homeland defense have burdened the global transportation system, creating longer and less reliable lead times (Sheffi, 2001). Firms must realize adverse implications may result from the attack, as well as the country's response to the attack. Additionally, the firm's supply chain practices, such as outsourcing, single sourcing...and inventory reduction (Christopher M., 2011), potentially increase its susceptibility to adverse consequences. Today's global and highly efficient supply chains lack buffers to protect against such disruptions (Konig & Spinler, 2016). Notably, the culmination of these dynamics may have severe adverse consequences for the firm—particularly, its supply chain logistics. For example, a terrorist attack against a firm's supply chain might cause widespread disruption to customer delivery capabilities, leading to a loss of short-term revenue and creating a service failure (Closs, Speier, Whipple, & Voss, 2002). In effect, the longer the supply chain, and the larger the number of countries it travels through, the greater the potential impact to the firm's logistics activities. Firms may experience loss, damage, or delay of cargo as well as loss of visibility of such cargo. Further, much depends on the firm's foreign market entry strategy. The exporting firm relies heavily on the maritime supply chain for movement of goods, whereas firms that use a foreign direct investment internationalization strategy may have more flexibility, depending on the location of the terrorist attack and the firm's facilities.

Supply network implications. As organizations increase their reliance on integrated supply chain networks, they become more vulnerable to their suppliers' disaster risk profiles (Lockamy III, 2014). Since September 11, many US (as well as European) companies are reconsidering the wisdom of using overseas suppliers. Offshore suppliers may be less expensive, but they require longer lead-time and may be more susceptible to disruptions in the transportation system (Sheffi, 2001). The firm's supply network is generally impacted due to adverse implications for the firm's logistical activities; however, unlike other impacted groups (such as customers), the supply network may not be as insulated by intermediary buffer inventory and other assets. Further, poor infrastructure and/or unstable political environments in offshore outsourcing countries may be less capable of mitigating or adequately responding to a terrorist attack.

Technological implications. The firm's information technology infrastructure is of upmost concern. For the past two to three years, cyber-attacks and related incidents have been entering the global risks landscape as among the most likely and most potentially impactful risks – in North America, cyber-attacks ranks as the most likely risk by far (World Economic Forum, 2016). Attacks launched in cyberspace involve the use of various methods of exploiting the weaknesses of the computers' security, including cyber viruses, stolen passwords, and secret entry software that allow the intruders to penetrate the systems without being detected (Marcu & Balteanu,
Firms with sensitive intellectual property, responsibility for critical resource generation and/or distribution (such as electricity and water), or asset management responsibility for significant financial instruments are at notable risk. Furthermore, as firms increasingly rely on sophisticated, interdependent, and connected information systems, any technological disruption could adversely impact the firm’s supply chain operations.

**Strategic and operational approaches.** Perhaps there is nothing the firm needs to undertake to mitigate the impact of a terrorist attack on its supply chain operations, as John Harrison suggests by noting that continued emphasis on intelligence sharing, aggressive military and police operations, and restricting terrorist access to funds and other materials will be sufficient to secure society as well as the supply chain (Harrison, 2007). Most contemporaries disagree, however, and recommend a variety of approaches for the supply chain executive’s consideration.

The country-level regulatory approaches portion of this subject paper alluded to the prospect of leveraging public-private partnership to minimize the threat of terrorism to ports of entry within the global supply chain. To expand, C-TPAT aims to secure the flow of goods bound for the United States by developing a voluntary trade community comprised of importers; customs brokers; air, sea, and land carriers; and other logistics service providers (Caldwell, 2008). C-TPAT is a voluntary initiative, where organizations that choose to participate by increasing security in the supply chain will most likely receive less scrutiny of incoming cargo (Traina D. J., 2010). Essentially, the government seeks to improve overall supply chain security by improving member firms’ security methods—enticing them to do so via incentive.

Other scholars also suggest firms embrace public-private partnership. Sheffi notes, recognizing the important role that government will play in the new era, and recognizing that government cannot do it alone, that corporate executives need to start considering the government, both federal and local, as a partner in corporate life (Sheffi, 2001). To elaborate on Sheffi’s overall strategic approach, to prepare for another attack he recommends firms analyze investments in three main categories: (1) supplier relationships and awards, (2) inventory management criteria, and (3) knowledge and process backup (Sheffi, 2001). He goes on to recommend improvements in shipment visibility, improved collaboration between trading partners and across enterprises, better forecasting through risk pooling, and further assumption of security roles and responsibilities.

Sheffi’s last point ties in with Closs, Speier, Whipple, and Voss’ A Framework for Protecting Your Supply Chain, which outlines ten security competencies the firm should institute. The text notes, security competencies are created through the development of security capabilities such as infrastructure, processes, assets, and resources that achieve and maintain supply chain security. Security competencies include: 1) Process Strategy; 2) Process Management; 3) Infrastructure Management; 4) Communication Management; 5) Management Technology; 6) Process Technology; 7) Metrics; 8) Relationship Management; 9) Service Provider Collaboration Management; and 10) Public Interface Management (Closs, Speier, Whipple, & Voss, 2002). Effectively, the authors offer a framework to guide implementation.
Another perspective is that of Chang, Ellinger, and Blackhurst, who present a succinct comparison of the characteristics of the different supply chain mitigation strategies that are identified in the extant SCRM literature: redundancy vs. flexibility, buffering vs. bridging, hedging vs. control, and increased capacity vs. increased responsiveness (Chang, Ellinger, & Blackhurst, 2015). Fundamentally, each dichotomy is a mirror to the others. Redundancy approaches focus on limiting or mitigating the negative effects of risk by increasing product availability by keeping some resources in reserve to be used in case of a disruption (Chang, Ellinger, & Blackhurst, 2015), whereas flexibility approaches involve building organizational and inter-organizational capabilities to sense threats to supply continuity and to respond to them quickly (Zsidisin & Wagner, 2010).

Conversely, Christopher and Holweg propose adjusting the traditionally rigid supply chain model to one of structural flexibility, which refers to the ability of the supply chain to adapt to fundamental changes in business environment (Christopher & Holweg, 2011). The authors outline approaches that exhibit structural flexibility, such as dual sourcing, asset sharing, flexible labor arrangements, rapid manufacture, outsourcing, and use of alternate distribution channels, all of which merit consideration to counteract the adverse implications of a terrorist attack. There are other strategic approaches, such as Hale and Moberg’s secure site location decision process (Hale & Moberg, 2005). Yet, as Sinai notes, terrorist threats do not affect all businesses alike (Sinai J., 2016). The applicability of each risk mitigation approach is quite dependent on the individual firm’s situation. Accordingly, supply chain executives should consider a pragmatic risk assessment and mitigation planning framework to evaluate the firm’s individual situation.

A Pragmatic Risk Assessment and Mitigation Planning Framework

Contemporaries suggest a combination of public-private partnerships to proactively reduce the likelihood of a terrorist attack, and the implementation of operational redundancies (assets and infrastructure) to minimize its impact to ongoing business operations. While perhaps these approaches may be appropriate, supply chain executives require a framework to adequately assess the firm’s individual situation. Accordingly, the following managerial framework adapts existing and presents new risk assessment and risk mitigation planning approaches for the supply chain executive’s pragmatic use. The framework progresses through three phases: 1) the business aspects evaluation phase wherein firm-level attributes are weighed; 2) the supply chain aspects evaluation phase wherein supply chain characteristics are assessed; and 3) the mitigation planning phase wherein the business and supply chain aspects output the suggested level of intensity the firm’s mitigation plan should assume.

1. Business Aspects Evaluation

Assesses, by way of numerical weighting, firm-level attributes that influence the firm’s susceptibility to adverse implications resulting from terrorism.

1.1 Business category (b). As Sinai points out, certain business cat-
categories are of greater risk to terrorist attack than others. These include transportation (aviation, ground and maritime), energy (nuclear power, oil and gas facilities, and chemical plants), financial institutions (such as stock exchanges and banks), tourism (hotels and restaurants), and shopping malls (Sinai J., 2016). Based on this context, assign a value to this aspect between zero (0) and ten (10), where zero (0) represents the lowest risk-level and ten (10) represents the highest level of risk.

1.2 Customer distance (d). Not dissimilar to the business category, the firm’s distance from the customer is also of concern. For example, service industries such as tourism are generally fulfilling customer requirements more closely in terms of space and time than low-tier manufacturers of goods, which may be several levels removed from the end consumer. There are additional security cost and brand equity considerations the short customer distance firm must consider. Therefore, assign a value to this aspect between zero (0) and five (5), where zero (0) represents a long customer distance and five (5) represents a short customer distance.

1.3 Level of connectivity (n). Another business aspect the executive must consider is how dependent the firm’s operations are on connectivity. In this sense, connectivity refers to the firm’s level of reliance on information technology to conduct business, which if impacted, would create significant challenges to ongoing operations or business continuity in the event of a terrorist attack. Further, as Sheffi points out, corporations with several warehouse management systems, multiple order entry systems, or several incompatible manufacturing and financial systems, are more vulnerable than companies who standardized their operations and can move personnel and processes between locations if a single location goes down (Sheffi, 2001). So, both the level of connectivity and the deviations between the connected systems must be considered. Assign a value to this aspect between zero (0) and five (5), where zero (0) represents the lowest risk-level and five (5) represents the highest level of risk.

1.4 Level and type of internationalization (i). As reviewed, the focal firm’s level of globalization may correlate to increased operational risk. Further, differing levels and types of risk may result from the firm’s foreign market entry method. For example, the exporting firm relies heavily on the maritime supply chain for movement of goods, whereas firms that use a foreign direct investment internationalization strategy may have more flexibility, depending on the location of the terrorist attack and the firm’s facilities. While they may have more control, numerous interconnected facilities worldwide may expose the firm to threats unique to specific country or regional environments. Via critical self-evaluation, assign a value between zero (0) and ten (10), where zero (0) represents the lowest risk-level and ten (10) represents the highest level of risk.

1.5 Calculate the business aspects sum (BAS). Add each of the preceding attribute values to calculate your firm’s numerical business aspect risk level. The lowest possible value is zero (0) and the highest possible value is thirty (30).

\[ \text{BAS} = \text{Business category} + \text{Customer distance} + \text{Connectivity} + \text{Internationalization} \]

2. Supply Chain Aspects Evaluation
Assesses, by way of numerical weighting, supply chain attributes that influence the firm’s susceptibility to adverse implications resulting from terrorism.

2.1 Supply chain complexity (c). Essentially, the supply chain executive must assess both the length and the depth of its complete supply chain. The greater the number of countries it travels through, the more entities with which it interacts, and the more differentiated the product and service offerings, the greater the risk to the organization. Assign a value between zero (0) and ten (10), where zero (0) represents the lowest complexity and ten (10) represents the highest complexity.

2.2 Resource use strategy (r). Evaluate the firm’s general practice regarding inventory and capacity. Does the firm buffer inventories and plan for excess capacity? Or, conversely, does the firm generally seek to maximize inventory turns and utilization of capacity? Assign a value between zero (0) and five (5), where zero (0) represents the former and (5) represents the latter.

2.3 Supply network characteristics (s). Assess aspects of the firm’s supply network, such as its ratio of offshore suppliers to local suppliers, the nature of contractual agreements with such suppliers, and its use of dual sourcing. Then, assign a value between zero (0) and five (5), where zero (0) represents low risk relative to the preceding, and other, considerations (i.e., low offshore to local supplier ratio, strong contracts, and abundant use of dual sourcing), and five (5) represents high risk relative to these characteristics.

2.4 Reliance on transportation infrastructure (t). Conduct an analysis of the firm’s transportation methods to ship and receive goods. Consider breakdown by mode, such as land, air and sea, as well as by distance covered—are transports generally local, regional, national, or international? Give attention to frequency of shipments and receipts, as well as its relative importance to the overall operation. Assign a value between zero (0) and ten (10), where zero (0) represents the lowest risk and ten (10) represents the highest risk.

2.5 Calculate the supply chain aspects sum (SCAS). Add each of the preceding attribute values to calculate your firm’s numerical supply chain risk level. The lowest possible value is zero (0) and the highest possible value is thirty (30).

\[ \text{SCAS} = \text{Complexity}(c) + \text{Resource use}(r) + \text{Supply network}(s) + \text{Transportation}(t) \]

3. Mitigation Planning

Lastly, add the business aspects sum (BAS) to the supply chain aspects sum (SCAS) to derive an overall numerical risk level (ONRL). See Table 1 for the suggested level of intensity the firm’s mitigation plan should assume, and recommended action, based on the total.

\[ \text{ONRL} = \text{Business aspects sum} (\text{BAS}) + \text{Supply chain aspects sum} (\text{SCAS}) \]

References

Limitations and Conclusions
The preceding framework is intended for pragmatic use, hence its simplicity. The inherent simplicity of the framework, however, may limit its use in actual practice. The framework was developed via culmination of observed research and the author’s practical experiences as a supply chain executive. Accordingly, a wide range of country- and firm-level considerations are reviewed to cater to a wide audience of executives in various industries and contexts. The framework, in turn, serves to help shape the user’s thought process, especially regarding risk assessment. A limitation is the potential for one or two aspects to disproportionately skew the overall numerical risk level. The reader must recognize this possibility, and adjust accordingly. Further, the reader is expected to utilize the information herein as a basis for further research, upon proper identification of the firm’s most prevalent risks. While the paper considered a broad review of literature, some adverse implications and mitigation approaches received more attention than others.

In conclusion, if the key to business success is superior efficiency and effectiveness relative to one’s competitors, and the globalization of markets provides internationalizing firms the opportunity to augment these factors, such firms must give proper attention to the risks prevalent in international business, not least of which is the country risk of terrorism.

<table>
<thead>
<tr>
<th>ONRL</th>
<th>Suggested Response Level</th>
<th>Recommended Action</th>
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<tbody>
<tr>
<td>25-30</td>
<td>Intensive</td>
<td>Allocate significant resources to address.</td>
</tr>
<tr>
<td>20-24</td>
<td>High</td>
<td>Identify highest risk areas to address.</td>
</tr>
<tr>
<td>16-19</td>
<td>Moderate</td>
<td>Conduct cost-benefit analysis first.</td>
</tr>
<tr>
<td>12-15</td>
<td>Low</td>
<td>Consider based on available resources.</td>
</tr>
</tbody>
</table>
| 0-11 | None                     | Negligible risk level - no action required.
The International Business Risk of Terrorism

References


The Uncatchable Crook: Pursuing Effective State Crime Control

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Michalowski (2013: 2010) asks, “Can a legal apparatus designed by powerful capitalist states address the social harms, particularly the systematic social harms, committed by those states?” Essentially, this concern is over the prevention of state, corporate, or state-corporate crime. As criminologists develop theories to explain crime, they also ostensibly strive to prevent crime; they may ask, “What good is a theory of crime, if it does not imply some successful prevention?” Crime prevention may well be the most important component of a criminologist’s job. The fundamental problem with crime prevention occurs when searching for solutions. When addressing crimes of the state, popular solutions derived from criminology may not be applicable since the state imposes crime solutions. For instance, the United States incarcerates more individuals than any other nation—but how does a state incarcerate itself for a crime it has committed? When investigating state, corporate, and state-corporate crime, researchers conflict on the solutions to such crimes. While it is conventionally understood that the state can regulate itself through various mechanisms of checks and balances, researchers such as Michalowski (2013) exclaim that any such crime prevention is doomed to fail unless it resonates outside of the state. Here lies the pertinent controversy of how to prevent crimes of the state, when traditionally, the state has been the major mechanism by which to address crime.

This paper will highlight this controversy and describe how U.S. state crime is unique in that the U.S. holds such a powerful position in the world, allowing it to ignore many of the crime controls effective for preventing crimes of less powerful states. After demonstrating the difficulty of preventing state crime, this paper will review some of the theoretical and empirical
literature of mainstream and critical criminology to gather various ways to address state crime.1 The major novel contribution of this paper is to apply theories of street crime to state crime in search of unique ways to potentially address state crime.2 Lastly, this paper will briefly discuss a methodological suggestion, informed by mainstream criminology, of how to decipher the most effective prevention methods of crime. The importance of finding solutions to U.S. state crimes (or those of other powerful nations) cannot be overstated, and should be a mission for future criminologists, because it can lead to serious social harm such as torture, political imprisonment, extrajudicial killings, and enforced disappearances (Blum, 2004). Since the majority of criminologists spend their time studying street crime, this paper seeks to apply their conventional wisdom of controlling crime to the difficulties of state crime.

