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THE SIGNIFICANCE OF THE INFORMAL WASTE SECTOR IN A MINORITY WORLD COUNTRY: A CASE-STUDY OF METROPOLITAN ATLANTA

by

ANAMARIE SHREEVES

Under the Direction of Katherine Hankins, Ph.D.

ABSTRACT

This research examines the informal waste sector in a Minority World context through interviews with informal waste workers, city officials, and material buyers in metropolitan Atlanta. Globally, the informal waste sector is often unacknowledged or explicitly excluded by the jurisdictions in which they operate, and those working in the informal waste sector experience significant vulnerabilities. The empirical findings of this research expose the similarities of the informal waste sector in the Minority World (countries with a disproportionate share of political and economic power) to that of the Majority World (countries historically victimized by colonialism and imperialism, and most recently, capitalism), where the work is precarious and the workers are often vulnerable to economic and political pressures. I also found that the informal metal-recycling sector in metropolitan Atlanta is unacknowledged by the city officials and, in some cases, the sector is criminalized.

INDEX WORDS: Informal waste sector, waste management systems, Minority World countries, Majority World countries, urbanization, recycling

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by

ANAMARIE SHREEVES

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of

Master of Science

in the College of Arts and Sciences

Georgia State University

2020

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by

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January 2020

DEDICATION

☆☽ ☼ energy ☼ ☾☆

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I acknowledge melanated bodies that have been deemed waste, and disposed of, thrown away; these people have helped me to really understand why waste is violence. I'm talking about

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1 INTRODUCTION

Two garbage collectors, Echol Cole and Robert Walker, who were crushed to death by a malfunctioning truck, and 1300 of their sanitation brothers were the reason Civil Rights leader Martin Luther King, Jr. was in Memphis on the day of his death in 1968 (Estes 2000). The workers, mostly black men, were operating dilapidated trucks, they were denied deserved overtime pay, they were covered in filth, and they were making so little that they depended on public assistance to feed their families. The strikers, who proclaimed "I AM a Man," were demanding better pay, safer working conditions, and dignity for their work (Estes 2000). The strike began on February 12, 1968, and by February 14, 10,000 tons of trash had piled up in the streets of Memphis (AFSCME), sparking the then-mayor of Memphis, Henry Loeb, to yell at the strikers "go back to work!" in a city council meeting. Loeb then quickly hired strikebreakers to keep the sight of trash off of his revenue-generating Memphis streets.

Nine years later in Martin Luther King Jr.'s hometown of Atlanta, a similar strike would erupt that would result in a similar ending. Sanitation workers went on strike beginning February 9, 1978 after protesting cold weather work conditions (Lawrence and Price 1977) and a raise of 50 cents per hour that Maynard Jackson, the first black mayor of Atlanta, would refuse to negotiate (Lawrence 1977a). Jackson fired the labor strikers three days after the strike began, which was supported ironically by MLK Jr.'s father Martin Luther King, Sr., who had insisted that Maynard "fire the hell out of them" in reference to the laborers on strike (Lawrence 1977b, McCartin 2005). In both the Memphis and Atlanta strike, the strikers— union laborers under the American Federation of State, County, and Municipal Employees— knew their strike would cause an unsightly pile up of trash and therefore utilized the power of trash to make demands. The power of trash has been used widely by authorities and marginalized groups both to make

demands, because trash is the evidence of a flaw in the capitalist system—a system that drives urbanization. The amounts of waste large cities generate exceeds cities' capacities to manage the waste environmentally and aesthetically (Moore 2009). The moment the mechanisms that manage waste in the modernized setting are broken, the *blasé*[1] urbanite, and its government, are left to deal with the complications of their own poorly-designed infrastructure system. Poorly-designed infrastructure in urban spaces is not limited to southern United States and the utilization of trash as a tool is not limited to the formal, unionized waste sector. This research found that in both the "Majority World"[2] and the "Minority World" governments are unable to accommodate the demands of waste disposal, and the dynamics and power and waste are expressed by municipalities, communities, and informal waste workers, alike.

The emphasis on using the terms "Majority World" and "Minority World" in this research is intentional in an effort to view the research from a Majority World perspective. Literature within the geography discipline is often written from the Minority World perspective, which is biased, considering the Minority World only makes up 20% of the world's population (UNCTAD 2017). This is especially true in the study of urbanization because most of the urban growth that has occurred in the 21st century occurred in Majority World countries. The common terms of distinction, "West/Third World" and "Developed/Developing" have a bias to the world of the elite, which is apparent in the nomenclature as well as the emphasis on the elite spaces as

[1] Blase urbanite is a termed used by Georg Simmel to describe city denizens with acquired privilege and a lack of apathy for issues that surround their environment, Credit: G. Simmel, "The Metropolis and Mental Life," in D. Levine, ed., On Individuality and Social Forms (Chicago: University of Chicago Press, 1971), 329–30.

[2] The use of the terms "The Majority World" and "The Minority World" is informed by an article by Marc Silver, in which challenges the common terms used to distinguish affluent countries from modest countries. The term Majority World, is a way to describe countries in Africa, Asia, South and Central America and the Caribbean, and it is considered a fairer description because these countries make up the majority of the world's population. Silver uplifts that the term is used to remind the western world that it is "a very small minority on the globe." The term will be used in this research to avoid diminishing countries based on their economic status.

the standard (Robinson 2002: 531). The condition often neglects places of informality because of their "otherness". The standard of the Minority World becomes how Majority World countries are unfairly assessed (Robinson 2002), often being framed as nascent and unsophisticated. This is why this research uses the terms Majority World and Minority World to describe the informal sector in two varying urban settings. The use of Majority/Minority highlights the misnomer of 'minority' that is often used in countries like the United States, where people of color are defined as minority despite their majority population percentage outside of the United States. The misuse of the term 'minority' is echoed by Robinson (2002) who argues for the need to promote an urban theory that represents a much wider range of cites, and in the case of this research, countries. Within the waste sector, this research explores the common ground among cities in the Majority World and the Minority World by examining the informal waste sector.

As more countries in the Majority World increase the size of their middle class, they are adopting similar expectations of the Minority World, including neoliberal politics and privatized services (Roy 2005), the visual aesthetic of the modernized city (Moore 2009), and the increased generation of waste (Gregson et al. 2017). Due to the limited ability of cities to cope technically with their most pressing waste-management issues, urban expansion exposes problematic gaps for many cities (Moore 2009).

The gaps in municipal services are often filled by the informal sector, whose participants seize opportunities to meet societal needs while making a living (Nzeadibe 2009). Although the informal sector fulfills essential needs, such as waste management and the repurposing of discarded materials, the sector is often unacknowledged by formal authorities (Fergutz et al. 2011). In the Majority World, the lack of acknowledgement of the informal sector by the formal sector has made the ability of participants in the informal sector to making a living difficult

(Nwosu et al. 2017). In the Minority World, there is limited research on the significance of the informal sector. The research on informal waste in the Minority World that was included for this literature review includes community-based recycling organizations in Ireland (Davies 2007), civil groups in New Zealand that desired to fill in the gaps of the central government and private sector (Davies 2009), and the "waste commons" in Melbourne, Australia that encourages various forms of revaluing waste (Lane 2011: 395). As such, questions remain about the significance of the informal waste sector in Minority World countries—and the conditions under which informal waste collectors work.