Definition of Crime

It seems that traditional criminology naively assumed that the state, as the main component used to curtail crime, could not commit crime itself. Of course, if an act or series of acts were not defined as crime, then there would be no apparent reason to rectify, punish, or address those acts. Thus, the debate over how to define crime is a prerequisite to addressing said crime. For the sake of this paper, crime is defined as a “blameworthy harm.” Agnew (2011) discusses the ambiguity of blameworthy harm. Harm is, to a certain extent, based on the discretion of the researcher. Agnew explains that harm can be more precise when using human rights as an indicator, which Fagan describes (2005:1) as “the necessary conditions for leading a minimally good life.” A blameworthy harm is most commonly described as being “avoidable,” “preventable,” or “unnecessary” (Agnew, 2011). Since the debate over how to define crime is another vast controversy, which this paper cannot address at length, understand that "crime" as used throughout the paper refers to blameworthy harms. The reason against using international law as the defining doctrine of crime will become apparent throughout the paper.

The Controversy

The controversy over how to prevent state crime is more complex than the choice between state reforms or intervention that comes from outside the state. Even the most well-versed scholars of state crime tend to debate themselves or offer recommendations from both sides of the argument. Michalowski and Kramer’s (2006b) integrated theoretical model of state-corporate crime is one of the most sophisticated theoretical models dedicated to explaining state-corporate crime. In their comprehensive model, there are three levels of analysis and three catalysts for action. The three levels of analysis include institutional environment, organizational, and interactional, which correspond with the macro, meso, and micro levels of analysis respectively. The three catalysts for action include motivation, opportunity, and control, which are akin to an accumulation of many traditional criminology theories. All of these catalysts are considered potential causes of
state-corporate crime. Within this theoretical framework, it is hypothesized that having several intense motivations, access to opportunities to commit crime, and lax controls will lead to a greater likelihood of the commission of state-corporate crime. Therefore, this paper shall focus on the control element, as this directly implies various methods for crime prevention if the control components are strong.

Of the eighteen control mechanisms listed by Michalowski and Kramer (2006b), only one or two can be considered state solutions. Legal sanctions are the one control mechanism most akin to a state solution, in which some state regulatory agency imposes a legal sanction on the state itself. However, legal sanctions are more commonly imposed when a corporation is the offender, not the state itself. More likely, an international legal body would advocate for a criminal state sanction. Similarly, the other control mechanism that could potentially be generated by the state is international reaction. Polls of citizens around the world constitutes one part of international reaction, but international reaction can also constitute state reactions globally. However, international reaction tends to have very little effect on controlling state crime. For example, international polls before the Iraq War demonstrated that nearly all citizens of the world outside of the United States opposed the invasion of Iraq (Pew Research Center, 2003). Furthermore, the invasion of Iraq was a violation of the United Nations (UN) charter, and despite UN opposition, the United States uninhibitedly engaged in a war in Iraq (Kramer & Michalowski, 2005).

Some of the most prolific state crime scholars struggle with addressing crimes of the state. On the one hand, they declare that international law and agreements are either ineffective or established in favor of the United States, and on the other hand, simultaneously, they suggest that strengthening international law may be the course of action to prevent such crimes (Kramer, Michalowski, & Rothe, 2005). Focusing solely on U.S. state crimes, Peter Iadicola (2010) struggled with a similar conundrum. He offered three solutions to U.S. state crimes, one involving the UN, stating that it may be the most capable of holding the United States accountable for its crimes. Although he does articulate that any successful solution is likely to include efforts from both governments and civil society, he fails to mention the construction of the UN as primarily a diplomatic tool for the global powers including the United States. Kramer et al. (2005) suggest international law as a solution, but do not miss the fact that the United States exudes such dominance in the UN. They mention the U.S. rejection of the International Criminal Court (ICC) as well as the veto power bestowed to the United States, the United Kingdom, China, Russia, and France in the UN, which allows the dismissal of any allegations directed towards these countries. The ICC has been opposed by the United States in the past, only having been found effective in convicting relatively weak states, typically leaders of African nations (Rothe & Mullins, 2006). Consequently, the United States is virtually exempt from any conviction under international law. Despite these complications, many criminologists still advocate international law as a solution.

Interestingly, Ronald Kramer (2010: 128) criticizes international law for lacking "any effective enforcement mechanism." Compare this to a
scenario in which U.S. law existed as it stands today, but the police force along with the majority of the criminal justice system was removed. The result would likely be that illegal behavior would occur, but no corrective or retributive action could be taken since no law enforcement agency would exist. A situation much like this currently holds for state crime. The United States commits state crime but with no state crime enforcement agency, no punishment is ever meted out. Kramer concludes that international law has normalized several state crimes, specifically the bombing of civilians. To understand what it means for a crime to be normalized, take the example of spitting on the sidewalk. Spitting on the sidewalk is an illegal act in many places, but if we recall the number of times we have seen someone else spit or we ourselves have spit on the sidewalk and the corresponding number of sanctions imposed when such actions have occurred, we likely would recall a very lopsided number. It is not uncommon that someone has spit on the sidewalk several times without ever facing reprimand, much less a formal sanction. Over time, individuals become socialized to the understanding that spitting on the sidewalk is not a terrible act and even acceptable to some degree. In a similar vein, Kramer (2010) argues that since the United States never faces any sanctions for their crimes, they become accustomed to committing crime and accept such atrocities as normal.

Bruce Arrigo (1999) explores the controversy in a unique way by focusing not on state crime, but on crime in a more general sense including street crime. Equipped with a critical criminological lens, he investigates how to achieve social justice, which, of course, is the goal of any criminologist presumably. He claims that although criminal justice has been a major focus of both mainstream and critical criminologists, social justice is often times neglected with little mention in the literature. Despite much explicit discussion of social justice, critical criminologists have situated it as an essential goal of any criminal justice system. Many times their critiques of the criminal justice system underline the social injustice perpetuated by the criminal justice system.

Overall, Arrigo (1999) concludes that the criminal justice system is a reactive edifice to behavior deemed by greater society as deviant. However, the criminal justice system is ill-equipped and incapable of promoting, fostering, and maintaining social justice. The criminal justice system, in its present configuration, will inevitably generate vast inequalities. Consequently, social justice and criminal justice are deemed incompatible and “fundamentally opposed to one another” (Arrigo, 1999: 270). In order to achieve social justice, radical changes are necessary in the criminal justice system. Although it is already in question if state crime can be addressed by the state, Arrigo and several other critical criminologists have taken this inquiry a step further to ask if the state, at least in the form of the criminal justice system, can be effective in preventing crime in general, including street crimes, corporate crimes, and state crimes.

Difficulties in Preventing State Crime

At this point, the controversy revolves around the options of preventing state crime, and whether the solutions to preventing state crime should
come from the state or outside of it. For the rest of the paper, the focus is not on state crime in general, but rather U.S. state crime because the U.S. holds a uniquely powerful position internationally, which differs from most states and makes it considerably more difficult to hold the U.S. responsible for its crimes.

The United States actively attempts to circumvent international law. International law is viewed as a threat to the United States and is something to be persistently disregarded (Bartholomew, 2006). A National Defense Strategy Doctrine created by the Bush Administration reveals explicit negligence for international law. It states the need for the U.S. government to maintain complete autonomy and “global freedom of action” to use any measure in order to secure U.S. interests (U.S. Government, 2005). Furthermore, it discusses international conventions as a challenge to the United States, pitting the United States against the world. If the United States only accepts international agreements that are nearly one-sided, it is unlikely that U.S. state crimes can be alleviated via such international laws.

Some famous Presidential doctrines exemplify the United States' struggle to be ungovernable, and yet the ultimate rule makers of the world. Thomas Jefferson's doctrine applied directly to the Native Americans at the time of the country's founding and implied that the only way to avoid trouble with neighbors is to dominate them (Williams, 2007). Early on, the United States emphasized security over diplomatic foreign policy. Instead of engaging in a cooperative effort to coexist, the United States historically adopted an imperial orientation. The Monroe Doctrine later demarcated the boundaries of U.S. jurisdiction by declaring that North and South America were off limits to any European powers; and if others did not heed this warning, they would face grave consequences (Sexton, 2011). More recently, the Bush Doctrine has expanded these borders by allowing complete U.S. discretion to declare war based on the reasoning that pre-emptive war against terrorist nations is justified (Renshon & Suedfeld, 2007). These doctrines taken together demonstrate U.S. imperial ambitions and neglect for the sovereignty of other nations as well as international law that disallows such proactive aggressions of war.

Not only has the United States decreed by doctrine their imperial ambitions, it has also historically neglected international authority. Nicaragua v. The United States is a paramount case when highlighting the failures of international law on controlling U.S. state crime for two reasons. First, it is the only case of state crime committed by the United States taken to court to date that concluded with a guilty verdict (International Court of Justice, 1986). The World Court of Justice (later known as the International Court of Justice) found the United States guilty on several accounts of state crime, most notably the sponsoring of terrorist acts that attempted to overthrow Daniel Ortega and the Nicaraguan government. In this case, the United States executed an overthrow to preserve U.S. interests and maintain unilateralism. As the only international court case to deliver a U.S. guilty verdict for state crime, this case paints a picture of the United States as an unlikely court defendant. One may wonder – if the United States has not committed many crimes, then wouldn't few convictions be warranted? Although the focus of this essay is not to demonstrate the various crimes committed by
the United States, this paper does identify a few examples. William Blum's (2004) hefty book addresses (illegal) U.S. military interventions since World War II (WWII), a list that is quite extensive despite the brief time frame. With the vast number of crimes committed by the U.S. and only a single conviction, the efficacy of international courts must be questioned. Not only should we address this issue historically, but also with an eye toward the future of addressing state crime, particularly crime committed by states as powerful as the United States.

Second, and perhaps more importantly, despite the International Court of Justice's conviction, the United States faced no punishment after Nicaragua v. The United States. Initially, the United States denied the jurisdiction that the court had over them and did not acknowledge the trial, emphasizing state sovereignty over any international authority. Imagine a murderer skipping his day in court and announcing to the courts that they have no right to prosecute him. Such a scenario is hard to imagine, because the murderer would likely face an even harsher punishment after his defiance. Yet, in the case of the United States, its immense international power was reason enough to avoid sanction. Such a global power imbalance is quite the obstacle when addressing state crime, a non-issue when addressing mainstream crimes (e.g., FBI index crimes) or even when addressing state crime committed by less powerful states. Even more foreboding when considering how to control U.S. state crimes, this case was later completely dismissed. Nearly five years after the conviction, a U.S. sponsored candidate took office in Nicaragua and retracted the U.S. conviction. Thus, the only conviction faced by the United States ended in a complete exoneration of guilt; thereby, the conviction could be forgotten, not only in American history, but among other countries more critical of the United States as well.

Using Theory to Prevent State Crime

Despite the differences between state and street crime, it is also important to understand that they are both crime in the sense that they are blameworthy harms. Thus, when using theory to engender crime prevention methods, the strategies for preventing street crime offered by mainstream and critical criminologists should not be hastily abandoned. In order to address the apparently unsolvable dilemma of addressing state crime, theories explaining street crime may actually shed some light.

Neighborhoods and State Crime

Building collective efficacy in neighborhoods may be an essential step towards curbing state crime. Collective efficacy is defined as the ability of community members to control other members' behavior (Sampson, Raudenbush, & Earls, 1997). Of course, if the state is the object of control, then this efficacy must be expanded to allow for the control of an outside force. Given that many criminologists discuss the need for grassroots movements to address state crime, it could be helpful to turn to criminological theories concerning neighborhood level variables allowing for collective efficacy. If neighborhoods are disorganized in the sense described by social
disorganization theories (Shaw & McKay, 1942), then it is unlikely they could collectively challenge the state when they're unable to control crime in their own communities.

Bursik and Grasmick’s (1993) model incorporates three levels of community social control including the private, parochial, and public. The most basic form of control exerted by the neighborhood is at the private level. Groups within the neighborhood initiate this form of control. These groups address criminal behavior by allocating social support or threatening to remove it. The private level refers to friends or like-minded neighbors of the criminal. The parochial refers to acquaintances in the neighborhood who do not have sentimental attachments. Local institutions in the neighborhood such as stores, schools, churches, or voluntary organizations exert parochial forms of social control. Lastly, the public level of social control includes institutions found outside the neighborhood. The ability to secure goods, services, and support from agencies outside the neighborhood is essential. Paramount to the public level of control is the relationship between neighborhood residents and the police department. This last form of social control is problematic since it is heavily reliant on the state. However, this does not necessarily have to be the case. Instead of securing resources for state-based institutions or the police department, neighborhoods may secure resources from non-governmental institutions and most essentially from wealthier neighborhoods with similar causes.

Criminologists interested in the neighborhood level of control often overlook agency. For instance, Sampson (2012) identifies himself as a structural determinist, but adds the caveat that individuals are also important. Despite this recognition of individual importance, little of his study actually investigates the individual’s influence on the neighborhood. Sampson would likely argue that neighborhood change could be brought about through civic engagement and activism. However, both of these influences are discussed as structural outcomes of neighborhood characteristics. He describes a scenario when he ran into a protest group at the corner of a street, and he seemed to assess such action as a step towards change through agency. This begs the question: does such protest arise only when neighborhood circumstances allow for such action? If we assume the answer is no, neighborhoods may be the spawning grounds for grassroots organizations capable of challenging the state by improving collective efficacy. The importance of social movements in controlling state crime will be the subject of later discussion in this essay.

Using the State Against Itself

The most intriguing advice offered by Bursik and Grasmick (1993) is to incorporate gang members as part of the solution to gang crime and violence. A program that offers gang members the voice and opportunity to legitimate means can gain valuable insights from individuals who have actually committed similar crimes. With this “insider information,” a more apposite crime prevention program could be implemented. Similar to businesses and governments hiring cyber criminals to create security software to ward off hackers, these programs use the criminals themselves to
develop a prevention program that addresses the motivations for committing such crimes and any opportunities for its commission. Using this logic, ex-military generals, politicians, and government employees are invaluable resources to any state crime prevention program. For instance, John Perkins (2004) wrote an exposé about working for an international consulting firm that collaborated with the International Monetary Fund and World Bank. He discusses the several crimes (in his words) committed by these organizations. The book itself helps to inform individuals on state crime, but someone like John Perkins could be instrumental to devising plans for the prevention of state crime.

**Parenting, Schools, and State Crime**

Both Hirschi (1969) and Gottfredson and Hirschi (1990) argue that interventions are necessary in parenting and the school system. Although state crime was not the focus of Gottfredson and Hirschi's (1990) self-control theory of crime, their general theory may apply to how to reduce state crime. They argue that crime can be reduced to the trait of low self-control, and that this trait is developed in the early stages of life due to poor parenting. The minimum standards for good parenting and for instilling values of self-control in a child are: (1) parents must monitor their child; (2) they must recognize when deviant behavior occurs (or, when low self-control manifests itself situationally); and (3) behavioral episodes exhibiting low self-control must be punished by the parent. Although state crime is understood to some extent as organizational crime, individuals are also integral in the occurrence of state crime. For example, during WWII, the U.S. military firebombed the city of Tokyo, which resulted in over 185,000 casualties (Tirman, 2011). These bombings were executed under the authorization of General Curtis Lemay who verbalized the strategy behind the excessive bombing of Tokyo by stating, "bomb and burn them until they quit" (Pape, 1995:92). With a person in a position of such power behind state crime, mainstream criminology can help to explain and prevent such individual behavior. General Lemay's quotation paints a picture of an angry man who might have lost self-control. Parenting classes addressing Gottfredson and Hirschi's standards for good parenting may help reduce state crimes of such nature.

Research on children and corporal punishment has revealed that the use of corporal punishment in childhood is associated with increased aggression (Gershoff, 2002). Although such aggression is thought to manifest in violent street crimes, it may also lead to violent state crimes such as the Tokyo bombing. Much of the country is worried about the "sadist in the bushes," but what about a sadist in the Oval Office? Mark Colvin (2000) suggests a "nationwide parent-effectiveness program." Parents would enroll in classes that teach them how to discipline their children in a non-coercive manner, free of physical discipline, that maintains consistency and avoids humiliation.