In this research, I use a case study of metropolitan Atlanta to explore the significance of the informal waste sector. In particular, I focus on the viability of informal metal recycling as a livelihood for waste collectors, and the relationship between municipal government and these informal waste collectors. To answer these questions, I interviewed actors in the local informal and formal waste sectors, including waste collectors, material buyers, and city officials. Interviews with 13 actors in the informal waste sector in Metro Atlanta were analyzed and coded by prevalent themes, and my findings suggest that the informal waste sector in metropolitan Atlanta is similar to that of cities in the Minority World, where the work is precarious and often the workers are vulnerable to economic and political pressures, although there is a difference in scale and impact between the two settings. I also found that the informal metal sector in metropolitan Atlanta is unacknowledged by the city officials and sometimes, as in the Majority World cities, informal waste collectors are criminalized for their work.

In what follows, I review the literature on the nuanced relationships between society and waste, exploring the growing generation of waste, the unevenness of waste, and the inadequacy of waste management systems to cope with waste. The literature review then looks at the use of

waste as a tool for both marginalized and authoritative groups to make demands in the city. I then look at how gaps in the formal waste sector have forged informality, and how the long-term work of the informal sector has made the sector essential to society—and yet workers in this sector maintain a precarious existence.

2 LITERATURE REVIEW

2.1 A global unevenness of waste

There is an uneven distribution of waste among Majority World and Minority World countries. While Majority World countries, which are 80% of the global population, make up 40% of waste generated, Minority World Countries, which are only approximately 20% of the global population (UNCTAD 2017), make up 60% of the waste generated globally (Baker et al. 2004). This phenomenon can be attributed to two multi-scalar conditions, including the uneven distribution of waste due to urbanization and the link between affluence and waste generation. The first condition, urbanization, reveals an uneven distribution of waste across settlement patterns and highlights the intensity of waste generation in urbanizing and urbanized areas (Lane 2011; Moore 2009). Lane (2011) asserts that the amount of waste generated in large cities, globally, consistently exceeds the capacity to manage the waste environmentally and aesthetically. Scholars describe the second condition as the 'waste crisis', in which over-consumption and built-in obsolescence has led to a proliferation of waste (Packard 1960 as cited by Gregson 2015). Other scholars discuss the convenience of disposability in growing affluent cultures, which has led to increased usage of single-use materials (Gregson 2010, Lane 2011). For example, Nabegu (2010) studied household waste composition in Kano, Nigeria and found higher percentages of disposable material and packaged food waste in more affluent communities. This correlation expands far beyond specific communities, as the unevenness of waste can be observed in comparing the waste generation—and management—across countries.

2.2 The mobility of waste as a socio-technology

Much of the research on waste suggests a relationship between high-income and low-income countries, where the majority of the waste comes from high-income countries and

trickles into low-income countries (Khoo and Rau 2014, Nzeadibe 2009, Gregson 2015, Gregson et al. 2010). This process of waste transfer can be described as a socio-technology, which involves complex mechanisms of a place that has been molded over time by people, culture, infrastructure, and technology. Scholars use this concept to articulate the trajectories of cities, industries, production networks, and economies (Murphy 2015). Murphy (2015) defines socio-technology as a multi-scalar system that is defined by dynamic factors such as social experimentation and technology innovation. An example of socio-technology would be the refurbished furniture industry in Bangladesh, which is driven by the import of end-of-life commercial ships sent to be 'broken' and a globalized growing middle class in Bangladesh's cities (Gregson et al. 2010). Davies (2009) defines socio-technology when describing waste (im)mobilities, where waste becomes the connection between two contrasting spaces, such as the expected waste from Minority World countries becomes a 'natural resource' that is 'harvested' for livelihood in Majority World countries (Nzeadibe 2009). Khoo and Rau (2014) point out that underdeveloped regions function as 'safety valves' that have helped to keep waste issues invisible to modernizing regions, even calling underdeveloped regions 'dumping grounds.' Furthermore, Gregson (2015: 682) defines this kind of socio-technology as a form of neo-colonialism, where the effects of "throwaway consumer" societies in the Minority World are 'externalised' in Majority Countries, where land use and human health is jeopardized. What Murphy defines as "socio-technology" and Davis defines as waste (im)mobilities are conceptual tools in waste research that challenge the linear approaches to research in social sciences (Urry, 2000 and Shaw, 2010), a discipline that Sheller and Urry (2006) argue has ignored and trivialized the systematic movements of people for work, family, leisure, and for politics. Global scale relations are expressed in local development, and this research looks at the socio-technical

connection that informal metal recyclers in Metropolitan Atlanta have developed from collecting discarded materials for livelihood. Geographers recognize that mobilities shift the constituents of waste in uneven and complex ways (Urry 2000), and the impacts waste has in remote spaces exposes this unevenness.

2.3 Evidence of human impacts in remote spaces

Globalization has caused the risky by-product of the Minority World standards (overconsumption, cleanliness, excessiveness) to spill over into the Majority World, and permeate inaccessible spaces such as remote beaches and body tissues. Bauman (2004) states that because of globalization, modern standards have reached the 'full limits' of the planet, where territories defined as void of human habitation are now covered in evidence of human existence. The researchers point out that the assertion "the planet is full" is a contention not of technical/physical matter but of the human effects of globalization (Bauman 2004: 69). The human impacts of globalization can be seen in a study of Persistent Organic Pollutants (POPs), a by-product of hazardous waste incineration, where traces of the pollutants can be found in breastmilk and accumulated in body tissue (Khoo and Rau 2009). The impacts of globalization invade the cellular makeup of living things and inoculate spaces with limited human interaction. Scholars have adopted the term 'Anthropocene' to describe this new epoch, which acknowledges humanity's impact on the full coverage of the earth (Cook et al. 2015). Scholars blame the proliferation of waste on affluent, Minority World countries, which Khoo and Rau (2009: 977) describe as the "more developed West", whose members deflect their waste on Majority World countries.

2.4 Affluence is up, waste is up

Researchers have acknowledged a correlation between increasing affluence globally and the increased generation of waste (Matsunaga and Themelis 2002). More specifically, shifts in consumption behaviors have caused a spike in solid waste generation in the United States and Nigeria (Ludwig et al. 2003, Nabegu 2010). A study completed in Nigeria, Nabegu (2010) found the difference in waste composition among income classes exposed the different standards of living and consumption patterns. In the study, affluent communities disposed of more non-essential items such as newspaper, plastic, rubber, textiles, and metal, while low-income communities had a higher composition of essential waste such as food scraps (Nabegu 2010). With global increase of affluence, there is a growing pattern of purchasing non-essential items, which Gregson et al. (2017) define in a case study in Midlands, United Kingdom as the 'throwaway society'. For example, an urbanized and increasingly globalized Bangladeshi middle class, has established a robust industry of upcycled, and preferably transient furnishings (Gregson et al. 2010) that are affordable to purchase and because of the low price point, can also be conveniently thrown away.