Schools provide a unique challenge when considering state crime, because most schools are publicly run with the curriculum mandated by the government itself. Any policy that would take place in public schools would
first have to come from the state. These policies would likely not be effective at addressing state crime for this reason. Instead, once collective efficacy can be established in neighborhoods or larger communities, the communities should play larger roles in education since education is linked to crime in many mainstream criminology theories (Hirschi, 1969; Gottfredson & Hirschi, 1990; Bursik & Grasmick, 1993; Sampson, 2012). It would likely take a grassroots organization to mobilize an effective school system of this nature.

Strain and State Crime

The American cultural ethos represented by the idea of the "American Dream" promotes criminogenic norms by which individuals are reinforced through socialization to adhere to a strong drive for economic achievement (Messner & Rosenfeld, 2013). There are four essential foundational values attributed to the American Dream. First, people are motivated to be goal-oriented and aspire to the highest reaches of speculation (i.e., achievement). The approval of competition in the United States far surpasses that of any other industrial nation. The outcome of these aspiring goals typically defines the worth of an individual. Second, individual rights and autonomy are of the utmost importance (i.e., individualism). Individuals are often left to fend for themselves as solo competitors against their community members to validate personal worth. Third, the American Dream and its culture have massive influence over nearly every member of society, thus few are able to escape the pressures of individual achievements as indicators of inherent worth (i.e., universalism). Fourth, success in America is nearly universally defined by accumulation of wealth, both material and monetary (i.e., materialism). Other nations are materialistic to a similar degree; however, the U.S. uniquely uses money as a quantitative metric of success.

Contemporaneously, social structure influences crime in America as well. Four social structures are highlighted in Messner and Rosenfeld’s (2013) version of anomie theory: economy, polity, family, and education. The authors postulate that high crime is a result of the power imbalance of these four social institutions. The economic system dominates these other realms of society through three interrelated ways. First, noneconomic goals such as family responsibilities, learning, or voting are devalued and viewed as means to an economic ends rather than valued for any inherent worth. Second, various accommodations are made for economic incentives in the specified other social institutions. For example, family obligations are likely to be secondhand to economic or professional responsibilities. Third, the economic sector penetrates the other institutional domains. For instance, politicians propose to run the country like a business with “bottom-line” rationality, and testing becomes more important as an outcome than learning in schools. Ostensibly, these same forces drive U.S. state crimes, similar to the effect of these forces on individual crime, according to Messner and Rosenfeld.

Both liberal and conservative policy recommendations will not be able to reduce the high level of serious crime (including state crime) in the United States. Instead, two overarching approaches must be adopted to deal with
the cultural and social structural circumstances responsible for high crime levels. First, great lengths must be taken to strengthen the noneconomic sectors of society (i.e. family, education, and polity) while simultaneously reducing the stranglehold of the capitalist free-market mentality of economics to rebalance social institutions. Second, cultural regeneration must occur that addresses the criminogenic nature of the American Dream. Such a goal can be accomplished by devaluing financial success as the only form of validating self-worth, reducing the emphasis on individualism, and replacing individualism with a community commitment and collective goals. These two suggestions derived from Messner and Rosenfeld’s (2013) work should help reduce individual competition and strengthen the sentiment of community, leading to a stronger foundation for the type of social movements needed to challenge the state.

Collective Action and Other Critical Crime Approaches

The neighborhood or community’s collective efficacy is likely one prerequisite to building a strong grassroots movement capable of challenging the state. Likewise, grassroots movements are likely a prerequisite to a successful parenting or school program devoted to preventing state crime via the ways discussed above. Iadicola (2010) describes what these movements might look like specifically. The examples in his paper include a massive global demonstration occurring in over 500 cities worldwide consisting of approximately 30 million people against the U.S. invasion of Iraq, ubiquitous efforts to resist U.S. military bases in various countries around the world, war tribunals outside the jurisdiction of international law in investigation of myriad state crimes, and a multinational banding of critical international lawyers to reconstruct law.

In addition, technology has allowed for new ways of fostering collective action unavailable before. Physical congregation is no longer essential to protest a social injustice. DeKeseredy (2011) realizes the potential of social networking sites such as Facebook and Twitter for giving the oppressed and disenfranchised an outlet to be heard, disseminating electronic petitions, organizing physical demonstrations, inoculating people against the misinformation of the media, and coordinating corporate boycotts. Iadicola (2010) also points to boycotting as a way for a collective of individuals to circumvent the power of corporations by affecting their bottom dollar.

Reducing social inequalities is the goal of many critical criminologists as outlined by Arrigo (1999). Efforts to restructure the economy by raising the minimum wage to a livable wage; reducing unemployment and underemployment by adopting a Keynesian economic philosophy dedicated to full, quality employment; eliminating temporary work agencies (at least as they exist now); strengthening unions; nationalizing health care and retirement plans; and increasing spending for pre-school education, child-care facilities, and affordable housing can be effective in reducing social inequalities. Although the government may need to implement these policies, the alleviation of social inequalities will provide the foundation for more collective neighborhoods and stronger grassroots movements, which then allows citizens to challenge the state’s international criminal behavior more effectively.
Messner and Rosenfeld (2013) and DeKeseredy (2011) describe the social Darwinist ideology present in the United States. Citizens are pitted against each other in harsh competition in nearly every facet of life. Furthermore, Klein (2012) demonstrates that U.S. citizens are in favor of an aggressive warmongering state, thus perpetuating state crime. Cultural criminologists explore the way symbolic imagery and messages shape individual lives and build understanding (Ferrell, Hayward, & Young, 2008).

Given the cultural environment conducive to allowing or neglecting state crime, the media may offer an outlet to reverse these cultural trends. Collective action to create publicly owned media, in contrast to media owned by major corporations, is probably a good first step. Typically, the difficulty for these alternative forms of media is in reaching large audiences, but they are likely to become more effective as social networking and media grows. DeKeseredy (2011) describes the importance of building a “culture of support” that reintegrates transgressors instead of stigmatizing them, similar to reintegrative shaming theory (Braithewaite, 1989). Reintegrative shaming could be adopted for international crime as well. More importantly, this culture of support should deemphasize fierce competition and attempt to establish a partnership or collaboration of effort that not only unites the country but the world as well. However, the strong cultural influences present in the world today will likely be the main obstacle to changing the culture itself.

**Method for Finding The Best Solution to State Crime**

To determine which of the various potential control mechanisms may be most effective in addressing state crime, a comprehensive evaluation study similar to those done with mainstream crime control policies would be the most fruitful. Of course, a major evaluation study like this would face several unique obstacles and would only uncover the effective strategy that has actually to some degree been implemented already. Therefore, an evaluation study of state crime control may look quite different from its mainstream counterpart.

In order to understand what such a study would look like and to outline the unique obstacles aforementioned, the recommendation of nationwide parental-effectiveness teaching courses will be used as an example. Keep in mind, each recommendation mentioned above can be evaluated in a similar way and the nationwide parental-effectiveness teaching course is just an example. Since it is unlikely that a researcher would be able to implement such a policy to study its efficacy at alleviating state crime, a comparative evaluation study would most likely have to compare state-corporate crimes of nations that have such a policy to those without. If no country has implemented this policy, it would be virtually impossible to test its effectiveness empirically. Therefore, any comparative evaluation study would be limited to recommendations that have already taken place.

Another essential obstacle relates to the difference between U.S. state crime and another state’s crime. As mentioned earlier, the United States uniquely possesses global power unparalleled by most states, and thus a comparative study between the United States and other countries may not provide any applicable findings. For example, if a study concluded that state
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Crimes decreased in Rwanda while remaining stable in the United States, and Rwanda had a nationwide parental-effectiveness program and the U.S. did not, one could not simply conclude that the United States could reduce its state crime if such a program was implemented. Regardless of how such a program is implemented, it is important to note that U.S. state crimes and Rwandan state crimes are not the same. While the United States has global power to harm the citizens of sovereign nations such as Pakistan or Oman, Rwanda is notorious for its genocide in which its government played a role. Thus, the results of such a study may really only show that the parenting courses are effective in eliminating state crimes of a “weak” state rather than one as powerful as the United States. To simplify the analysis, the outcome variable should be limited to a specific type of state crime that can be operationalized, such as manipulation of global currencies or killing of foreign citizens. The United States, being a unique global power, should only be compared with similarly positioned nations such as the United Kingdom, France, China, or Russia, and even then should be considered with great caution.

In regards to the dependent variable, state crime has no clearance rate or crime rate, unlike conventional crime evaluation studies. Although limiting the dependent variable to a single type of state crime will help mitigate this issue, it is still no easy task to calculate the amount and/or severity of state crime(s) that have occurred, especially considering that the study must cover a substantial duration of time in history, such as a decade, to reveal if the state crime solution has effected change or not. Given the amorphous subject material, quantitative studies most likely will not fit the bill. Case studies are already the dominant research method in state crime (Michalowski & Kramer, 2006a), but few of them qualitatively evaluate solutions of state crime. As previously discussed, more than one case is necessary to evaluate a solution’s effectiveness, but the documentation of information can follow a similar qualitative format as most case studies have done with state crime.

Lastly, since historical methods are likely preferred, there are several issues with accumulating or acquiring data - be it quantitative or qualitative - on state crime that make research more difficult. With the state’s power of censor, corporate and government records are commonly missing data points (Tombs, 1999). In addition, archival information frequently has entire sections missing (Berg & Lune, 2011). Information placed in archives depends on a subjective decision as to what information is considered essential and germane (Hill, 1993). When qualitative or quantitative studies with small samples are prominently utilized, missing data becomes an exponentially threatening problem. Consequently, only partial information is available, severely limiting what data can be analyzed. The paucity and nonexistence of dedicated databases to state and corporate crime further complicates data retrieval (Rothe, 2009). Whereas conventional crime researchers have several databases dedicated to their particular research focus, these databases are resources that state and corporate crime researchers must proceed without.
Resolving the Controversy

Deciphering effective ways to reduce or eliminate state-corporate crime may not allow for any major advancement into the study of state crime. It will however allow for criminologists and practitioners to move forward in attempting to address the crimes in existence. Addressing state crime is not an easy feat, and certainly there is much work to be done. Once potentially effective strategies for limiting state crime are identified through the method discussed above, the likely next step involves identifying how to implement strategies to curb state crime when the state is unlikely to submit passively to such demands or restrictions. Identifying effective control strategies is half the battle, but the truly arduous task comes after. Once there is an understanding of how to control state crime, individuals must act despite the many constraints they are likely to face against a state unwilling to change. Sacrifices must be made if major reforms to a criminal state are to take place.

It should not be surprising that the conclusion to this essay is fairly depressing. The resolution of the defined controversy is a small step towards putting an implementation in place. And yet, a long struggle is ahead before even that small step can be taken. That struggle, of course, has been outlined throughout this paper. Yet, theories of street crime may actually help advance this struggle. Although it might be appealing to many criminologists to dismiss the task of controlling state crimes as too daunting, this paper hopefully contributes to making state crime control more feasible.
Notes

1. Mainstream and critical criminology is a commonly assumed distinction for criminologists. Agnew (2011: 2) defines mainstream criminology as a “focus on acts that are in violation of the criminal law, particularly individual acts of violence, theft, and drug use”, whereas critical criminology “focus[es] on a much broader range of ‘crimes’ than mainstream criminology, including acts that are not in violation of the criminal law,” such as the acts of states, for instance.

2. Street crime is the category of crime that mainstream criminologists mostly focus on, including crimes against persons (e.g., assault, battery, homicide, domestic violence, and robbery), crimes against property (e.g., burglary, arson, auto theft, shoplifting, and vandalism), and drug crimes. State crime, on the other hand, refers to crimes committed by a government or government agency (e.g., genocide, torture, and aerial bombardment of civilians).


4. A structural determinist views social structure, in this case, as an overlying factor that deterministically affects outcomes and processes. In other words, people placed within a particular social structure will follow predictable processes to predicted outcomes with little to no influence on those processes and outcomes due to actual human autonomous behavior.
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Emerging onto the literary scene in the late 1820s and early 1830s, Nathaniel Hawthorne sought to distinguish his style as unique from that of his predecessors. In so doing, he developed a style of writing that emerged as something completely different from the norms of the time, but also became a new standard against which American authors could be measured and through which they could be deemed of equal value to their European counterparts. His mode of writing embraced such conventions as are evident in the British Gothic, but it also contained a truly original dynamic that expressed Gothic imagery in ways that had not yet been observed on the international scene. Reflecting upon the source of this imagery directs one’s attention to some of Hawthorne’s earlier works, particularly his often variably-defined story “My Kinsman, Major Molineux.”

The Emergence of the Theme

Prior to Hawthorne, there were very few Gothic stories or novels published by American authors. The genre was largely a European one, with the strongest influence residing with the British. The thoughts and opinions of those particular authors were inextricably woven into the plotlines of their stories, setting the dominant tone of the genre as culturally their own. Dominant themes included settings in “antiquated or seemingly antiquated” spaces, instances of extreme isolation, struggles between power and submission, anti-foreign/anti-Catholic/anti-“other” sentiments, and scenarios set in periods that combine the modern with the ancient (Hogle 1; Gamer 86).

Homegrown American authors, such as Nathaniel Hawthorne, brought a unique perspective to the genre, lending the new “American Gothic” a flavor
all its own. Playing upon the last theme mentioned above, Hawthorne was very fond of casting a critical eye on the past to make observations regarding America's colonial forefathers, particularly those of Puritan ancestry, and the way they went about structuring their new country. "Modern" perspectives often clashed with the "ancient" ones possessed by those who had come before Hawthorne's writing. Of particular interest is the allegorical short story "My Kinsman, Major Molineux," which was published in 1832, but set in a period well beforehand, when what is now known as the United States was facing imminent rebellion against royal rule, followed by the declaration of, and subsequent war for, American independence. Although critics are divided as to whether the story is set in the 1730s or 1760s, there is no doubt that rebellion was set firmly in the minds of the many colonists Hawthorne depicted.

In this tale, a youth, "one of whose names was Robin," has taken a journey of some distance from his rural origins to "the little metropolis of a New England colony," home to a relative who has offered to give the boy some assistance in beginning to make his way in the world (Hawthorne 69). After a series of bewildering encounters with the townspeople and eventually the Major himself, Robin declares his intent to return home but is gently delayed in doing so by a kind stranger who suggests he look into making his own way in the world (87).

While this story certainly seems like a straightforward example of the proverbial country boy vs. city boy or "new world" politics vs. "old world" politics motifs and all that they symbolize, there is a much richer dynamic waiting to be extracted. When one considers the multifaceted approach taken in this story, "Major Molineux" could really signify the emergence of the American Gothic as a distinct and separate experience apart from the style of the earlier generation of British and European Gothic writers.

Keeping this idea in mind, a rich tapestry emerges of carefully constructed threads, which together weave a tale not just of American independence, but also of an evolved and separate American identity. Severing ties with the established norms and allegiances of yesterday, Hawthorne takes old conventions and turns them into something new, a genre that is rooted distinctly in the unique American culture.

What the American Gothic does for the Story

One element of the Gothic that is recognized as an American invention is the use of comic effect to relay a message. Consider the first description of Robin. The ferryman who brings the youth into town notes that he was "clad in a coarse grey coat...his under garments were durably constructed of leather...his stockings of blue yarn, were the incontrovertible handiwork of a mother or sister; and on his head was a three-cornered hat" likely originating secondhand from his father (69). The people of the village, however, are much more elaborately adorned, including one eminent figure "with a full periwig of grey hair, a wide-skirted coat of dark cloth, and silk stockings rolled about his knees," who carries a "long and well-polished cane" (70). When compared to the people he meets in town, with their elaborate dress, Robin is clearly viewed as a bit of a rube and worthy of their ridicule.
Hawthorne then uses his narrator to “expose and mock Robin’s personal weaknesses, idiosyncrasies, simplistic rationalizations, and bad judgments” for the benefit of the reader (Piacentino 85). Initially it seems as though Robin is not one to be taken seriously. However, that perspective does shift over time. In fact, “Robin's disillusionment seems to suggest a hopeful future,” which is a definite contrast when compared to many of Hawthorne's other characters (White 217). Perhaps this suggests the gradual coming of age of the American Gothic as something first considered a novelty, a lark, but later recognized for its more meaningful contributions.

In the 1800s, Europe was still viewed by Europeans and European Americans as the artistic mecca of the world, featuring more expression of the arts than virtually anywhere else, including painting, sculpture, literature, theater, and fashion. Indeed, no European of the day would be caught dead adorned in such simplistic array as the endearing Robin, due to the belief that clothing literally “made the man” according to European social custom. By depicting his hero as a rather stereotypical, basic young man of the time, Hawthorne draws attention to the richness of the townsmen’s fancier garb, which followed the models of European fashion even in these new environs. Although technically more spectacular to the eye, their clothing makes little sense in the setting of early America, reminding one of a peacock in the midst of the humble turkey's domain. This was the perception of many Americans at that time who favored freedom of choice and simplicity over royal rule and even the dictates of fashion. Hawthorne subtly draws attention to this separation of identity by making simple comparisons between clothing.

Major Molineux, the subject of young Robin’s search, is not revealed until very near the end of the story. Prior to this, the young man recounts to a stranger on the street the story of the Major, his cousin’s, visit to his father’s home. The Major, having “manifested much interest in Robin…was therefore determined that Robin should profit by his kinsman's generous intentions, especially as he had seemed to be rather the favorite, and was thought to possess other necessary endowments” (82). It was with this goal of inheriting success in mind that Robin journeyed to town to meet the Major. However, their introduction takes a disturbing turn when the elderly Major is at last paraded through town, victim to a perilous mob, a scapegoat for the despised elitist status quo that would no longer be tolerated. Although outwardly the Major seemed possessed of “a steady soul…steady as it was, his enemies had found the means to shake it” (85).

Just as the character of Major Molineux is representative of Europe and outdated ways of thinking, his type is also a useful metaphor for the established status quo in the Gothic genre at the time Hawthorne began publishing. The Gothic novel “exploded in the 1790s,” both in Europe and in the British Isles, but its chills and thrills were at first only enjoyed by the readers of the new United States rather than being authored by them (Hogle 1). While highly acclaimed Gothic works proliferated in Britain, the same fervor was not evinced by volume of publication in the U.S. Rather, American authors made their attempts individually before determining their course.

In order to appreciate the literary environments in Britain and America, it is useful to note that around the same time that Hawthorne was releasing
his first novel, *Fanshawe*, in 1828, Percy Bysshe Shelley had already published his *Zastrozzi* (1810), Mary Shelley was enjoying significant acclaim from *Frankenstein* (1818), and J. W. Polidori’s *Vampyre* (1819) had also been very well-received. As Hawthorne’s *Twice Told Tales* came out in 1837, he had to contend with the publication of Charles Dickens’ *Oliver Twist* that same year. The competition Hawthorne faced was tremendous. While authors are often examined in relation to their peers, it is nearly impossible to do so here. Hawthorne embodied a completely different breed of writer than what was present in Europe. When he could have shied away from the Gothic genre and looked to the success of his “sunnier” works, Hawthorne did the opposite. British authors were expected by their readership to publish remarkable and distinguished Gothic works due to their already established literary tradition. Very little was anticipated from the Americans, especially in the way of artistic expression, as they were viewed as a rather rustic and uncultivated population. However, rather than wilt in this atmosphere, Hawthorne blossomed by establishing a new identity for the American Gothic and treating the existing British conventions as antiquated when compared to the new experiences to be had in America.

Early American author Charles Brockden Brown explains, “new springs of action, and new motives to curiosity should operate; that the field of investigation, opened to us by our own country, should differ essentially from those which exist in Europe.” His directive may indicate that the later creative publications in the U.S. were attributable to the continued exploration of that dark and mysterious place, that new world, which surrounded them (Brown iii). He also points to the American shift away from “peurile superstition and exploded manners; Gothic castles and chimeras,” favoring more geographically relevant “incidents of Indian hostility, and the perils of the western wilderness” as far more suitable, stating his belief that “for a native of America to overlook these, would admit of no apology” (Brown iv).

In lieu of an ominous manor house or castle, Robin is “entangled in a succession of crooked and narrow streets, which crossed each other,” causing him to become slightly disoriented and ill at ease in his search for his kinsman’s home (70). Fumbling through the darkness, Robin perceives that “the streets were empty, the shops were closed, and lights were visible only in the second stories of a few dwelling-houses” (71). He is utterly alone and without resources in a strange and unfriendly place, similar to the experience of many early Americans who attempted to forge their way through remote terrain. Indeed, as Robin continues in his frustrating search, even the otherwise desirable attentions of a lady become bizarre and frightening. He is tempted by a “slender waisted woman, in [a] scarlet petticoat,” ostensibly the Major’s housekeeper, who “proved stronger than the athletic country youth” and had “drawn his half-willing footsteps nearly to the threshold” of a house of questionable repute, endangering the boy’s virtue at the very least (76). Hawthorne need not rely upon established European conventions to reach his American readers, who would have recognized in his simple environmental darkness a signal that danger might be lurking.

In a similar way, near the close of the story, the rising stir of the townspeople — with their cries emerging first as a murmur, then as a din, then as a deafening roar with the approach of the riotous crowd— carries with it an
ominous tone that indicates trouble is fast approaching. Despite the commonplace neighborhood, the unremarkable evolves into a twisted version of itself, and a bystander tells the nervous Robin, “you must not expect all the stillness of your native woods here in our streets” (82-83). In the wake of the approaching crowd, “a single horseman wheeled the corner in the midst of them, and close behind him came a band of fearful wind-instruments, sending forth a fresher discord, now that no intervening buildings kept it from the ear...The single horseman, clad in military dress, and bearing a drawn sword, rode onward as the leader, and, by his fierce and variegated countenance, appeared like war personified; the red of one cheek was an emblem of fire and sword; the blackness of the other betokened the mourning which attends them” (84). Robin is at first overwhelmed by what he sees, but he comes to see that he, too, might find a place for himself in this unusual new home.

Robin, serving symbolically as the American Gothic, embodies the change in perceptions that accompanied this paradigm shift in style. When he initially arrives into town, Robin possesses a firm belief in his own importance and elevated position in society due to his old-school beliefs and relation to Major Molineux, a man who has “inherited riches, and acquired civil and military rank” (81, emphasis mine). However, as the reader comes to find out, the townsfolk view Robin’s kinsman as someone who deserves far less than reverence, as he’s paraded in “tar-and-feathery dignity” through the city streets (85). At the very beginning of the story, Hawthorne indicates that “the people looked with most jealous scrutiny to the exercise of power, which did not emanate from themselves, and they usually rewarded the rulers with slender gratitude” (68). The inheritance or bestowal of privilege did not function in America the same way it did in Britain, as Americans were far more impressed with intrinsic values such as hard work, innovation, and independent thought than mere rights of appointment or inheritance.

Hawthorne adopts uniquely American elements to construct this tale of evolving separation. In early America, “the ideal of manly self-reliance and self-sovereignty gained pre-eminent authority...dislodging the...traditions of deferential hierarchy” (Herbert 21). Here is evidence that Hawthorne refuses to defer to tradition, instead contrasting it with the unusual setting and circumstances found in the colonial atmosphere. Whereas European authors utilized dark and foreboding castles for dramatic effect, in “Major Molineux,” Hawthorne favors a deserted cityscape at nightfall. In place of incarnate hobgoblins or monsters, we see the distorted features of a man’s painted face or the ominous forms of natives dancing by torchlight. Through the idea of “separateness” from the status quo, Hawthorne unlocks the door to an unlimited supply of original plotlines, twists, and turns rooted firmly in American design.

In further defining what exactly distances the American from the British Gothic style, it is useful to contemplate who is considered an “insider” and who is considered an “outsider” in the context of these works. When speaking to the experience of young Robin, it appears that he has been cast (at least temporarily) in the role of “outsider” when compared to the people he meets in his exploration of the new city. Remember his style of dress,
and then consider the dress of the other young men, or perceived “insiders,” that he meets. “Embroidered garments, of showy colors, enormous periwigs, gold-laced hats, and silver hilted swords” are worn by “imitators of the European fine gentlemen of the period,” which initially intimidates Robin, causing him to look upon his own plain dress with a sense of shame (74). However, just as the showy and highly acclaimed British authors garnered favorable attention initially by readers, the later efforts by relatively unknown American writers soon rose in popularity despite their lack of European flair. In fact, American Gothic writers would come to position themselves on the international writing scene precisely by distancing themselves from the British grandiose. And thus, positions reverse, and Robin the outsider is welcomed in.

Upon further consideration of this idea of “otherness,” it is useful to acknowledge that early Americans had formed an entire country of “others” and “outsiders” who did not fit neatly into the social strata that existed in their homelands. As a result, it only seems logical that they should take it upon themselves to shape and rend their art into something distinctive from what was embraced by their European forefathers, particularly if those forefathers elected to remain behind as continuing participants in the society they deemed prudent to vacate. This is especially true of those individuals who fled religious persecution, and potentially death, to establish a new civilization that embraced their unorthodox belief systems. Even people who did not have religious inclinations were attracted by the notions of free will, independence, and economic prosperity embodied by the new land they called home, values that were so in conflict with the hierarchical wealth and opportunity structure left behind in Europe. With an entire society following in the footsteps of that rebellious mentality, many in New England eventually sought to distinguish themselves as individuals, as “others,” without meeting the same skepticism and criticism as they would have met on their native soil. Or perhaps they merely succeeded in “othering” the British as foreign, and thus inferior to themselves.

This counter-culture attitude became extremely complex and convoluted over time, but in “Major Molineux” it is most notably evident when Robin’s very “otherness” becomes his most valuable asset, as the American colonists set out to wreak havoc on royal governors and other representatives of privilege in their quest for recognition as a self-sustaining entity. Emerging from the darkness came “a mighty stream of people,” while a “redder light disturbed the moonbeams, and a dense multitude of torches shone along the street,” and the young man stood by and watched (84). Although at first he had voluntarily offered up his connection to Major Molineux to anyone who asked, believing the Major’s wealth and position in society to be of positive regard to the townspeople, he comes to realize that he need not rely upon his kinsman to determine his fate. “As you are a shrewd youth,” says the gentlemen who befriends him (for the first time without irony), “you may rise in the world, without the help of your kinsman, Major Molineux” (87). On the same token, American authors, including Hawthorne, would eventually distinguish themselves as masters of the Gothic style without relying too heavily upon the established conventions that preceded them.
The Significance of "Major Molineux" as the American Gothic

Scholars have recognized "My Kinsman, Major Molineux" as an important and interesting piece of work that touches on many subtle themes churning beneath the placid surface of creative fiction. Critics have varied substantially in what they take away from the story, ranging from the modernization of New England to the establishment of the self-made man. While most agree that a definite and gradual metamorphosis was taking place at the time, it is the nature of this transformation that often leads to debate over interpretation. This essay’s argument differs in its elemental focus upon the emergence of the American Gothic style as a mode of writing (as well as drama and motion pictures later to come) that is distinctive from the traditional approach of the European Gothic style, and more particularly, Hawthorne’s British contemporaries. “Major Molineux” heralds a conscious and recognizable “beginning” for Hawthorne and for American writers to follow.

When Hawthorne first emerged as one of America’s first internationally celebrated authors, he was publicly perceived as a rather happy-go-lucky sort who crafted tales of amusement and wonder, including children’s stories. However, when his work was considered more deeply and extensively, themes of darkness emerged that fit much more closely with the Gothic style so prolific in Europe at that time. When viewing him as a catalyst for what American literature was to become, his value as a Gothic pioneer is immeasurable. It is difficult to imagine a world where the long-suffering Puritan, Hester Prynne, does not wield influence from between the pages of The Scarlet Letter, or where Young Goodman Brown does not challenge the devil in a walk through the woods. Offering useful insight into this often hidden side of Hawthorne’s personality, Herman Melville observed, “For spite of all the Indian-summer sunlight on the hither side of Hawthorne’s soul, the other side… is shrouded in a blackness, ten times black. But this darkness but gives more effect to the ever-moving dawn, that forever advances through it, and circumnavigates his world” (Melville 62).

This darkness, whether intended or not, has become an important asset in establishing the comparable facility of American authors on the international scene. When one recognizes the fact that the year 1800 was “the largest single year yet for number of Gothic novels published in England,” Hawthorne’s publication of his novels and collections of short stories some thirty years later puts him chronologically well after the initial pioneers of the genre (Hogle xix). However, once he begins to publish, especially upon release of The Scarlet Letter, he becomes a force with which to be reckoned, and an important forerunner in establishing the United States as a worthy adversary in the battle for literary eminence.

"My Kinsman, Major Molineux" was originally published in 1832 in The Token and Atlantic Souvenir, which encompassed works written in 1831 ("Tales and Sketches" 1472). Interestingly enough, documentation of Hawthorne’s own research suggests that he obtained much of his background information for "Major Molineux" from the 1819 publication of "Rees’ Encyclopedia," or The Cyclopedia, which he checked out from the Salem Athenaeum repeatedly in 1829 and 1830 (Bier 28). Jesse Bier posits that
in the “M” section, “the liberal 16th Century religious sect” of “Molinists” gave Hawthorne his “philosophic cue for the story” and that the Molinists provided Hawthorne “with an historical example and symbolic means of opposing hard doctrine thinking” (28-29).

The Molinists, followers of the Jesuit Lewis Molina, believed that “the operations of divine grace were entirely consistent with the freedom of human will,” and in new ways of removing “the difficulties attending the doctrines of predestination and liberty.” These beliefs were well aligned with the evolution of the American concepts of self-reliance and novel interpretations of the timeworn concepts of yesteryear (29). This also speaks to Hawthorne’s continued efforts to divorce the morality in his written works from that espoused by his Puritan forefathers, in addition to distanc- ing himself from established European literary traditions. The inclusion of this volume among the works Hawthorne read at the time of writing “Major Molineux” suggests that he ruminated on the emergence of independent thought at a period when he was also surrounded by the prolific influence of British Gothic authors, perhaps influencing his pen.5

It is especially thought provoking to connect the Molinists with the colonists who lived beside Major Molineux in their “little metropolis of a New England colony” (69). These colonists hold to a diverse set of religions and belief systems, heralding from many nations but also from many generations; some regard the “tried and true” as the best means toward prosperity and others wish to forge a new understanding of the same. Clearly those who espouse new ideas emerge triumphant, through the vilification or “othering” of those adhering to principles of the past, and also by taking a rebellious course of action both novel and defiant. Just as the colonists left their appointed leaders “few and brief intervals of peaceful sway,” the emerging ingenuity of American authors began a persistent encroachment onto the Gothic literary scene once dominated by the pens of Europe (68).

Regardless of the specific inspiration for “My Kinsman, Major Molineux,” the story has been recognized as an example of Hawthorne’s early success as a writer; only the story within the story remains up for debate. The dark and often humorous encounters of young Robin as he attempts to navigate a strange new place evoke the image of a young writer struggling to make his mark in a world of literary achievement that was not quite envisioned for someone like him. Hawthorne rose to the occasion, achieving not only personal success, but also blazing a trail for future writers to follow in his distinctive American Gothic style. His mingling of old and new approaches to thinking and writing, as well as his introduction of authentic colonial American ingredients, allowed for new introspection on what it meant to be distinguished as an American author.
Notes

1. Hawthorne's works were preceded by those of American authors Charles Brockden Brown, with his Wieland (1798) and Edgar Huntly (1799), as well as S. S. B. K. Wood's Julia and the Illuminated Baron (1800).

2. “The May-Pole of Merry Mount,” The House of the Seven Gables, and “The Gentle Boy” all come readily to mind, among others.

3. Andrew Loman offers an interesting economic and monetary theory in his 2011 article, “‘More Than a Parchment Three-Pence’: Crises of Value in Hawthorne’s ‘My Kinsman, Major Molineux.’” Also, Michael Cody’s 2012 article, “As Kinsman, Met a Night’: Charles Brockden Brown and Nathaniel Hawthorne as American Gothic Romancers” makes very useful connections between these two influential pioneers in American Literature. Lastly, Colin D. Pearce’s 2001 article, “Hawthorne’s ‘My Kinsman, Major Molineux’” gives valid insight into the “rites of passage” interpretation of this story.

4. Additional information on Hawthorne’s Gothic style is found in Maurice Charney’s 1961 article, “Hawthorne and the Gothic Style”; Neal Frank Doubleday’s 1946 treatise on “Hawthorne’s Use of Three Gothic Patterns”; Ronald T. Curran’s 1976 piece on the “‘Yankee Gothic’: Hawthorne’s Castle of Pyncheon”; and Monika M. Elbert’s observations in “Afterword: is Rome’s Moonlight Different From Salem’s: Hawthorne’s Reconceptualization of the Gothic” of 2012, none of which were appropriate for inclusion here.