Lane (2011) argues that affluent communities have influenced the production of cheaply made consumer goods that are easy to discard and replace. The throwaway society is defined as households that accumulate a surplus of belongings, therefore, often needing to 'save' or 'waste' things (Gregson et al. 2017). Moore (2009: 435) describes the growth pattern as the "excess of modernity" where the modernized place relies on a productive economy, fueled by planned obsolescence and expansive consumerism as a measurement of success. The positive correlation between excess and affluence is often attributed to the history of planned obsolescence, which was a concept notably coined by Bernard London in his publication "Ending the Depression

Through Planned Obsolescence". London wrote a convincing dialogue about the need for government sanctioned planned obsolescence in order to stimulate and maintain consumption, which would maintain jobs and pull government funds from aiding suffering Americans of the Great Depression (London 1932). Planned obsolescence strategies are still prevalent today. In 2014, T-Mobile released the JUHU! campaign that encouraged customers to break their current phones in order to receive new phones (Wieser and Tröger 2015). London's theory supported the revival of the U.S. economy, and hence, cities in the United States, by increasing the demands of materials, subsequently increased jobs and wasteful consumer habits. The amount of waste generated in large cities around the world continues to exceed the capacity to enclose waste through industrial recycling channels (Lane 2011), and so, increasing quantities of waste materials have become material symbols of contention within the cityscape.

2.5 Trash and power

Waste is a powerful tool that can be used by governments to assert authority or by marginalized groups to demand civil rights. The modern city's obsession with producing cleanliness and order is necessary in order for authorities to display 'control' over their constituents. Researchers agree that when failures in waste management arise, such as that expressed in waste-worker strikes, waste becomes visible, and therefore, undermines institutional authority (Moore 2009, Millington and Lawhon 2018). Kristeva (1982, as cited by Moore 2009) describes this visibility of waste as 'filth,' which the scholar defines as a risk to the symbolic order that has been produced by urbanization. McFarlane and Silver (2017) discuss a similar cleansing in Cape Town, where Black people were forcibly removed under the Public Health Act of Uitvlugt. Rodriguez (2001: 28) points out historical "acts of cleansing" as irrational policies to discipline the modern Latin American citizen living in the colonized city. In an essay, Marcia

Stephenson (2001) discusses the legal abrogation of the rural *ayllus* of the Bolivian highlands in 1874 after the modern state stigmatized communities by pointing out open defecation and animal husbandry as unhygienic housekeeping. In more modern times, U.S. cities at the Mexican-U.S. border published media that represented undocumented migrants as the people who 'trash' America, as a way to frame migrants as unfit to live the "American" way (Sunberg 2008:871). Racial segregation is innately "American" as organized homeowners' associations were developed in an effort to maintain the 'cleanliness' of the suburbs by explicitly denying Black Americans from moving into suburban neighborhoods (Sugrue 2014).

Cleanliness can be viewed as a municipality's exhibition of control over its domain, and on the contrary, waste can be used as a political tool by marginalized groups, who are often labeled disposable by authorities, to demand services and policies (Moore 2009, Millington and Lawhon 2018). For instance, a group of activists blocked off Oaxaca City's municipal dump in 2001 causing 2,500 tons of trash to spill into the city's streets and pressuring municipal authorities to extend municipal services to the marginalized neighborhood of Guillermo Gonzalez Guardado (Moore 2009). Cresswell (2014) defines the power of waste as a 'critical' mobility. When interrupted, critical mobilities, such as animal (dead or alive) mobility or the mobility of hazardous waste, force people to consider deeply why certain materials move in specific ways (Cresswell 2014). Critical mobilities expose consumers to the unintended consequences of their behaviors, and force people to critique—and possibly alter—their behaviors (Cresswell 2014). Because this fragile exposure could potentially decrease consumption habits, mechanisms are put in place through city governance to conceal waste (de Coverly et al. 2003).

2.6 The modernized city promotes cleanliness and order

The processes utilized to produce a modern city will inevitably produce a proliferation of waste (Moore 2009). For affluent populations, the desirability of a modern city is based on standards such as the modern city should be “clean, rationally ordered, and armed with modern technology” (Moore 2009: 428). Mechanisms are put into place to achieve the clean and orderly standard (de Coverly et al. 2003; Moore 2009). Moore (2009) states that the normative vision of the city— clean and orderly— is achieved by modern governance ensuring that citizens are one step removed from the consequences of their waste. De Coverly et al. (2003) contends that to hide the modern society’s waste generation problem, a variety of mechanisms have arisen through which waste is rendered invisible. The authors identified three major mechanisms to make waste invisible to the public including: 1) human socialization against waste, 2) the role of rubbish bins, and 3) the work of garbage collectors (de Coverly et al. 2003). The invisibility of waste, subsequently, facilitates excessive consumption among urban denizens (de Coverly et al. 2003). De Coverly et. al. (2003) suggests that systemic mechanisms help to maintain a city’s appeal by making waste disappear. It is important to point out that waste does not simply disappear; rather, it is relocated to another place where collectors, materials buyers, and manufacturers anticipate the arrival of waste for some form of commodification.

Scott (1998 as cited by Roy 2005: 150) calls the maintenance of the city appeal, “high modernism”, which is the ideal that an efficient city is one that looks organized and aesthetically clean. Roy (2005) argues that the visual outlook of the city does not inherently correlate to the city’s ability to function smoothly.

While the city is often viewed as a clean, orderly, and bordered place, many scholars argue that the city is a heterogeneous mix of untidy and clean, rural and urban, informal and

formal. Scholars such as Dovey (2012), Roy (2005), and AlSayyad (2003) have condemned the notion that a part of the city should be deemed unimportant and marginal, simply because it does not look and function like the more acceptable elements of the city.

2.7 The global mobility of waste

The uneven mobility of waste globally is a socio-technology that transverses country borders and oceans. Within this global socio-technology, Minority World countries benefit from both formal waste management within their countries and the relocation of additional waste streams to Majority World countries. Among European countries, Mihai and Apostol (2012) witnessed that the Southern and Eastern European countries were not fully covered by sanitation services and depended on informal waste management. On the other hand, existing Western and Northern European Member States had sophisticated waste management services and also exported additional waste streams (2012). Mihai and Apostol (2012) noted that Western and Northern European countries have healthy economies that allow for them to have formal waste management services (Mihai and Apostol 2012).

In this research, the informal waste sector is defined as self-directed collection, revaluing, and/or processing of unwanted materials to be reintroduced into industries for residential and/or commercial commodities. This definition is informed by Rogerson's (2001) description of the informal waste economy. The informal economy of waste is structured through a complex network of waste pickers, itinerant waste buyers, second-hand markets, dealers and a range of recycling industries. The scavenging economy consists of (1) those street scavengers who tour streets pushing wooden carts and collecting used bottles, cardboard or newspapers, (2) itinerant scavengers who pick through garbage bins or roadside dumps searching for recyclable scrap and

other materials (3) the activities of collection crews who often sift garbage for sale to scrap dealers, and (4) dump scavengers who are those informal entrepreneurs who work from city refuse dumps (Bubel, 1990).

Informal waste collection is less mainstream in the Minority World, despite the fact that the Minority World is a common source of waste for the informal waste sector in Majority World countries (Khoo and Rau 2014; Mihai and Apostol 2012). The socio-technical distribution of waste among Minority and Majority World countries is defined by the policies, cultural phenomena, and inequalities centered around the relocation of the materials from point A to point B, and through space and time (Shaw 2010). Geography scholars quantify this relocation through methodological approaches such as life cycle assessments, an environmental engineering approach to quantify the metabolic flows of a certain object, and "follow the thing", which studies the complex path of a particular waste, and how that waste engages with the world in its 'final' state (Davies 2012: 192). For example, in the outskirts of Chittagong, Bangladesh, a robust chock chocky— refurbished furniture— industry has established due to the consistent import of end-of-life ships from all over the globe and an increasing middle class (Gregson et al. 2010). Lower-middle class Bangladeshi's can thank informal waste workers who melt, mold, hammer, and refinish salvaged maritime materials for their cheaply-made desirable furniture. Globally, the workings of the informal sector help to manage and often repurpose discarded materials.

2.8 Informal waste collection is essential to society

Geographers agree the informal waste sector is an integral piece of society in both the Majority and Minority Worlds (Lane 2011; Nzeadibe 2009; Nzeadibe and Anyadike 2012; Nzeadibe & Mbah 2015). Despite the absence of many informal waste collectors in Minority

World countries, a socio-technical relationship exists between Majority and Minority World countries, where waste shipped from Minority World countries often becomes sources of materials that informal waste collectors in the Majority World depend on for livelihood and long-standing entrepreneurial pursuits (Rogerson 2001). Contrary to the Minority World, the Majority World maintains a robust informal waste sector because of non-existent and weak structures of formal waste management (Rogerson 2001).

Alsayyad (2003: 26) asserts that informality is an "organizing logic" that is birthed from the paradigm of liberalization. The paradigm of liberalization is what has created the unequal distribution of public services, which Graham and Marvin (2002: 1) call "splintered urbanism." Splintered urbanism refers to duality that occurs in urbanized space once public services, such as utilities and education, are privatized, and the consequential provision of infrastructure favors select users and outcasts marginalized social, racial, and economic groups (Graham and Marvin 2002). In metropolitan Atlanta, splintered urbanism has caused a lack of waste services for a portion of the residents. The informal recycling sector helps to fill the gap by collecting metal from residential sites that do not have recycling services, such as multifamily apartment buildings and complexes.

Many scholars studying the informal sector argue that the informal sector is more than a resource for impoverished masses but integral economically, socially, environmentally and aesthetically to the global city of the Majority World (Dovey 2012). The informal sector is a place where "entrepreneurial flexibility, adaptation and creativity" thrive (Dovey 2012: 371). Researchers have recognized waste as an important resource for poor and urban populations that harvest the unwanted materials for commodification and livelihood (Nzeadibe 2009). Nzeadibe and Mbah (2015: 293) call the entrepreneurial model of the informal waste sector a "vehicle for

sustainable livelihood creation," and identify the informal waste sector as part of the "green economy." Researchers highlight that the informal waste sector conserves non-renewable resources, generates jobs, mitigates climate change, and helps to save cities money and landfill space (Fergutz et al. 2011; Nzeadibe & Mbah 2015; Thieme 2010). Nzeadibe and Anyadike (2012) acknowledge waste collectors as active players in the urban economy in Majority World countries and highlight the informal waste collectors as a distinct and heterogeneous group within the production of the modern city. Although the informal sector fills a gap for both Majority and Minority World countries, and despite the benefits the informal waste sector brings to municipalities, the informal waste sector in Majority World countries is often unacknowledged by municipalities.

2.9 Informal waste sector unacknowledged by municipality

The informal waste sector is often an unseen contributor to the management of waste in the city (McFarlane and Silver 2017; Lane 2011). Nzeadibe (2009) and Adama (2012) state that even with the absence of municipally managed waste infrastructure in African cities, the informal waste sector remains a critical yet unacknowledged gap filler in the waste and recycling system. Urban informality has been defined as activities that occur on the periphery of the state (Roy 2005), and being situated outside of the state makes informality a space that is underexplored by authorities and scholars alike (Kamalipour 2016). Dovey (2012) defines informality as the part of the economy unacknowledged by economic calculations. Dovey's definition is mirrored in this research, where the informal waste sector is typically not included in waste-management analysis conducted by cities and other formal institutions. The omission of the informal sector in understanding the city, is unfortunate, because informal activity plays a key role in the way the city works (Kamalipour 2016). Kamalipour (2016) asserts that the

informal sector, though random, has an underlying logic that exemplifies maturity and sophistication akin to the formal sector that the informal sector works with interpedently.

Oteng-Ababio (2011) identified the significance of the informal waste sector in Gama, Ghana, and suggested that including the informal waste collectors into solid waste management plans would be socially desirable for the city. Oguntoyinibo (2012) points out a lack of social acceptance as a major reason that informal waste pickers in Nigeria have not been integrated into the solid waste management policy. Rogerson (2001) researched the role of the informal waste sector on the urban waste economy in several cities in Asia, Africa, and Latin America, and found that informal waste entrepreneurs were more likely to work in spaces where municipal policy is not prohibitive of their existence (Rogerson 2001). In a case study in the Philippines, a micro-lending scheme was erected near Metropolitan Manila's biggest and oldest landfill to support, mostly low-income, women collectors with micro-enterprise development. Many scholars assert that municipal policy should acknowledge rather than hinder or exclude the work of the informal waste sector (Adama 2012; Nzeadibe 2009; Oguntoyinibo 2012; Oteng-Ababio 2011; Rogerson 2001). Despite the lack of acknowledgement of the informal waste sector from cities, geographers have conducted research on the informal waste sector to better understand the sector's significance in the Majority World. Kamalipour (2016) argues that in order to pursue opportunities for the informal waste sector to improve through micro-scale design interventions and upgrades, the morphologies and adaptations of the informal sector must be analyzed in depth.

2.10 Lack of research on informal waste sector in Minority World

Although research on the informal waste sector in the Majority World is robust, little is known about the informal waste sector in the Minority World, specifically in the United States.

To date, informal waste sector research that is available for the Minority World focuses on community-based waste schemes in Ireland (Davies 2007), New Zealand (Davies 2009), and Australia (Lane 2011). The lack of research on the informal waste sector in Minority World countries can be understood because the informal waste sector is not the dominant waste infrastructure utilized in Minority World countries, and therefore, the presence of research on this topic is dominated by studies completed on Majority World countries.

The lack of research on the informal sector in the Minority World can also be understood because of the often condemnation of the informal in the Minority World, and the dichotomous comparison of the formal to informal, which often places the formal in a hierarchical rank above that of the informal. Scholars point out a shaming of the informal sector that happens in the broader study of urbanization. The informal sector is often described as a chaotic mess connected to squatting, crime and poverty (Dovey 2012). In comparison, the formal is perceived as sterile, rigid, clean and tidy, and the 'correct' way to urbanize. Many scholars argue that the formal and informal are not separate but rather synchronized through transactions, economies, places, and construction and settlement (Roy 2005 and Dovey 2012). Dovey (2012: 271) defines the relationship as "two interconnected theoretical frameworks." Roy (2005) opposes the dichotomous comparison of the informal and formal, asserting that because of a series of transactions the two are not separated. Contrary to the common disapproval of the informal, the informal sector is known to have intelligent infrastructure that serves both the marginalized and Simmel's *blasé* urban denizens (AlSayyad 2003).