5. Interestingly, there is an entry in The Cyclopedia just above that of the “Molinists” for a place called “Molineux’s Harbor” in New Zealand, which may have provided, whether consciously or unconsciously, the surname for which the story is so well known (Bier 29).
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Human-Nonhuman Chimeras, Ontology, and Dignity: A Constructivist Approach to the Ethics of Conducting Research on Cross-Species Hybrids

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Developments in biological technology in the last few decades highlight the surprising and ever-expanding practical benefits of stem cells. With this recent progress, the possibility of combining human and nonhuman organisms has become a reality, bringing into question ethical boundaries that are not readily obvious. These inter-species hybrids are of a larger class of biological entities called “chimeras.” As the concept of a human-nonhuman creature is conjured in our minds, either incredulous wonder or grotesque horror is likely to follow. This paper seeks to mitigate those worries and demotivate reasonable concerns raised against chimera research from the vantage of a combination of two commitments: Constructivism and capacity-based dignity ethics.

In service of this overall aim, first, this paper argues that chimeras are far less foreign and fantastic in light of recent lab research. Second, it argues that anti-Realist (so-called "Constructivist") commitments regarding species ontology render the species distinction (i.e., the divide between human and nonhuman) superfluous as a basis for ethical practice; this discussion draws from diverse views represented by Eberl and Ballard (2009), Badu-
ra-Lotter and Fangerau (2014), and Ludwig (2016). Third, it discusses some prevailing dignity accounts regarding the practical ethics of the creation, research, and treatment of chimeras. The goal of this essay is to show that the adoption of this particular set of views (Constructivist ontology, capacity-based ethics), in conjunction with recent research, ought to justify a parallel with what dignity we accord to human persons, and furthermore that the trajectory of chimera research allows for cases of moral permissibility.

The most obvious practical benefit of creating human-nonhuman chimeras is that through creating a *predominately nonhuman* organism we could be permitted to transplant *predominately human* vital organs. While the research is perhaps taboo, the dire need of hearts, livers, lungs, and other necessary organs is *prime facie* justification for proceeding. A common intuition is that animals do not have the same moral status as humans, but rather lower status, and therefore the use of their bodies as a means of growing vital human organs for the larger goal of saving human lives can be justified.

However, this presentation is too simplistic. As soon as there is talk of an organism that has animal *and* human parts, intuitions diverge regarding whether these organisms have moral status comparable or commensurate with that of humans. It is possible that they possess rationality or some other relevant capacities that make them *persons* or moral *agents*. Moreover, concerns over the ethical treatment of animals on grounds of suffering apply, if not to a greater degree, then equally to these organisms, since they are likely to be *moral patients*. That is, they are morally relevant since they can suffer, even if they cannot make ends for themselves, as Norcross argues (2004, 242-3). Hence, the whole discussion of chimera creation, research, and treatment quickly becomes complex and the relevant moral intuitions become difficult to parse out. The picture can also become unnecessarily complex due to our unrealistic preconceived notions about chimeras.

### Realistic and Unrealistic Chimeras

Chimeras have long engaged the imagination, as depictions of hybrid creatures have emerged across cultures. Ancient myths and artwork often surrounded chimeric monsters: creatures with characteristics of two or more different species simultaneously, such as the eponymous Greek monster with lion and goat features. In the Ancient Near East, jarring images of human-nonhuman chimeras were common in religious and public life, including Egyptian gods with animal heads and human-like bodies (e.g., Horus with avian head; Anubis, canine; Sobek, crocodilian); Hebrew and Babylonian supernatural beings with human-like heads and animal bodies, especially winged animals (e.g., Cherub and Lamassu) as on display at the Louvre; and the famous Hindu god Ganesha, which has elephant and human features intermixed so as to make differentiation difficult. Depictions of this sort are a cross-cultural phenomenon, not always with positive connotations, as Karpowicz et al. comment (2005, 108).

Fascination with cross-species hybrids is not merely a vestige of a bygone age. Lore of mermaids and unicorns continued into the modern period, and festivals to Ganesha continue even in 2016 ("How to Celebrate Ganesh..."
Chaturthi 2016”). In popular television programming, human-human (intra-species) chimeras are featured; they appear in popular television shows with sci-fi elements, such as CSI: Crime Scene Investigators (Fink, 2004) and Orphan Black (Natali, 2015), as well as in Japanese animé (Toriyama, 2002). It is no wonder, then, that the recent journalistic pieces by Rob Stein in 2015 and 2016 on National Public Radio (NPR) reporting on human-pig chimeras garnered popular readership with divergent reactions.

Hybrids and chimeras evoke unrealistic fantasy, which likely affects our intuitions and evaluations about chimeras. Whereas some hybrids are likely to terrify (à la the Island of Dr. Moreau), the resulting organisms are quite different from expectation, and upon examination they seem completely benign. The popular notions of inter-species chimeras, then, can inflate our conception of the outcomes of such unnatural combinations: we can easily exaggerate what actually occurs in the lab into something that is bizarre and undesirable. Thus, we must guard ourselves from misleading intuitions.1

Some combinations are familiar and fairly uncontroversial. We see inter-species mixtures in well-known cases, such as the mule (begotten of a donkey and horse), as well as with the rarer lion-tiger hybrids (i.e., liger: lion, tigress; tigon: tiger, lioness). Most surprising is the occurrence of chimeras within the same species. In such extremely rare cases of dizygotic (i.e., fraternal) twins fusing at an early embryonic stage in the womb, the result is a single human organism with two sets of DNA. Possessing two complete genomes, such a human has a patchwork or mosaic of tissues with different genetic origins. While such an anomaly is initially surprising to the reader, this naturally occurring phenomenon raises relatively few ethical quandaries. It is key to understand the concept behind the last chimera, since it is the closest analogue to the kind of case with which this paper is most concerned.

Whereas “chimera” bears reference in different research contexts, as noted by Karpowicz et al. (2005, 109-10) and Eberl and Ballard (2009, 471), in order to limit the scope, I will adopt the procedural definition put forth by the UK Academy of Medical Sciences, as quoted in Palacios-González (2015, 488):

Chimæras are formed by mixing together whole cells originating from different organisms. The new organism that results is made up of a “patchwork” of cells from the two different sources. Each cell of a chimæra contains genes from only one of the organisms from which it is made. (…) Primary chimæras are formed by mixing together two early embryos, or an early embryo with isolated embryonic cell types obtained from a different embryo or cultured stem cell line. The resulting chimæra has cells of different origins, in many tissues. Secondary chimæras are formed experimentally by transplanting (or grafting) cells or tissues into animals at later stages of development, including late fetal stages, post-natal or even adult animals. The donor cells are only present in a few tissues.

This definition classifies two kinds of chimeras, distinguished by procedure and outcome, as “primary” and “secondary” chimeras. The former
organism possesses genetically distinct tissues throughout the body, whereas
the latter has foreign tissues localized and not spread out – as in the cases of
tissue grafting or organ transplanting. This distinction is helpful for sorting
out the ethical significance of policies. The “secondary” chimera is far less
controversial, and there is far less ambiguity in determining what the or-
ganism is and whether it has any moral status commensurate with rational
persons. The “primary” chimera, however, resists neat categorization, and
it requires greater care and scrutiny (perhaps, caution) with respect to
whether it possesses any morally relevant attributes. Moreover, the proce-
dure involved to create “primary chimeras” is far less predictable, given that
many variables can alter the outcome drastically.

This definition is also limited to the intentional creation of chimeras. The
precedent was set by landmark experiments (Polzin et al., 1987) on goat-
sheep (a so-called “geep”) and chick-quail chimeras. The geep chimeras
were created by removing live embryos from goats and sheep, isolating the
relevant cellular masses of the goat embryos and inserting them into the
sheep embryos while at the blastocyst stage. Of the twenty-two implanted
organisms, only thirteen survived to birth, and of those that came to term
only two were true chimeras — the rest were characteristically either only
sheep or only goat. The central idea is that embryonic stem cells from a goat
were placed into sheep embryo, with varied results. This method of creating
chimeras by manipulating embryos will be the paradigm procedural case
for the purpose of this paper. With this in mind, we now move to the pro-
cesses involving human tissue.

The viability of chimeras and the transmission of the characteristics of a
given species (including not only phenotypes, but also behavior) can vary
widely. Eberl and Ballard (2009, 478) organize four major factors put forth
by Karpowicz, Cohen, and van der Kooy (2005) for predicting what kind of
creature will result from a given procedure: “(1) quantity of human material
transferred,” as the greater the number of cells, the greater the influence
on development; “(2) timing of the graft,” as an earlier introduction allows
for the foreign material to have more influence; “(3) what type of cells are
grafted,” as apparently drawing a distinction among totipotent embryonic
cells, pluripotent embryonic stem cells, multipotent adult stem cells, etc.;4
and “(4) what host animal is utilized,” for two salient biological reasons:
diverging development rates during gestation could result in one part
outpacing the other, and the proximity in evolutionary tree (whether in the
same genus or relatively recent genetic divergence in evolutionary history)
could impact whether the body structure can accommodate the distinctive
tissues to function properly.

These multiple variables limit our ability to predict what the outcome
will be, and they simultaneously raise legitimate questions regarding exactly
what kind of thing results from this process. Below I will discuss some
problems latent in the ontology of species. However, it should be noted
here that researchers recognize some salient limitations in what can occur
when grafting a nonhuman embryo and human stem cells. The quantity
and timing of cell introduction are two of the most significant factors when
determining whether the organism will become simply nonhuman with
minor differences, simply human with minor differences, or distinct from
both simultaneously. At the time Karpowicz et al. were writing, an important mice-human experiment had not yet taken place. Piotrowska (2014, 4) reports on the results of this experiment: upon injecting mice with human neural tissue, the mice were still clearly mice but with some enhancement in learning capabilities over the control group. However, there is a point of no return in an embryo’s development (although the point when this occurs may be unknown), at which time the organism cannot become something other than the genome’s original plan.

The fourth factor, regarding how different the two species in question are, is also relevant to our discussion, since it likely deflates concerns about the most bizarre combinations we can imagine. We cannot expect embryonic chimeras of vastly different species to come to term, let alone function in a healthy way so as to have rational capacities relevant to moral status. In light of this, Karpowicz et al. (2005, 125) speculate that human-ape chimeras in which we expect a human brain to replace or significantly amend the ape’s brain would likely fail (i.e., not be viable), since the cranium would need to be ‘swollen many times [its] ordinary size’ in order to house a functioning human brain. Moreover, the organization of chimp and other primate brains would prevent adequately similar neural pathways to function as a simple replacement of a cortex or lobe. While they admit that embryonic chimeras that are “undissociated” could allow for human-ape chimeras theoretically, they will most likely not occur. Given that viability and rationality is unlikely with human-primate chimeras, so is it even less likely with human-mice chimeras due to even greater incompatibilities.

What I have outlined thus far are some outcomes of some available procedures in creating chimeras. I have given examples of those occurring in nature and in the lab, and discussed some major factors that shape the development and expression of various genetic traits. We have some confidence in how to create organisms that can acquire traits that may be characteristic or typical of humans, but the procedures that would likely create beings with rational capacities are unlikely to be fruitful – exceptions being nearby primates, with qualification and hesitation. So, we recognize key sources of uncertainty, as well as the current low probability of rational chimeras. These factors serve to calm our knee-jerk reactions. It is now necessary to address species ontology more explicitly in order to locate the ethical concerns more clearly.

Chimeras, Species, and Ontology

Eberl and Ballard (2009) emphasize that the study Piotrowska comments on above, and studies like it, show that the mice that receive human brain cells did not undergo any “substantial change,” but did undergo “accidental change” (to use Aristotelian terminology). In other words, the mice remained the same kind of thing, even with the introduction of human parts. Ontologically, this is analogous to when a human acquires a heart valve from a cow or a pig. This acquisition does not change what kind of thing the human is. For example, the mice that became smarter did not cease to be mice and essentially become something else in the process. This interpretation is a “Realist” approach; the kind (what it is, its essence)
exists independently of the categories and names we assign to natural things. According to Eberl and Ballard (2009, 472-473, 477), this approach admits that our taxonomy of species does not (or cannot) perfectly align with all and only essential distinctions. An implication from this frame of thinking is that it is theoretically possible for ethics to hang on whether we correctly assess relevant substantial changes contra accidental changes. It is Eberl and Ballard’s aim in their paper to show exactly this point, while avoiding the charge of arbitrariness of favoring the moral status of humans, as in “specie-sist” or “anthropocentrist” positions.

In contrast, what may be called an anti-Realist account, or as Badura-Lotter and Fangerau (2014, 21) call it, a “Constructivist approach,” is the ontological commitment that there is no such essence or substance in nature. Rather, what we taxonomize as “species” is, if anything, merely a label that denotes a bundle of properties with a family of resemblances commonly associated together. This conception of species resists rigidity, as all boundaries are vague. Of course, it is far more plausible that on the evolutionary account this would be the case – looking back, any species’ ancestral line will meet with the ancestral line of another species. (Indeed, that is precisely the point of common descent.) What follows from this is that ethical judgments would not hang on essential or substantial differences (i.e., what a thing is), but rather they would hang on the properties that we consider most relevant for taxonomic differentiation (i.e., what characteristics a thing has). Or, as Badura-Lotter and Fangerau (2014, 21) explain:

Instead of referring to a specific ontological status of "species" (which can be violated), one can regard the concept of species as a human construction or interpretation used to handle the complexity of the environmental surroundings—a tool for categorization that faces persistent conceptual challenges reflected in the many definitions that have been used for “species” in the past and present. As a consequence, we can bestowed to "species" no greater value than people are willing and able to do in a given context.

What follows from the broader Constructivist approach is that, as Piotrowska (2014b, W9) argues, we need not be concerned with statistical distributions of traits or some kind of set natural range of exhibited characteristics in order to ascertain that some animal is a member of a given species. Especially in cases where half of the genetic material involved in an embryonic chimera is of the species homo sapiens, it is sufficient that an organism descends from homo sapiens to be a member of homo sapiens. To make this point, Piotrowska (2014a, 7) draws from the intuition that a child who is the biological descendant of some mother is sufficient to include the child in its mother’s genealogy and genetic family. The import of this discussion is that in a Constructivist approach, species membership is more flexible than may be commonly construed. Hence, when speaking of inter-species chimeras as being "unnatural" (in a negative sense of being "unfitting" or "inappropriate") or as disallowing species membership, the Constructivist can recognize that the extension of these categories – like words — can expand over time.
Thus, with this anti-Realist ontology, the very concept of a “half-breed” human-nonhuman chimera will not determine ethical considerations immediately. Whether the organism is of one species or another may be heuristically helpful, but it does not address the ethical matters on the most basic level. Rather, what characteristics it has — not the label or name it is given — will inform what level of care and dignity ought to be afforded it.\(^9\) We would not determine the moral status of an organism based on species membership. It is the prevailing accounts of dignity that we will discuss next.

**Human-Nonhuman Chimeras and Human Dignity**\(^\text{10}\)

Ethical arguments regarding the creation, research, and treatment of chimeras has been framed in terms of whether the organism is, in fact, human or sufficiently human. This strategy of assessing the ethics of chimera research has a parallel in abortion and embryonic stem cell research debates. There may be an appropriately low expectation for a neat and tidy resolution to these issues. In the Constructivist view, simply assessing whether or not the chimera is human is hasty, and the debate requires greater nuance. As we have discussed, membership in the *homo sapiens* species for chimera is debatable in a way that does not extend to the debate over embryonic stem cells and abortion. Nevertheless, how a zygote or blastocyst ought to be treated, if it has moral status at all, will be informed by those debates.

The previously cited authors align with several different positions. The various accounts interpret the basis of (human) dignity, or what is most relevant for an organism to be considered in the moral community. We may categorize these interpretations as follows:

(a) Anthropocentric approach/*homo sapiens* membership;
(b) Rational nature approach/inherent capacity for reason; and
(c) Rational psychosocial capacities approach.