Kamalipour (2016) asserts that the way informal infrastructure is designed is similar across various informal morphologies, and I suggest, across country and continental borders. Leitner and Sheppard (2015: 230) highlight Helen Longino's "local epistemologies", which

suggest that all knowledge is first and foremost local, and from local knowledge, certain theories emerge as the dominant thought. Dovey (2012: 375) refers to this as “assemblage thinking”, where the research of one phenomenon cannot be comprehended through a single point of view. This research explored the local knowledge based of informal metal recyclers in Metropolitan Atlanta. Despite the perception, urban informality is mature, productive, and creative (Dovey 2012). Alsayyad (2003: 9) calls urban informality a “new” way of life, where survival mechanisms emerge from marginalized urban residents creating modes of urbanism that are capable of replacing previous constructs of urban life. The lack of research on the informal waste sector in the Minority World suggests a need to research the informal waste sector in Minority World countries.

2.11 Purpose of the Study

While the informal waste sector in the Majority World has been well researched, the informal waste sector in the Minority World remains uncharted in geography research. The primary purpose of this study is to explore the geography of the informal waste sector in the Minority World through a study of the informal metal recycling sector in metropolitan Atlanta by analyzing data on lived-experiences of actors in the informal waste sector. This research asks, ‘What is the significance of the informal waste sector in metropolitan Atlanta?’ In what follows I evaluate the meaning of informal work and the significance of the informal waste sector for individual recyclers that collect metal for livelihood. I also evaluate the relationship between municipal waste management and informal waste collectors, to explore how the informal waste sector is perceived by authorities.

This research supports Roy’s (2005: 147) assertion that researchers need to shift away from the dichotomy of “First World ‘models’ and Third World ‘problems’”, and rather seek the

interwoven relationship between informal and formal. Roy (2005) asserts that urban informality is an opportunity to look at the exceptions to formalized urbanization. Roy (2005) highlights that exceptions to the formal are not limited to the Majority World, but in areas concerned with distributive justice in urban planning. Areas with a lack of distributive justice exists in Minority World countries like the United States, and for the sake of this research, I look at conflicts of distributive justice within the waste sector of the metropolitan Atlanta region by applying subaltern theory to the study of urban waste.

This case study is a disruption of the academia status quo, because this study suggests that experts on a topic can be people on the margins and from outside of academia. Kamalipour (2016) argues that the study of urbanization needs to involve different geographies of knowledge to comprehend the vast, fast-paced urbanization that is happening in the margins. As such, this research resists the reduction of informal to a comparison against the formal. This research was forged from a robust set of literature from the Majority World to inform our study on the Minority World. This research was also mostly informed by the relevance and norms of the informal waste sector in the Minority World, and therefore this research challenges the normative processes and practices of the Minority World.

The body of research on the informal waste sector contends that there is a direct correlation between waste industry production and increasing global affluence (Hoornweg & Bhada-Tata 2012). The research suggests that the informal waste sector is a critical mechanism of urbanization (Nzeadibe 2009), which ultimately helps to maintain a standard of cleanliness and order (Moore 2009). Informal waste sector research also suggests that the informal waste sector in the Majority World is not well supported by governments, often hindering the legitimacy of the industry (Nzeadibe 2009; Oteng-Ababio 2011; Oguntoyinibo 2012). This

research explores how much the informal waste sector contributes to the livelihood of city dwellers and asks to what extent does the municipality acknowledge the informal waste sector in a Minority World country. In what follows, I will explain the methodology I employed to examine the informal waste sector of metropolitan Atlanta.

3 METHODOLOGY

3.1 Methodology: A Case Study of the Informal Waste Sector in Metropolitan Atlanta

Metropolitan Atlanta is an urban region that covers 2973.72 square miles and has a population of approximately 4.6 million (ARC 2019). The region is constituted by over 50 cities and spans 10 counties, and includes Cherokee, Clayton, Cobb, DeKalb, Douglas, Fayette, Fulton, Gwinnett, Henry and Rockdale counties (ARC 2015). To date there is no coordinated waste management system for the region, but rather waste infrastructure in metropolitan Atlanta varies depending on the municipality. For instance, the City of Atlanta collects a fee from residents to operate its own fleet of waste trucks with city-employed collectors to collect waste. The waste is then taken to privately-owned landfills, where the city is charged a tipping fee by the ton for disposal. On the other side of a jagged border with Atlanta sits the newly-incorporated City of South Fulton, which relies on seven waste management vendors to collect residents' waste. Under a city ordinance all residents of the City of South Fulton are required to enroll in waste management services with one of the seven vendors. The City of Morrow, 15 miles south of Atlanta, has a contract with Advanced Disposal to collect and dispose of the waste for the city's 1,500 homes. This patchwork of municipal and county waste management leaves gaps—and opportunities—for the informal waste sector. As such, this research explores microscale waste management through informal metal recycling in metropolitan Atlanta to determine the specific lived experiences of the participants in order to make suggestions about what could be trends within the broader metropolitan Atlanta region and possible commonalities in other metropolitan city regions in the Minority World.

3.1.1 Location

For the scope of this research, a mixture of three sampling types was used in order to identify participants. I utilized snowball, typical case, and convenience sampling approaches to identify research participants. The snowball sampling, which identifies potential participants from suggestions from existing participants (Hay 2016), was used to identify some formal sector participants as well as informal sector participants. The typical case sampling, which illustrates the average or typical pool (Hay 2016), will offer some insight on the types of people that recycle metal in metropolitan Atlanta. The ability to recruit different types of people in the informal sector was also why I chose the convenience sampling (Hay 2016), which is also known as on-site recruiting (Gomez and Jones 2010). The convenience sampling technique was chosen to recruit participants from two metal recycling sites to better understand the experiences of the informal metal recyclers in metropolitan Atlanta. The two sites include Pirkle Inc Scrap Metal Recycling (598 Wells St SW, Atlanta, GA 30312) and Amerigo Metal Recycling (1340 Forest Pkwy, Morrow, GA 30260). These recycling sites are two of many metal recycling sites in the metropolitan area. Pirkle Inc. is an identified location for this research because of its centrality in the city of Atlanta. Pirkle Inc. is the closest metal recycling site to City of Atlanta's City Hall (1.6-mile distance), and this recycling center receives many of the metal recyclers that collect metal on foot. Amerigo Metal Recycling is an identified location for this research, because it is located in

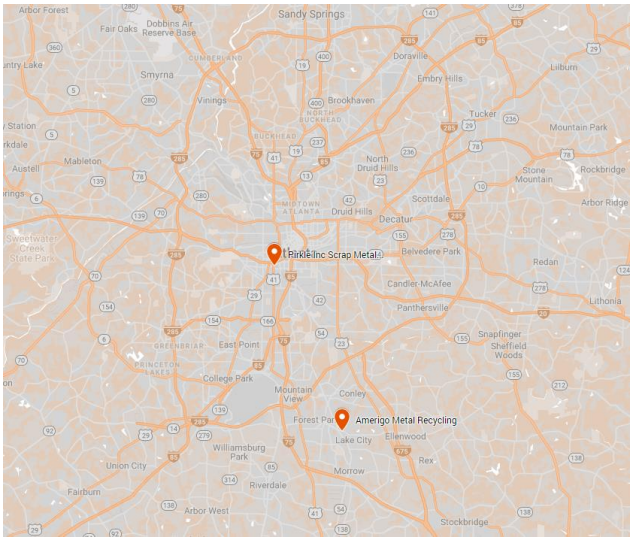

Figure 1 Research area with two recycling centers, where interviews were conducted.

an industrial corridor, where many informal recycling industries conduct business, and therefore, receives metal recyclers from various backgrounds.

Metropolitan Atlanta was intentionally chosen as the study site for this research. The region's connection to prevalent neoliberal practices and globalization makes the area a microcosm of the global mobility of waste and discarded materials. Atlanta, the Black Mecca and the birthplace of the New South rhetoric, has historically urged for growth (regionally and internationally) at the expense of the marginalized residents (Hobson 2009). This growth emphasis, which prioritizes market-based services, allows for this research to explore how the push for modernization has left gaps in social services in Atlanta (Hankins 2014).

Atlanta's historical attempts to erase homeless populations make the Atlanta region an interesting space for studying the informal sector, which often includes a large portion of people at risk of vulnerable conditions, like homelessness (Nzeadibe et al. 2012). Beginning with Atlanta's early roll out phase of neoliberalism in the 1970s (Steffen 2012), then the ordinance that banned urban camping right before the 1996 Olympics (Hopkins & Nackerud 1999), up until 2019's SuperBowl, where the city hosted a press conference to clear encampments two weeks before the game (Stokes 2019), Atlanta has displayed intolerance for homeless similar to the 'cleansing acts' mentioned in previous sections of this writing. The prevalence of homelessness in Metro Atlanta, makes the area fertile for potential informal workers—people who work on the margins of the formalized city.

Influenced by neo-liberal politics, metropolitan Atlanta area has also been deemed an international "gateway"; from Strait and Gong's (2012: 134) definition of metropolitan Atlanta as a "newly emerged immigrant gateway" to the "Gateway to the South" case study connecting the area's hyper-activity to high sex trafficking activity (Emory Global Health Institute 2016: 1)

to Buford Highway being culturally named “The Gateway to the Global South” (Whitaker 2017). With the region’s gateway to the Majority World identity, the area is an ideal location to explore the gap in literature between informal waste work in the Majority World and informal waste work in the Minority World. This research is hinged on the idea that the informal sector in both the Majority World and the Minority World share commonalities despite the differences in the structured world around them. Rather than looking at the formalized infrastructure of materials management, the research explores the systems of waste that are developed through the mechanics of people, a socio-technology.

Although the research sites are located in Fulton and Clayton counties, waste that enters the designated study sites traverse counties and even states before being designated as a recovered material. The metropolitan Atlanta region is expected to add 2.5 million people by 2040 (ARC), and this research will explore the significance for informal waste collectors in the fourth fastest-growing metropolitan area in the United States (US Census Bureau 2018). The research on waste infrastructure, and specifically the informal waste sector is uncharted for metropolitan Atlanta, and findings from this research can contribute to our broader understanding of the significance of the informal waste sector in a Minority World country.

For the scope of this research, I explored the significance of the metal recycling sector because, as Wright et al. (2002: 1) declared, “for as long as human society has been able to melt metals… metal remelting or recycling has occurred.” Globally, metal is always valuable within urbanized areas, and especially adjacent to affluent communities, or as in Bangladesh, the metal of end-of-life ships is transformed into refurbished furnishings (Gregson et al. 2010). In China, a vast informal e-waste recycling sector exists due to rapid electronic production within the country and boatloads of imported e-waste that is relocated to the country (Chi et al. 2011). Even

within municipal managed waste structures in Minority World Countries, metal recovery is a top priority because of its value (Lane 2011). In Australia, metal is one of only four materials that the government waste management agencies focus on recovering (Lane 2011). In addition to the value of metals, studies suggest a growing significance for microscale materials management or resource recovery technology, which revalues niche waste types, such as metals, into commodities to be reintroduced into supply chains (Knapp 2010). Scholars have suggested the need for a wide range of resource recovery technologies that are apart from conventional waste management systems such as landfills and incinerators (Corder 2015, Lane 2011). Lane (2011) asserts that conventional waste management systems are too large scale to sort and recycle materials by type, therefore, the study of microscale waste management such as metal recycling, is necessary. Knapp (2010: 1890) refers to a ‘‘widening’’ and ‘‘deepening’’ of the commodity frontier and designates “flexible mining”— above ground scrap metal mines— as the more cost effective, geographically flexible, and sustainable alternative to below-ground mining. If this argument is true, then this research’s specificity on metal recycling is a contribution to the larger knowledge of revaluing used goods, specifically in a Minority World country.

3.1.2 Participants

This research included 30- to 60-minute interviews with actors in the local informal and formal waste sectors, including waste collectors, material buyers, and city officials. The approximate length of the interviews was 52 minutes. Interviews were conducted from Mid-September - October 2019. A total of 13 people were interviewed for this research, and eight of the 13 interviews were informal metal recyclers. I used an Interpretative Phenomenological Analysis (IPA) approach were the sample size was intentionally small in an effort to give each participate voice within the study. (Robinson 2014). The IPA approach was also chosen because

the research was conducted within a defined setting (Robinson 2014). Each informal metal recycler was compensated $15 for 30-60 minutes of their time. The details of each informal metal recycler are listed below in Figure 1.

Figure 1: Demographics of Informal Metal Recyclers Interviewed

Name	Race	Sex	Age	Years Recycling	Full Time, Part time supplemental.
Miss Liz	Black	Female	Mid- 50s	15	Full Time
Willie	Black	Male	Late-50s	15	Full time
William	Black	Male	54	16	Supplemental
Carlton	Black	Male	52	3	Supplemental
Gordon	Black	Male	58	11	Supplemental
KW	Black	Male	69	1	Supplemental
Samuel	Black	Male	60	60	Supplemental
Reggie	Black	Male	56	14	Supplemental ; occasionally full time

During the data collection process, I visited the two recycling centers on November 3, 8, 11 and 13, 2019 for interviews. Approximately 25-30 informal waste collectors were engaged onsite at the recycling center to participate in research, the eight selected collectors were available at the time to complete an interview.

The details of each non-informal participant are listed below in Figure 2.

Figure 2: Details of Non-Informal Participants Interviewed

Name	Role	Organization
Sylvia Redic	City Manager	City of Morrow
Kanika Greenlee	Executive Director of Keep Atlanta Beautiful Commission and Environmental Programs Director for the Department of Public Works	City of Atlanta

Antonio Valenzuela	Director of Public Works	City of South Fulton
Steve Levetan	Former Lobbyist and Executive Vice President	Pull-A-Part, LLC
Abby Goldsmith	Consultant	A. Goldsmith Resources, LLC

Each non-informal participant was contacted initially by email to participate. Nine other non-informal participants were invited to participate in the research, however, they were unresponsive, unavailable, or unqualified on the subject.