As a test case for assessing these different views, and as a way of limiting the scope of the discussion, I would like to consider a single scenario: the chimera of an embryo of an animal (nonhuman) and the stem cells of a human. For the sake of argument, let the animal be a chimpanzee embryo (totipotent cells), and the human cells not be derived from an embryo but from adult human stem cells (multipotent, not pluri- or totipotent). This will avoid arguments about the moral status of human embryos, but will allow that any human traits and any organs could potentially be developed in the organism. Let the proportion of cells originating from the chimp and human be even, so as to avoid fitting either category “predominantly nonhuman” or “predominantly human.”

Let us then assume that Constructivism and Dignity-based ethics are the appropriate routes. To capture the respective concerns of creation, treatment, and research of chimeras, the central questions to answer are: (1) “Is it morally permissible to create such an entity?”; (2) “What is the necessary respect or dignity due to such an entity?”; and (3) “Would research performed on such an entity contravene its dignity?”

The Anthropocentric approach (a) argues that species membership (i.e., being of the taxis *homo sapiens*) is a sufficient (and necessary) condition for
moral status and dignity, and the corollary is that nonhumans have less or no moral status. As we have discussed, species membership ought not be the determiner of moral status in a Constructivist view; it potentially puts the cart before the horse. Species membership is not sufficient for moral consideration, as living human beings without any rational capabilities are thought to be without moral status, whether having lost rational capabilities, as in the case of sufficient brain damage, or never having possessed them, as in the case of genetic anencephalic infants (Eberl & Ballard, 2009, 475). It is also not necessary, as we can imagine an alien like Spock to have moral status even though he’s not human (Palacios-González 2015, 490). It is also relevant that other animals may be rational to some lesser degree, such as dolphins, higher primates, and pigs (Eberl & Ballard 2009, 473).

If these untoward conclusions do not dissuade the reader, one may also find that from the Constructivist vantage, this position could suggest that chimeras do have moral status the same as humans by virtue of their biological inheritance. As Piotrowska (2014a, 6) argues, lineage and genealogy matter for species membership, as a matter of genetic historical and interpersonal social fact.11 In this case, human-nonhuman chimeras would be an uncommon, but legitimate member of homo sapiens. They would have the same moral status as humans; in other words, whatever dignity and status that a human would have by virtue of species membership, the same would be true for the chimera. That would answer questions (2) and (3), but one may wonder whether it denigrates the human species to create the entity in the first place; however, the intuition could easily go the other direction: the increase in capacity would exalt the nonhuman to a privileged moral position.

The Rational nature approach (b) attempts to avoid these charges of anthropocentrism and the arbitrariness of speciesism by anchoring ethical status to having a rational nature. As mentioned before, this view adopts a less popular Aristotelian metaphysics, seeing substance as being “fixed,” more or less. An implication is that as long as the animal’s nature is rational, it has moral status. This need not require the organism to be capable at any and every moment to exercise those abilities of reason yet, but rather rationality is possessed in some sense at conception. This is a kind of capacity view, expressed in terms of active and passive potentiality (or potencies) that inhere as a part of a thing’s nature (Eberl & Ballard, 2009, 475). In other words, if the organism has the DNA encoding to generate the kind of capacities to reason, then it inherently possesses the ability (latent, unused, or being used) to exercise rationality. That quality alone is sufficient for moral status; if one were to undergo some “substantial change” and lose those rational capacities, then moral status would likewise be lost. There is much to say regarding the merits of this philosophical tradition. Briefly, however, I merely point out that if evolutionary biological history is assumed, this position is, prima facie, not the favored ontology. In other words, this position suffers from lack of coherence with other scientific disciplines.

Likewise, if the apparently undesirable implications of the Rational Nature approach fail to turn the reader away, there may be more untoward consequences of this view. The determination whether an organism is in the moral community or not seems to hinge upon the probabilities of possess-
ing the nature to develop that way. Thus, when asking if it is an immoral act to create or perform research on the organism, the answer can only be answered in terms of risk: it is a statistical or educated guess that we may continue or must refrain.¹²

One may be concerned that the creation of such a being would be impermissible: as Eberl and Ballard (2009, 480) claim, “probably no justification is sufficiently strong to justify the creation of these kinds of chimeras.” It is unclear why no justification is probable to the authors. Perhaps organ harvesting would be impermissible; perhaps unnecessary suffering would be created. But from a dignity approach, creation of this kind of chimera may be permissible within reproductive rights, just as bringing to term an infant with Downs Syndrome is permissible. Perhaps, then, if one could find some capable, informed, consenting individuals who intend and contractually agree to care for the chimera (and, say, subsidies were afforded them to remove financial burden), would this practice violate the chimera’s dignity, or would its dignity be upheld? Wouldn’t this simply be another, albeit bizarre, means of reproductive ends? The lack of justification now does not make it probable that there will never be justification.

The Rational psychosocial capacities approach (c) is quite similar to (b) in that the grounds for ethical status is capacity and not species membership; however, the capacity in view is broader than merely possessing rational faculties – it can include the psychological, social, empathetic, and other sentient capacities that we consider intrinsically valuable and typically, though not necessarily, associated with humans and their dignity. As Karpowicz et al. (2005, 120) claim, “That is, human dignity is a multi-faceted notion that is characterized by a family of unique and valuable capacities generally found in human beings. No one of these capacities is definitive of human dignity, but taken together, they set out a paradigm case of what it is to have human dignity.” Likewise, Piotrowska (2014a, 7-8) summarizes, “our moral obligations to others ought to be determined by a creature’s capacities and the moral upshot of those capacities. […] Whether it is wrong to treat a creature merely as a means to an end may depend on its capacity for rational thought, not its biological makeup. Similarly, whether it is wrong to torture a creature may depend on its capacity for sentience.” This is a compelling account for how capacities would be morally relevant, but there are some concerns.

As such, this approach appears to succeed in avoiding speciesism, which is an advantage over the Anthropocentric view. It seems more flexible and conducive to an evolutionary biology paradigm, which appears in conflict with commitments in Realist ontology. However, there are some tensions here because it seems as though the capacities referred to are things that must be “in hand,” or actual and not merely potential. This is suggested by the fact that Piotrowska explicitly denies biological makeup as grounds. Capacities could supervene on biology, but prior to the sufficient development of them to supervene, the organism would not appear to have the relevant capacities and thus not be of a moral status. Potentiality of capacities would not justify moral status, because potentiality is merely predictive biology. This means that an infant or someone with severe mental disabilities may be considered to have no more moral status than a dolphin has, or perhaps
be in an even worse state. One implication for this then is that appropriate treatment of chimeras apply when the relevant capacities are developed; chimeras ought not suffer when they become sentient, but they may justifiably be used as a means of research until the capacities for reason and deliberate goal-making are present.

Karpowicz et al. (2005), however, do not seem to give themselves the same room or to hedge themselves. Rather, they explicitly turn in the other direction. Their view appears to amount to, in the end, a kind of potentiality view of capacities, as Palacios-González (2015, 491) likewise comments. In reference to avoiding untoward consequences for infants and those with severe disabilities having lower moral status, Karpowicz et al. argue that "We tend to ascribe it to all humans, no matter how seriously impaired they may be, because there is no clear agreement about just how many dignity-associated capacities a person must possess to be said to have human dignity" (2005, 121-2). In order to reduce false negatives, we err on the side of safety. I assess that this is insufficient, for as Palacios-González (2015, 492) argues they appear to be "proposing an ad hoc speciesist solution"; or, in other words, the motivation that capacities would be valuable is that they are actually possessed by the organism, not that they are generally possessed by a species class. Consequently, Piotrowska (2014a) seems to be more consistent than Karpowicz et al., but in either case, there are situations in which chimeras' moral status would depend on the capacities they actually possess, not generally possess.

Finally, Karpowicz et al. (2005, 124) make the case not only that chimeras would have certain moral status by virtue of possession of these capacities, they argue further that even the mere creation of a chimera would contravene dignity: "if human-like capacities associated with human dignity were to emerge in such animals to some degree, the creation of this research subject would contravene human dignity." But how would this follow? The association of characteristics with human dignity being expressed in a limited way does not imply that the original source (human) is thereby denigrated. Why would it not fall the other way: that the organism that tends to have characteristics associated to not have morality is elevated to the status commensurate (or tending toward) human value? Even assuming a potentiality account, it is not as though the organism existed as possessing capacity, which then is pulled down into a less-dignified state. Rather, an entity would emerge with those valuable capacities, thus having dignity when it would have had less or none.13

There are two remaining concerns. One may reject chimera creation and research on grounds of species integrity. This concern may be adequately addressed by Karpowicz et al. (2005, 115-8), as they argue this rejection is morally irrelevant. Finally, one way in which dignity may necessarily be contravened is by the very act itself: the procedure alone may render the organism as a means to an end. However, this argument would speak not only against chimera creation and research, but also against IVF procedures. (Perhaps in all cases in which IVF is permissible, this procedure is also.)

Thus, of the three capacity views, the most plausible, coherent, and practical view for Constructivism is that of (c) the Rational psychosocial capacities approach. The result is that human-nonhuman chimeras may be
created, researched, and respected in cases where they have capacities that dignify them. These capacities are comparable with human capacities, but this ought not prevent us. Recent research might mitigate our concerns that these creatures will even come into being. But should they occur, according to these positions, it follows that the ethics of the creation, treatment, and research of human-nonhuman chimeras (in the scenarios I have given) do not relevantly differ from human IVF research and treatment. If there is any remaining hesitation to produce, raise, or care for chimeras, it would need to be justified apart from the anti-Realist and capacity-based positions here adopted. In other words, the further denial of human-nonhuman chimera creation may only suggest the denial of Constructivism or the Rational psychosocial capacities approach, or both.
Notes

1. While it may seem counter-intuitive to bring these images to mind given the warnings I have outlined, the inclusion of these chimeric depictions is to emphasize a stark contrast with what research has actually involved, so as to clip the wings of our flights of fancy and consequently weaken irrelevant moral intuitions.

2. This paper takes as uncontroversial the creation of "secondary chimeras" that do not involve grafting functional human brain or other neurological tissues into nonhuman organisms. It is outside of the scope of this paper to comment on the procedures that introduce human brain tissue in this particular manner. For a fuller discussion of the ethical boundaries of these methods, see Karpowicz, Cohen, and van der Kooy (2005), and Eberl and Ballard (2009).

3. While Eberl and Ballard identify the source as Karpowicz, Phillip, Cynthia B. Cohen, and Derek van der Kooy. "It Is Ethical to Transplant Human Stem Cells into Nonhuman Embryos." Nature Medicine, 10(4) (April 2004): 331–35. However, it is actually the aforementioned 2005 article. This is indicated by their citing the page number (p. 125) when the 2004 article that has a page range of pp. 331-5, whereas the 2005 article which discusses these factors has a range of pp. 107-34. Hence, I cite the 2005 article.

4. According to New York State Stem Cell Science (NYSTEM) website, accessed June 30, 2016, the differences among these terms can be summarized as follows: "Totipotent cells can form all the cell types in a body, plus the extraembryonic, or placental, cells. Embryonic cells within the first couple of cell divisions after fertilization are the only cells that are totipotent. Pluripotent cells can give rise to all of the cell types that make up the body; embryonic stem cells are considered pluripotent. Multipotent cells can develop into more than one cell type, but are more limited than pluripotent cells; adult stem cells and cord blood stem cells are considered multipotent."

5. Dissociation is a process of separating cells so that they are more likely to be receptive to the host's "control" in determining what the tissue will become. Undissociated cells, then, are more likely to retain their native organization. The cited authors regard as impermissible the use of undissociated human cells for the creation of human-nonhuman chimeras.

6. Eberl and Ballard (2009) also emphasize that their view is not strictly speaking an "anthropocentric view," which suffers the charge of moral arbitrariness called speciesism.

7. A theoretical possibility, then, is that how we 'carve up nature' with respect to species can, in some cases, be determined posterior to ethical concerns instead of prior to them. If so, another option emerges: the ethical values could in some cases determine our taxonomy. See also David Ludwig, "Ontological Choices and the Value-Free Ideal" (2016). There he argues that we have epistemic values and legitimate non-epistemic values in our sciences, and far from seeking to remove them, our next step should be to discern which non-epistemic values are legitimate and why. Appealing to this general principle, I suggest that ethical values could be prior to ontological decisions; Ludwig, however, does not appear to commit himself to this suggestion.

8. That is, the set of objects of which the predicate "human" or homo sapiens applies can accommodate more diverse objects over time. On the Constructivist...
paradigm, this should not concern; it fits nicely within evolutionary biology.

9. As hinted in note 9, it may be heuristically helpful only with respect to evoking the idea that particular characteristics imply ethical consideration, but this is only done after ascertaining those ethical considerations. To the point: if one of the desiderata of categorizing *homo sapiens* is to flag them as members of the moral community, then a Constructivist ought to take that flag as a strong suggestion and no more. On the other hand, the Constructivist who seeks that desideratum might attain it by including marginal cases like human-nonhuman chimeras as *homo sapiens* in light of the relevant capacities the organism has.

10. The title of this section should evoke tension given the prior discussion.

11. Piotrowska nevertheless hesitates to give anthropocentric view full credit with this conclusion. She offers some thought experiments where intuitions diverge despite having lineage/ancestral relation. Consequently, she is quite critical of the anthropocentric approach, favoring a capacity-based account of moral status.

12. Eberl and Ballard (2009) explain: “Our moral premise based on this view is that if an a-h [animal-human] chimera has the intrinsic capacity to develop self-conscious rational thought, it is a rational animal and thereby possesses the same moral accord as a human person; research on such a chimera would, thus, be akin to conducting research on a human being and it should be protected under the ethical standards protective of human research subjects.”

13. Palacios-González (2015) p. 493–5, 498 has a fuller account of chimera creation arguments. There, the same argument is made as I give above, and he provides additional avenues that Karpowicz et al. may consider – his conclusion is that arguments against the creation of chimeras are thus far unsuccessful.
References


Article 5

Eternal Perspectives in the Nineteenth-Century Friendship Albums

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Though you dear girl may trivial deem
This simple offering of esteem,
Yet take it as a tribute due
To truth, to friendship, and to you.
And with it take this fervent prayer
That you may be heaven’s dearest care.
May virtue in your heart preside,
May prudence all your actions guide.
May peace attend your future years,
May love your pathway strew with flowers.
And may you ever find a friend
True as the one by whom these lines are penned.

These were the words Miss Eliza Crawley recorded into her friend Anna Sayre’s friendship album on September 17, 1836. This verse is one of about sixty entries found within the pages of Anna’s album, along with several drawings and watercolor paintings, all of which were carefully and lovingly recorded there. According to custom, Anna would have entrusted her album into the hands of a friend for days at a time. During this period her friend was expected to inscribe in it a verse, poem, song, short story excerpt, or anything else that “captured the essence” of her friend and their shared friendship. Based on the use of words such as “esteem,” “truth,” and “fervent” in the poem above, it is clear that sincerity played a major role in the friendship of Eliza Crawley and Anna Sayre.

The practice of keeping and writing in friendship albums — “a bound volume owned by an individual that contains gifts of writing” — reached
its heyday around the middle of the nineteenth century. The owners of these albums were often young white women on the cusp of adulthood. The albums were used as a means of "sharing their fears of the future and promising to console and sustain each other" as they faced major changes in their lives in the coming of age process. The major changes these young women faced were common events in the female life cycle, most often graduation from a female academy or seminary, or marriage. Indeed, many of the entries made in nineteenth-century friendship albums were made by the owners' classmates at school, and many albums contain a surge of entries around the time of commencement or marriage. This suggests, according to historian Anya Jabour, that female community and friendship were instrumental in helping young women "cross the threshold from girlhood to womanhood." Friendship albums served as a material reflection of that female community and friendship.

Inscriptions within the albums were generally not original compositions. Many of the entries came from verses that had already been published in women's magazines and literary publications such as Godey's Lady's Book, The Ladies' Repository, and Ladies' Cabinet of Fashion, Music, and Romance. The transcribed verses dealt with a wide range of issues including death, nature, religion, family, and, of course, the joy of friendship. Choosing what to write in a friend's album could sometimes prove to be a difficult task. An entry made in a friendship album laid bare the transcriber's education and literacy, as well as her ability to choose an appropriate verse to transcribe. Furthermore, the appearance of one's handwriting in album entries was certain to have come under close scrutiny by the album's owner. Since handwriting served as "a nineteenth-century litmus test of character and culture," it was very important for friends to practice perfect penmanship when writing in friendship albums. Indeed, many albums contain traced horizontal lines to help with keeping one's letters in a straight arrangement. Clearly, writing in a friend's album was not a task to take on lightly.