3.1.3 Data Collection, Processing and Digital Curation

Interviews were first audio recorded and then transcribed into digital notes. Interviews were completed in-person or via phone, when in-person interviews were not possible. Interviews with informal waste collectors were often completed on site at recycling centers near the vehicle of the interviewee or on the sidewalk, or in public spaces such as gas stations. Interviewees were requested to participate in research, and if the participant was a self-employed recycler, they were offered $15 for a 45-minute to 1-hour long interview. Non-informal interviews were completed in the office of the interviewee or in a conference room in the building in which the participant worked. One interview, with Steve Levetan, was completed by phone due to an inability to schedule an in-person interview. Once the data collection was complete, the transcribed notes were reviewed to identify themes, and highlight complementary and conflicting sentiments as they relate to the viability of livelihood for informal collectors and the inclusivity (or exclusivity) of informal waste sector by municipal governments. The interview transcriptions were coded manually using Google Documents. I read each transcription in synchronization with the audio to confirm accuracy and to also begin to pull out highlighted quotes. Highlighted quotes were quotes that addressed some part of the research question. While reviewing each interview, I also took note of quotes that support or refuted knowledge captured in my literature

review. Using the highlighted quotes and the quotes connected to literature, I began a new document that grouped similar quotes together. Initially, the coding was broad including "Georgia Specific", "Livelihood", "Challenges", "Benefits", "Relationship to the City", and "Weaknesses and Opportunities for Research". I then created sub-codes and separate codes that needed a separate designation including "Family Attribute", "Earnings", "Tactics for Worthwhileness", "Risky Unpredictable Logistics", "Rate", "Competition", "Beneficial Network", "Hard Work", "Diversion", "Not Profit for the City", "Keeping the City Clean", "Informal Unknowingly Support the City", "Rights to the City", "How Could the city Support Your Work", "Innovation", "Weaknesses", "Tires!", "Unincorporated Spaces", and "Leaving of Staying". From the sub codes, I considered theoretical frameworks and literature that was reflected in my codes, and these references guided the writing of my findings.

3.1.4 Recycling versus solid waste

Despite metropolitan Atlanta's mediocre ranking as a leader in sustainability, having been ranked 48 out of 105 cities by the United Nations Sustainable Development Solutions Network (Lynch et al. 2019), the region and the state of Georgia have some of the highest industry rates for recycling. Steve Levetan, a former lobbyist for recycling industries nationwide and current Executive Vice President of Pull-A-Part, a self-service used auto parts retailer and recycler, asserts that Georgia has some of the best markets for many of the commodified recycling materials such as iron, paper, aluminum, and plastic. Levetan says a key reason for this success is Georgia's distinction between waste management and recycling management. Georgia has the Regulated Metals Recycling Law (O.C.G.A. §§10-1-350 through 10-1-363) that regulates any person/ entity engaged in the paying/ compensation business for metal property.

> There are states that don't make the distinction the way Georgia does and a number of the other southern states, where we were very careful to get good, pro-recycling language into the solid waste statutes (interview with Levetan, 2019).

The Georgia law on recycling metals in combination with intense urbanization has made metropolitan Atlanta a favorable place for the informal recycling sector. In the metropolitan Atlanta region, the most common recycling industries are metal, pallets, and cardboard. Each industry has several actors that work within a network that fuels the recycling industry. These actors such as informal metal recyclers, recycling centers, and industry corporations, are intrinsically connected based on social factors including race, economic class, spatial proximity, and city policies. The intrinsic connection can be defined as a Heterogeneous Infrastructure Configuration (HIC), which connects people and things in socio-material relations that sustain urban life (Lawhon et al. 2018). Lawhon et al. (2018) also argues that HICs allows researchers to analyze spaces such as the informal recycling sector deeper than its technological and performative accounts. This research examines the informal metal recycling sector in Metro Atlanta to explore the significance of the sector beyond the technological and logistical components of the sector. The informal metal recycling sector is comprised of informal metal recyclers, recycling centers, and to a lesser extent industry. This research examines the role of the informal metal recycling sector in Metro Atlanta as indicative of broader processes of waste management, and I have defined the various actors of the sector in Figure 3.

Figure 3: Actors in the Informal Metal Recycling Sector in Metro Atlanta

Name	Other Names	Description/Role
Informal Metal Recyclers	Informal waste collectors, waste pickers, recyclers	Informal waste pickers are self-employed individuals that collect metal materials from various sources including

		sidewalks, apartment complex, construction sites, and industrial sites to take to recycling centers for money.
Recycling Centers	Recycle centers, scrapyards	Recycling centers accept metal from informal metal recyclers in exchange for money, which is determined by a scale. The recycling centers handle most pre-processing (separations, bulking, etc.) of metals to be sent to industrial companies.
Industry	remanufacturers	Companies that receive the end of life materials to remanufacture into sellable materials.
Waste Haulers	--	Contracted by the city

Through this case study on informal metal collectors and recyclers in metropolitan Atlanta I uncovered the importance of informal waste collectors in urban spaces, despite the fact that their contributions to materials management is often overlooked by formal institutions, who admitted by interview that they were unfamiliar with the informal waste sector. As I recounted above, other researchers have highlighted informal material sectors in Majority World countries (e.g., Adama 2012; Fergutz, Dias, and Mitlin 2011; Nzeadibe & Mbah 2015; Thieme 2010), which presents a different set of concerns than that of metropolitan Atlanta. The Atlanta region has a waste industry dominated by the formal waste infrastructure, where the presence of the informal waste industry is mostly overlooked, especially by government and, to some degree, the public. The invisibleness or unseenness that the informal metal recyclers experience, creates challenges within their work. Below I analyze interviews with actors in the informal metal recycling

industry in metropolitan Atlanta, to examine the significance of the informal waste sector in a Minority World country.

4 FINDINGS

4.1 Benefits and Challenges

4.1.1 Precarity

Despite the fact that metal recycling is the most common form of recycling (Wright et al. 2012) and the most effective (Knapp 2016), work of the informal metal recyclers in metropolitan Atlanta is precarious. There are many complexities to metal scrapping that make the work both challenging and worthwhile, and, identifying ideal sources for metal materials is a calculated approach that can render fortunate or unlucky results. Lee et al. (2015: 12) discuss the "unpredictable logistical cost" that informal material collectors endeavor in an effort to maximize their profits.

The informal metal recyclers that were interviewed for this researched seemed to acknowledge the precarity within their work; the recyclers assert that there is a narrow opportunity in which their work can be viable. Reginald, who has worked on and off in the informal metal recycling sector for 16 years, defines the precarity as the 'misadventures' of metal scrapping, where things can go awry.

> Prices going up and down, so like I said, some of the misadventures of the scrapping business [are] the knuckleheads you run into out here in the street, wear and tear on your vehicle [and] expenses with that, having to keep a good shade tree mechanic, and having to learn how to do things on your own to keep it going (interview with Reginald, Informal Metal Recycler).

Considering the effort put into collecting scrap metal, including scouring street by street for materials, breaking materials down to separate the types of metals, hauling them to a recycling center, and sorting them onsite, the financial reward of the effort it takes to recycle scrap metal is sometimes bleak. Reginald stated that there is "a lot of things that you have to deal with to make it even worthwhile"; such as, competition, car maintenance, weather, and fluctuating prices, to

name a few. Fergutz et al. (2011) point to increasing demand for employment and the fierce competition for recyclable materials as contributors to waste pickers' uncertain life and working conditions. The competitive nature of the work was pointed out by the recyclers that participated in this research.