Despite the important information friendship albums reveal about nineteenth-century social conditions, there has not been a great deal written about them. The foremost texts on friendship albums have been published within the last twenty years, and they focus on a wide variety of topics. Historian Erica Armstrong, for instance, focuses her study on friendship albums kept by elite African Americans living in antebellum Philadelphia. The subject of her article makes her work distinctive, as others writing on friendship albums focus on those owned by white women. Armstrong argues that these friendship albums, extremely popular within the elite African American community, helped to "reinforce their respectability within their own social circles." For example, these "emblems of etiquette" were often used as a space to record moral messages, usually about the proper roles of wives and mothers. Furthermore, impressions of respectability were accomplished in friendship albums through discussions of political topics such as abolition and women's rights. Above all, however, was the role that friendship albums played in uniting African American women across all of the northeastern cities. This bond of friendship and unity created by friendship albums, Armstrong argues, "was not a luxury; for many, it was a necessity."
Like Armstrong, Anya Jabour also writes about the importance of friendship albums in the lives of women. However, Jabour’s article is concerned mostly with the role friendship albums played in the coming of age of young white women in antebellum Virginia. She points out that young women often had a “reliance on a community of their peers to cross the threshold from girlhood to womanhood.” Friendship albums served as a representation of this bridge of friendship between youth and adulthood; they were material reminders of one’s friends that could be kept even after childhood had passed. Moreover, Jabour discusses two specific instances in which this reliance on friendship to transition into adulthood would have come into play in the lives of young women: graduation and marriage. Young women often viewed these events with great trepidation. Jabour suggests that graduation and marriage were dreaded so much because they signified the abandonment of childhood and the “undertak[ing of] adult responsibilities.” Childbirth and motherhood may have been chief among these fears, as “most women knew someone who had not survived childbirth.” Indeed, Jabour offers several examples of entries in friendship albums that seem to equate graduation from the “academy with illness and death.” Similarly, the verses dealing with weddings and marriages in Jabour’s article reveal a less than optimistic outlook on the institution. Jabour describes these entries as “sorrowful” and full of “emotional turmoil.” However, Jabour is careful to point out that in friendship albums, with their “poetry and prose, young Virginia women assured each other that, whatever trials the future might hold in store, they could rely on each other’s enduring friendship.”

Similar to Jabour, historian Catherine Kelly has directed attention to the use of friendship albums by young women attending school. She states the importance of these albums in “student culture,” and discusses their place in academies, schools, and seminaries for young women in New England. In discussing this student culture among New England women, she asserts that friendship albums offer a “window” into these young women’s friendship networks. Most importantly, she points to two main themes that appeared consistently in young women’s friendship album inscriptions: “the preciousness of friendship and . . . its fragility.” Also like Jabour, she explains the existence of many dangers that may cut short a friendship, including sudden death, the end of school, and marriage. However, she surmises that many girls hoped for their friendships (and their very selves) “to survive in the albums of their friends.”

Most recently, literary scholar Laura Zebuhr has written on how friendship albums contributed to the development of friendship in the greater Western tradition. She argues that it is difficult to put love for friends into words, something that has been a struggle for philosophers for centuries. Friendship album inscriptions, too, reveal that intimate relationships between friends — relationships in which the will to be friends should come naturally — are often ineffable. In other words, the inscriptions in friendship albums cannot do justice to the reality of what friendship is. She argues, however, that this ineffability is not a bad thing, and that in intimate friendship one need not be bothered “by the way language shapes experience.” The experience, in this case, is intimate friendship. Her philosophical and
literary analysis of friendship album verses stands out among the social and historical analyses given them by the other authors.

While the authors listed above have penned insightful and helpful works regarding friendship albums, they have skated over one particular point. Jabour and Kelly touch briefly on it when they discuss the enduring nature of friendship, but they do not delve into the topic in detail. This is the topic of eternity. It is apparent through the inscriptions made in nineteenth-century friendship albums that the young women who wrote in and owned the albums were highly concerned with eternity, with things they believed would last forever. This preoccupation with eternity raises the question of how young women in the nineteenth century related to time and to religion, both of which are inherently concerned with eternity. These topics will therefore be addressed in brief discussions of how nineteenth-century conceptions of time and the Second Great Awakening affected young women. This will be followed by an examination of the friendship album verses themselves, which contrast things that last forever with those that do not. The verses reveal that young women often condemned the temporal nature of things such as youth and suffering, and in contrast praised the enduring and eternal nature of things such as God and friendship. The friendship albums used to complete this study contain entries ranging from the years 1824 to 1857 and were owned by young women scattered across the eastern United States. Slightly more than half of the young women were from Pennsylvania, and the others hailed from New York, Massachusetts, and Virginia.

Understanding nineteenth-century conceptions of time and eternity is essential to understanding friendship album entries from the same period. People in the nineteenth century, Thomas Allen argues, were concerned with the future, with time that had not yet passed. The future was especially important to women, due to their serving as the “mechanism for the perpetuation of national virtue into the future” through “maternal education, a nineteenth-century revival of the work of republican motherhood.” This, of course, led to the establishment of female schools and academies to help train the young women who would in turn train the next generation. Harriet Curry attended one such school: Whitesboro Female Seminary in Oneida County, New York. Her friend Jane Waters demonstrated young women’s inclination toward thinking about the future when she wrote “Oh! May your future hours be given/ to peace, to wisdom, and to heaven.” While “the future” is not the same as eternity, the two are similar in that they are both concerned with what is to come, and certainly this preoccupation with the future led many young women to contemplate the eternal in their friendship albums.

Like conceptions of time, it is important to understand the religious climate of the first half of the nineteenth century in order to fully understand the emphasis on eternity in the inscriptions in friendship albums. This religious climate was defined mostly by the Second Great Awakening. By the time the friendship albums of this study were composed, much of the Second Great Awakening had already taken place. Its effects could still be seen. For example, the emotional nature of revivals during the Second Great Awakening paralleled the rise in sentimentalism in the literature of the
time. This emotionally charged literature often found its way into friendship albums. An example of such emotional writing appears in Mary W. Morris’ album:

Can I forget, or cease to love thee?
Yes, when the sun forgets to rise,
Or when the fadeless stars above thee
Forget to shine, or leave the skies.
Yes, when the magnet, faithless never,
Does to the pole forget to turn;
When virtue and thy soul shall sever,
This heart for thee shall cease to burn.28

The ardent assertions of this lover strongly appealed to the emotions of the reader. Additionally, the Arminian teaching of the Awakening, which allowed both the “sinner and the minister a positive and active role in the conversion process,” can be seen in friendship albums.29 One example appears in the album of Harriet Curry, from an entry by her friend L. Foote: “But another change has taken place, concerning which all other changes may be called visions. I speak of a moral change, a passing from death unto life. Truly my heart rejoices in this change.”30 Although the young woman did not explicitly say she had experienced a conversion, it seems likely that that is exactly what happened. Her eternity was decided. Furthermore, the Second Great Awakening saw a higher proportion of young women experience conversion than any other demographic group.31 Nancy Cott suggests that this was because “during the years of the Second Great Awakening...it was likely that young women’s experience contained one or more disorienting elements.”32 Cott argues for a disorientation that was caused mainly by economic changes, but, as other scholars have shown, experiences such as graduation and marriage also created an unsettling environment for young women. In the midst of this disorientation, it is no wonder that scores of young women turned to religion, which offered a new birth into a “secure” family of Christian brothers and sisters, and which “could resolve young women’s uncertainties about the future.”33

While conceptions of time and the religious climate reveal that young women in the nineteenth century were concerned with eternity, the inscriptions in their friendship albums do so even more. In order to celebrate eternal things, as so many of the inscriptions did in nineteenth-century friendship albums, a distinction must be made between what is eternal and what is merely temporal. Young women did plenty of this in their friendship albums by explicitly pointing out what would last forever and what would not. Youth and beauty, as well as the suffering caused by death and the geographic separation of friends, were some of the most commonly identified temporal things.

Youth and beauty were often portrayed in friendship albums as fleeting. This entry offers one example:

To twine a bouquet fair and bright;
One that will charm the mental sight,
And help fond memory to retrace,
The hand of friendship and of grace,
Mark, my Caroline, how the roses
Emulate thy damask cheek;
How the bud its sweets discloses -
Buds thy opening bloom bespeak.
Lilies are, by plain direction,
Emblems of a double kind;
Emblems of thy fair complexion,
Emblem of thy purer mind.
But, dear girl, both flowers and beauty
Blossom, fade, and die away,
Then pursue good sense and duty:
Evergreens, which never decay.34

The author's comparison of her friend's beauty to flowers, subject to
death and decay at the end of each growing season, offers an apt analogy to
the transitory nature of youth and beauty. It is significant, however, that the
author ends with an encouragement to pursue things "which never decay":
good sense and duty. This shows how enduring attributes that could be
cultivated over the span of one's entire life were celebrated. Some entries,
however, bade the album's owner to make good use of her youth. For
example, an entry in Anna Sayre's album describes youth as a "joyous time
of blossoming," a "gladsome time," and "cheerful and bright." The inscriber
then insists that Anna "enjoy it . . . while [she] may."35 Another entry cited
Ecclesiastes and told Mary Eleanor Williams to "Remember now thy creator,
in the days of thy youth," while also urging her to "remember him also, who
now endeavors to impress upon your youthful mind this important exhor-
tation [to remember her creator]."36 Mary Eleanor received an additional
entry from a friend who wrote: "Now in thy youth, beseech of Him/ Who
giveth, upbraiding not:/ That His light in thy heart become not dim,/ and
His love be unforgot."37 The common theme among these entries is that
while youth does not last forever, it is a wonderful opportunity to draw
close to God and call upon him for salvation.

In addition to youth, suffering was also depicted in friendship albums
as fleeting, something that only lasted for a short time in this temporary
life. Death is a heavily discussed source of suffering in many friendship
albums. Indeed, friendship and death seem to have been connected. Irene
Brown suggests that "friendship...was a kind of affection that called for a
particular acceptance of death and separation."38 Death, and the suffering
that it caused, must be accepted between friends, she argues, because "by
adhering to new and old friendships and living in anticipation of a beautiful
death, [one] looked to another world where all temporary sensations would
end, indeed past memories [of friendship] would be sharpened."39 The term
"beautiful death" describes a death that is didactic, a death that highlights
the morality and piety of the deceased and provides an example for those
still living. The acceptance of a beautiful death, therefore, meant embracing
the hope of reuniting with friends again in Heaven, even though there must
first be suffering before reunion.
The topic of death can be seen in many entries in the friendship albums. One reads:

This world is full of fancied joy,
Pursued with eager breath,
Each pleasure proves a fleeting joy,
And all is false but death.
Let us not prize Earth’s fruitless joys,
They serve but to degrade,
One single breath divides their joys
From those that never fade.40

While this entry warns the reader that death’s shadow hangs over every pleasure in this earthly world in a general sense, other entries deal with specific instances of death within families. For example, one entry, addressed “To Miss Anna Marie Sayre, on the Death of her Dear Sister Priscilla,” prompts Anna to “weep not for her” who has died, for “she is an angel now/ and treads the sapphire floors of Paradise.”41 A later, more somber entry in the same album reads, “Many laid unexpectedly on a dying bed have asked the solemn question ‘must I die’ with an emphasis which a view of eternity alone can give.”42 Clearly, the owner of this album came face-to-face with the suffering caused by death. In another example, Abby Jane Williams wrote verses entitled “Moral Beauty” in her friend Harriet Curry’s album, next to which Harriet later inscribed “drowned in Lake Erie, June 27, 1835.” Death, often sudden and unexpected, was a large part of these young women’s lives.

Despite the suffering caused by death, it is made clear by other friendship album inscriptions that this suffering was seen as merely temporal. For instance, one entry reads, “The winter of death cannot annihilate the hopes of immortality beyond the grave.”43 Indeed, the suffering brought on by death was softened considerably when “women pinned their hopes on reunion in the next world,”44 for “in Heaven, if not on earth, female friendships could be eternal.”45

The geographic separation of friends was another form of temporal suffering these young women wrote about in their friendship albums. One entry reads: “Will you my friend when far away/ recall those hours you’ve passed with me/ And oft at evening as you stray/ Think how I wish myself with thee.”46 But despite the hardship of being apart from dear friends, various entries in their friendship albums reassured the young women that reunion was certain, even if it occurred after death or through memory. For example, this entry in Jane Barnitz’s album celebrated a reunion that occurred only through fond remembrance of her friend:

When distance severs kindred souls,
Affection’s lasting tie ne’er rends;
But fancy roves where ocean rolls,
And loves to dwell with absent friends.
Then smiling hope’s elusive ray,
Its care-dispelling influence sends,
And gilds the hours that pass, away
From those we love, - from absent friends.
Oh! can there be in life, a charm
More sweet than retrospection lends,
When dwells the heart with rapture warm;
On past delights - and absent friends?
That soothing charm I would not lose
For all the bliss that wealth attends;
Its joys could ne'er calm infuse,
So sweet as thoughts of absent friends.47

Another entry in Jane's album expresses the joy she would experience upon reunion with friends in Heaven:

Beyond the flight of time,
Beyond the vale of death,
There surely is some blessed clime
Where life is not a breath,
Nor life's affections, transient fire,
Whose sparks fly upwards and expire.
There is a world above,
Where parting is unknown;
A whole eternity of love,
Form'd for the good alone;
And faith beholds the dying here
Translated to that glorious sphere.48

The hope of reunion with friends through death and memory, as described in these verses, shows how the suffering of separation was viewed as transitory. Friends could not be kept apart forever.

In album verses which focused on the temporal things that would eventually pass away, there was almost always an exhortation to instead trust in everlasting, eternal things. It was in these verses that young women from the nineteenth century revealed their penchant for the perennial. Some of the most frequent subjects in these verses are God, prayer, and friendship itself. All of these things were deemed to have everlasting qualities.

God is one of the most prominent subjects in friendship album verses relating to eternity. God and religion were indeed quite important to women in the nineteenth century. By the Victorian period, women were "portrayed as inherently pious by nature," and they used this image of piety as a foundation for launching three important reform movements: abolition, temperance, and missions.49 Young women's piety was evident in their friendship album inscriptions. One copied verse urges the reader to "look aloft" when "in the tempest of life" in order to "be firm, and be fearless of heart." The same poem encourages a betrayed friend to "Look aloft" to the friendship which never shall fade."50 Another poem declares Christ as the "friend [when] in need," who "bids us openly to join his flock."51 The instructions to turn to God in times of need in these poems show how eternal things were foremost in the minds of young women writing in friendship albums.
Furthermore, they stress that friendship with God himself was the ultimate everlasting friendship.

In addition to poems about God, it was common to see prayers for friends copied down in friendship albums. For instance, the first page of Mary Eleanor Williams' friendship album contains this heartfelt dedication: "May all the names recorded here/ In the Lamb's book of life appear." Many albums also included inscriptions from preachers and Sunday school teachers. For example, Archibald Lamon wrote to Mary Eleanor Williams:

Remember now thy creator, in the days of thy youth. And remember him also, who now endeavors to impress upon your youthful mind this important exhortation. Think of his affection for you as one of the lambs of his flock — think of his many and affectionate appeals, and that although he may be separated from you by many a "hill and dale," his heart's desire, and prayer to God, still will be that you may be saved.52

Lamon's words reveal a sincere and earnest hope for this young woman: that she set her mind on eternity with God and be saved. Similarly, Harriet Curry's Sabbath School teacher wrote in her album:

Here is one leaf reserved to me,  
From all thy sweet memorials free;  
And here my simple song might tell  
The feelings thou must guess so well.  
But could I thus, within thy mind,  
One little vacant corner find,  
Where no impression yet has been,  
Oh! It should be my sweetest care  
To fix my Savior's image there.53

This poem was originally published with "To write my name for ever there" as the last line. That the Sabbath School teacher would instead write, "To fix my Savior's image there," suggests a deep devotion to God, as she gave up recognition of herself in hopes that her pupil would remember God. Clearly, eternity was an important concern for this young woman.

In addition to a hope in an eternal God, friendship albums reveal a hope in enduring and everlasting friendship between young women. Carol Lasser points out that friendship between women during the nineteenth century offered "an enduring and intimate relationship, creating a sense of stability and community even as the contexts in which American women lived changed."54 This was reflected in friendship albums, where friendship was eternal through remembrance, even after death.

Memory served as one important way to maintain friendships and allow them to endure. For example, an entry in Harriet Curry's friendship album read: "These lines are traced by friendship's hand/ for friendship's eye to view/ when time and distance intervene/ to hide this hand from you."55 When Harriet was not in the company of the friend who wrote this, she could read her friend's handwritten message in her friendship album, which would certainly have served as a means to fondly remember their times
together. Other lines such as “while we read the lines here pen’d/ they bring
to mind an absent friend,”56 and even a simple “Remember me,”57 with no
other words in the entry, would also serve to stir one’s memory on behalf
of friends. Remembrances written down in friendship albums acted as a
means of “memorializ[ing] friendship,” something that certainly helped it to
endure throughout eternity.58

Through memory and faith in God, friendship was even able to endure
the separation of death. Indeed, Jabour argues that “female friendship was
more powerful even than death.”59 One friendship album verse that reflects
this sentiment celebrates everlasting friendship in Heaven: “Friendship, that
silken thread, that mystic tie/ Which binds two hearts in amity/ No power
on earth can sever/ Death may burst the land in pain/ Twill reunite in
Heaven again/ To part no more forever.”60 Another entry consoles the reader,
“though now it is ours to say farewell, may it be our happy portion to meet
where that painful word is never spoken.”61 These album entries suggest that
these young women believed their friendships, once in Heaven, would pick
up right where they left off on Earth. Friendship, in their eyes, certainly
was eternal.

The friendship albums kept and written in by young women in the
nineteenth century reveal that they placed a premium on things that lasted
forever. Through the verses they copied down for each other, they show
how the prominent religious innovations of the Second Great Awakening
affected them, and they reveal that popular conceptions of time also defined
their preoccupation with the future. Most of all, friendship album entries
show how young women valued the everlasting over the ephemeral. Tran-
sitory things such as youth, beauty, and suffering were dismissed in favor of
enduring communion with God and friends. Friendship, of course, was the
ultimate enduring joy to these women, and the survival of their friendship
albums through to the present day proves the unending nature of
their affections.
Notes


4. While the focus of this study will be on friendship albums owned by young white women, they were not the sole users of friendship albums. Elite African American women in Eastern cities such as Philadelphia and Baltimore also kept friendship albums as a means of asserting their respectability in society. See Erica Armstrong, "A Mental and Moral Feast: Reading, Writing, and Sentimentality in Black Philadelphia," *Journal of Women’s History* 16, no. 1 (2004): 78-102.


6. Ibid., 134.


8. Ibid., 438.


10. Ibid., 86-87.

11. Ibid., 94.

12. Ibid., 98.


15. Ibid., 140.

16. Ibid., 142.

17. Ibid., 145.

18. Ibid., 151.


21. Ibid., 79.

22. Ibid., 80.


24. Ibid., 449.

25. Hometowns of the friendship album owners: Harriet Curry was from Oneida County, New York; Mary W. Morris was likely from Philadelphia; The owner of Friendship Album 8605-1-B hailed from Attleborough, Massachusetts; Jane Barnitz was from York, Pennsylvania; Mary Eleanor Williams lived in Fredericksburg, Virginia; and Anna Sayre was a resident of Susquehanna County, Pennsylvania.

26. Untitled verse, signed by Jane Waters, February 26, 1835, Harriet Curry Friendship Album. Commonplace Books and Friendship Albums, Manuscripts of Early National and Antebellum America, Department of Special Collections, Hesburgh Libraries of Notre Dame, South Bend, IN.


32. Ibid., 19.

33. Ibid., 22.

34. Untitled verse, signed by Emily, February 21, 1830, Friendship Album 8605-1-B. Commonplace Books and Friendship Albums, Manuscripts of Early National and Antebellum America, Department of Special Collections, Hesburgh Libraries of Notre Dame, South Bend, IN.

35. "Lines on Youth Addressed to Miss Anna Marie Sayre," Anna Sayre Friendship Album, Commonplace Books and Friendship Albums, Manuscripts of Early National and Antebellum America, Department of Special Collections, Hesburgh Libraries of Notre Dame, South Bend, IN.

36. Untitled entry by Archibald U. Lamon, November 8, 1835, Mary Eleanor Williams Friendship Album, Commonplace Books and Friendship Albums, Manuscripts of Early National and Antebellum America, Department of Special Collections, Hesburgh Libraries of Notre Dame, South Bend, IN. This entry was apparently written by a clergyman, one of the few examples of male writing in female friendship albums.

37. Ibid., Untitled, unsigned, and undated verse.


39. Ibid., 375.

40. Untitled and undated entry, signed by Mary, in Mary Eleanor Williams Friendship Album. Also appears as "Lines Written for a Lady's Album," in *Graham's Illustrated Magazine of Literature, Romance, Art, and Fashion*, vol. 3, no. 4 (April 1828): 188.

41. Unsigned verse, November 3, 1832, Anna Sayre Friendship Album. Also appears as "A Dirge," in *Blackwood's Magazine*, vol. 20, no. 27 (July 1826): 100-101.

42. Ibid., Untitled, unsigned, and undated entry.

43. Untitled and unsigned entry, February 26, 1835, Harriet Curry Friendship Album.


45. Ibid.

46. Untitled verse, Signed by "Ann Maria, December 19th," Friendship Album
8605-1-B.

47. "Absent Friends," unsigned and undated, Jane Barnitz Friendship Album, Commonsplace Books and Friendship Albums, Manuscripts of Early National and Antebellum America, Department of Special Collections, Hesburgh Libraries of Notre Dame, South Bend, IN. Also appears in *The Ladies' Literary Cabinet*, vol. 1, no. 18 (March 11, 1820): 143.


51. Untitled verse, signed R. A. H., May 1832, Attleborough, Massachusetts, Friendship Album 8605-1-B.

52. Untitled entry, November 8, 1835, Mary Eleanor Williams Friendship Album.

53. "To Miss H. M. Curry, From her Sabbath School Teacher," November 14, 1833, Harriet Curry Friendship Album.


56. Ibid., Untitled, unsigned, and undated entry.

57. Ibid., "Remember Me," signed by M. E. W., undated.


59. Ibid., 155

60. Untitled, undated entry, signed "Mary," Friendship Album 8605-1-B

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Article 6

Quality Improvement in Drilling Silicon by Using Micro Laser Assisted Drilling

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The micro-laser assisted drilling (µ-LAD) of monocrystalline silicon (100) using a diamond cutting tool coupled with a laser was tested in order to improve the cutting edge quality of drilled samples. The laser beam is transmitted through an optically transparent diamond drill bit and focused precisely at the tool-workpiece interface, where the material is under high pressure induced by the diamond tool. This essay presents the investigation of the influence of the laser power on the quality and inner surface finish of the drilled materials. Different laser powers were used to carry out the experiments. The experimental results indicated that the µ-LAD tests were successful in making precise holes in the silicon (100) samples with high edge quality, when comparing the holes made by a laser to the holes created through other methods.

Introduction

In machining, making high quality products is very important as it can affect their function. In drilling in particular, edge quality and circularity of the holes are important factors. Mechanical properties of the material can
make drilling more challenging. Hard and brittle materials such as ceramics and semiconductors have many desirable properties that make them ideal for many applications, but for the same reason make them more challenging to cut, compared to metals for example. Due to the hardness of these materials, the cutting tool gets worn very fast; due to the brittleness of these materials, edges chip away and sometimes cracks appear on the holes’ edges. Although drilling is an established process, it has many limitations. Current conventional methods such as mechanical drilling and non-conventional techniques such as laser drilling, micro-electrical discharge machining (micro-EDM), photo-etching, ultrasonic, and micro-electrical chemical machining (micro-ECM) have limitations (Egashira & Mizutani, 2002; Jahan, Wong, & Rahman, 2012; Moon et al., 2014; Rashed et al., 2013; Ziki & Wüthrich, 2015). Mechanical drilling is limited by the hardness of the tool that can be used. The thermal stability and wear resistance of the conventional drilling tools are significantly reduced above high temperatures because of material properties (Tönshoff, Spintig, König, & Neises, 1994). Even diamond, as the hardest material known, gets worn depending on the hardness of the workpiece material. Researchers have studied the errors in mechanical drilling for many years. V. Schulze et al. (2010) examined conventional mechanical drilling errors and surface damages of a glass fiber workpiece reinforced with composites. Non-conventional methods such as laser drilling suffer from inaccuracy and unwanted thermal effects. Other processes such as EDM or ultrasonic are limited to certain types of material that they can drill.

Micro Laser Assisted Drilling (μ-LAD) is a new technique to drill hard and brittle materials introduced and under study at Western Michigan University, Nano Manufacturing Laboratory. In μ-LAD, as shown schematically in Figure 1, the laser beam is transmitted through an optically transparent diamond drill bit and focused precisely at the tool-workpiece interface, where the material is under high pressure induced by the diamond tool. The laser softens the material under the tool, which leads to lower cutting forces and therefore lower tool wear and longer tool life.

It has always been a challenge to drill brittle and hard materials such as ceramics and semiconductors free of fractures, damage, cracks, and micro-cracks, with good edges and high surface quality, due to these mate-

Figure 1. Schematic of μ-LAD process
Quality Improvement in Drilling Silicon

Materials’ low fracture toughness. Often, severe fracture can result due to their low fracture toughness. The μ-LAD technique allows the drilling of brittle materials without fracture.

Using the laser assisted technique to machine hard and brittle materials is reported in literature. Mohammadi et al. (2015) used the micro laser assisted machining (μ-LAM) technique to machine and improve the surface finish of silicon. Ravindra et al. (2012) used the same technique for scratching the silicon with and without using lasers and studied the high pressure phase transformation (HPPT) on the material. In Mohammadi et al. (2013), they studied the effect of using a visible laser wavelength, green, on scratching the silicon.

The focus of this study is on micro drilling of single crystal silicon (100), which is a very brittle and hard to drill material by conventional methods. This article will discuss the effects of using a laser on process outputs such as edge quality and surface roughness of the wall of drilled holes. For this purpose, a number of tests with different setups have been carried out to find the best drilling condition. Since this process is in the early stages and under study, measuring the cutting forces is essential to control the amount of load on the diamond cutting tool. Even though diamond is a very hard material, it is a very fragile material, especially at the sharp cutting edge. Monitoring the forces during the testing helps to ensure that the tool is not damaged.

Experimental Setup

In the first setup, a load cell is mounted on the Universal Micro Tribometer (UMT) manufactured by CETR-Bruker Inc. The UMT was modified to perform the cutting and drilling test on it, as it has micrometer resolution, which makes it ideal for a high level of accuracy (Figure 2). The laser used in these tests was an IR, CW fiber laser with a wavelength of 1070 nm and maximum power of 100 W. The drilling bit was a single edge diamond bit with a 0.5 mm radius with -45° rake and 45° clearance angle. Negative rake angle is common for machining brittle materials to keep the compression on the material and avoid any tensile stress, which causes fracture. The diamond bit is mounted on a nozzle, as shown in Figure 3, which is attached to the optical part of the setup called Beam Delivery Optics (BDO). The sample was mounted on a circular disc as a replaceable stage that can be fastened to the spindle. The air bearing spindle, a product of Professional Instruments Co., has a runout error of less than 2μm. In this setup, the sample rotates instead of the tool, which is similar to the drilling operation in the turning process. As the sample is rotating, before each test the tool should be moved to the center of the spindle and the sample should be mounted at that position to avoid any inaccuracy. A fixture was designed for bringing the tip of the tool to the center of the spindle before starting the tests. By using a long focal length microscope, it was ensured that the tool was positioned at the center of the spindle.

In this process, many parameters can be adjusted such as the rotational speed (RPM), feed rate, laser power, and depth. The rotational speed selected for a safe range for the tool and setup was 1000 RPM. This value is
Figure 2. μ-LAD Setup used to perform the tests.

Figure 3. Nozzle that holds the diamond drill bit.
not the limitation of the process, but it was the limitation of the setup. Feed rate is the minimum value that can be adjusted on the equipment. Since the silicon is very hard and brittle, chip thickness plays an important role. For the selected rotational speed and feed rate, the chip thickness was 120 nm, which is a common chip thickness for this material (Kovalchenko, 2013). Holes are blind, and as the tool is single edge and round, a dimple shaped hole can be achieved. As the tool is curved, the diameter of the holes depends on the depth and for 40 μm depth, the diameter is ~460 μm. Crucial to the process is the selection of laser power, because the cutting process is happening at one spot of the workpiece and it could cause undesired thermal effects such as overheating. High laser power can cause thermal cracks and even burning, which would result in a rougher surface. Drilling parameters such as RPM, feed rate, laser power, and depth are shown in Table 1.

Results and Discussion

After performing the drilling with different laser power conditions, the sample was cleaned and imaged under a microscope. The first series of tests shows non-circularity and fractures on the entrance edge, as illustrated in Figures 4. In the no laser case, non-circularity is apparent when comparing the resulted edge to an ideal circle (i.e., the yellow dashed circle), as shown in Figure 4(a). By comparing the images, circularity was improved slightly by using the laser, although the edge chipping still occurred, as shown in Figures 4(b) and 4(c). This improvement in circularity was mainly due to thermal softening, which decreases the hardness and the strength of the material. Figure 5 shows the circularity improvement of using a laser, which decreased the error by almost half. Despite this improvement, quality of drilled holes was not ideal due to the low rigidity of the setup.

In order to improve the quality of the entrance edges, the rigidity of the setup is essential. Even though it was important to monitor the forces to avoid any damage to the diamond drill bit in the first tests, using a load cell that is not rigid enough can weaken the stiffness of the setup. The type of load cell used for the first series of tests works based on how strain gauges movement. The load cell acted like a spring in the setup, which is suitable for low speed tests. Therefore, to increase the stiffness, the load cell was removed from the setup. Since the range of the load was obtained and was

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotational Speed</td>
<td>1000 RPM</td>
</tr>
<tr>
<td>Feed Rate</td>
<td>2 μ/s</td>
</tr>
<tr>
<td>Laser Power</td>
<td>0, 10, 20 W</td>
</tr>
<tr>
<td>Depth</td>
<td>40 μm</td>
</tr>
</tbody>
</table>
Figure 4. Edge entrances quality compared to an ideal circle (a: without laser, b: 10W, c: 20W, d: after increasing the rigidity of setup)
found to be low enough to not damage the tool, no other type of load cell was used.

By repeating the tests without the load cell in the force loop, a very clean entrance edge with an improved circularity was achieved. As shown in Figure 4(d), the edge of drilled holes shows no evidence of edge chipping with circularity error of $<< 1\mu m$.

**Surface Quality**

Since samples were single crystal silicon, it was possible to have fractures of the drilled surfaces, especially on the inner surface of the holes. The bottom of the drilled holes was imaged, and resultant surfaces are shown in Figure 6. As mentioned before, using the proper laser power level is very important in this process. Low laser power is not enough to soften and cut a ductile; on the other hand, a high intensity laser can cause overheating problems. Figure 6(a) shows the surface quality for low laser power, which still has some fractures left on the surface, while using a high laser power can burn the surface, as shown in Figure 6(c). For this particular set of tests, a 20 W laser power gave the best results, Figure 6(b), with no sign of fracture or burn on the inner surface of the hole.

**Future Work**

The technique presented is still in its early stages, and this study is based on the results achieved so far. For future work, the $\mu$-LAD process will be used for drilling different materials such as ceramics, carbon fiber reinforced composites, and rocks. To better understand the effect of other
parameters, more tests need to be performed. Studying the tool wear and the use of cutting fluid are other aspects of the process to be investigated.

Conclusion

This article introduced the μ-LAD process for drilling hard and brittle materials. It was shown that by increasing the rigidity of the setup, better quality results, including better edge entrance, were achieved in drilling silicon. Results showed that the μ-LAD tests were successful in making precise holes in the silicon samples with high edge quality, when comparing the silicon cut using a laser to the silicon cut with other methods. Inner surfaces were compared, and the best possible laser power to achieve the best surfaces was 20 W for this particular setup.

Acknowledgments

The author would like to thank the National Science Foundation (PFI: AIR–TT, Award #: 1445017) for funding this study. Barkin Bakir is supported by TUBITAK-BİDEB 2219 / TURKEY International Research Program
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The Hilltop Review
Volume 9   Number 1   Fall 2016

A Journal of Western Michigan University
Graduate Student Research