4.1.2 Competition

In addition to the precarity of informal metal recycling, informal metal recyclers are also dealing with competition as more people see the value in recycling metals. William, a 54-year-old man who has been working in the recycling business for 14 years, asserts that he has seen an increase in the number of people involved in the informal metal recycling sector.

> Back in the 90s everybody wasn't into it. Everybody wasn't doing it like they doing now—you got people pushing buggies, walking… back then a lot of places you can go get [scrap metal] from like these big businesses and they would give it to you and you haul it and you get them something out of it. But now [big businesses are] hauling they own stuff or either they call the [recycling center] to bring them a dumpster and put it in there. (Interview with William, Informal Metal Recycler)

William discusses changes over the years, that have led industrial and construction companies to see the value in recycling metal; industries that use to be available to William for collecting metal are now salvaging their own metal to recycle. Samuel, an informal metal collector who collects on foot by pushing a shopping cart along to fill with metal items, says that he has had sources of cans in the past that were suddenly cut off because the business (the source of the cans) wanted to take the cans for themselves to make extra money.

> That security guard over there, he said 'You know I let you get those cans over there, some of these people make 15-20 dollars an hour, and they won't let you in the gate and they want to keep it for themselves.' I said, 'Man that's dirty!' (Interview with Samuel, Informal Metal Recycler)

Samuel has been refused metal cans from people making hourly wages, because the employees were interested in collecting cans for their own benefit. This is unfortunate for recyclers who may depend on specific sources of metal to aid in their livelihood. For many of the informal metal recyclers, recycling scrap metal is not enough to make a living; however, it helps the recyclers to secure housing, obtain cell phone plans, and buy gas. Gordon shared that you could make enough money in a single week to afford a weekly room rental, and Gordon also shared that having extra money allows him to put minutes on his phone. William, Carlton, and Miss Lizz discuss using their earnings to fill their trucks up with gas. Being able to meet basic needs is at the essence of what informal metal recycling offers to many of the recyclers I interviewed. The ability to meet essential needs is sometimes jeopardized by the instability of the per pound rates that the recycling centers set for each metal type.

4.1.3 Rates

Informal metal recyclers determine the earning of their effort at the scrapyard. The unstable rates the recyclers receive from the scrapyards and the scrapyard's ambiguous process of not showing the scale amounts to recyclers, make the "weigh-in" of materials a defining moment to determine if the hustle is worth the hassle. At the time of this research, many of the informal metal recyclers commented that the metal rates were significantly lower than normal.

> Well, I've seen changes of course prices go up and down which is a roller coaster. Especially, I guess, in times of war or if any particular industry needs more steel, then prices will go up. But if not, you know, they generally tend to stay lower and fluctuate, and I know it's been a rough stretch the last couple of years. (Interview with Reginald, Informal Metal Recycler)

Reginald points to demand as a reason for shifts in the recycle rates of metals. One informal metal recycler questioned why he continues to bother with the industry since the rates are so low.

> Oh, man. There was a time when we were recycling the cans and they were 55 cents a pound. Now it's gone all the way down to 30 cents a pound. That's the lowest I ever seen it in the last 10 years. Now why is that happening? I don't know, and I still fool with them damn cans. I don't know why it just give me something to do. It ain't about the money. It's just something for me to do to help make my day. (Interview with Gordon, Informal Metal Recycler)

Gordon states that the rates are at one of the lowest points he has ever encountered, and yet, he continues to recycle metal because, for him, it's more about participating in an activity than it is about money. Some informal metal recyclers question whether they should continue picking up scrap metal because of the low margins and low rates; other recyclers have already stopped taking metal to the scrapyard and are stockpiling their metals until the rates increase again. "Right now the metal done went down to two and three dollars. It was frustrating a lot of people so they stopped working until the scale go back up," says Miss Liz, a female informal waste recycler, who will pay other recyclers for their scrap metal when the other recyclers are unwilling to visit the scrapyard due to low prices.

Depressed raw material prices (Hagelüken et al. 2016), policy and legislation, pre-consumer demand, logistics and other factors that span between collection, pre-processing, and end processing of recycled metals, impact the rates (Reck & Graedel 2012). Several of the recyclers bring up war as a possible reason the rates for recycling metal would increase again in the future. Miss Liz jokingly talks about the prices going up because of the war.

> Normally [Pirkle Inc. is] the highest one; it pay[s] $4.50 [per pound]. Any other place is doing two and three dollars. [The rates] normally be like seven and eight and nine dollars when it's first going up. It ain't went up yet. They tell us is gotta be a war before it goes up. [Laughs] (interview with Miss Liz, Informal Waste Collector)

Another informal metal recycler, Carlton, who is a retired military veteran with an interest in military affairs says that he believes the prices will increase soon because of recent military news.

> I think that it's going to go back up, because I'm a retired military and I look at the military news. They're getting ready to build a lot of equipment for the military, and it's going to take a lot of scrap metal, and they say when it's a war going on, it's extremely high because they can use it; they can use all the metal for tanks and weapons. It's going to start real soon because I can see it. (interview with Carlton, Informal Metal Recycler)

The connection to war is reflected in the history of recycling. Recycling initially became an expectation of municipal solid waste infrastructure in the 1930s during World War I, when wartime governments put pressure on municipalities to enforce stricter recycling measures (Cooper 2008).

Abby Goldsmith, a consultant for state and local government on solid waste planning, funding and procurement, also acknowledged the low recycling rates.

> Prices are lower than they've ever been, and they've stayed lower for longer than they ever have, which changes the whole economics of whether or not you make the decision as a local government or as an individual or someone in the informal waste structure. The whole decision whether or not to pick something up for recycling or recovering or disposing of it… I do think it's a challenge to rebuild our whole recycling versus disposal model on the current economics. We're just not going to recycle a lot in the long term if it is not economically feasible, and right now recycling costs money and landfilling—certainly illegal disposal—is really inexpensive (interview with Abby Goldsmith, Consultant).

Goldsmith stated that it may be difficult in the future for the recycling economy to continue particularly because it is much cheaper for a municipality to landfill materials than it is to recycle. Kanika Greenlee, a city official for the City of Atlanta who oversees the municipality's recycling program and solid waste administration, mirrors Goldsmith's concern about municipalities recycling in the long term.

> Talking to a small City in Metro Atlanta up north, Sugar Hill, Georgia, you know, if their cost goes up a thousand percent for recycling, they really have to decide are we going to keep this recycling program? Because they can't absorb those shocks and those processing fees and costs and those major impacts. I think that's the biggest challenge. (interview with Kanika Greenlee, Executive Director of Keep Atlanta Beautiful Commission and Environmental Programs Director for the Department of Public Works-City of Atlanta)

Greenlee acknowledges that small cities, like Sugar Hill, Georgia, may have to discontinue recycling services if the rates continue to increase. The inconsistency and record low rates in the industry would seem to deter people from collecting scrap metal, however, there are many benefits from the work that make many recyclers actively collect and sell scrap metal.

4.1.4 Freedom

Despite the challenges that informal metal recyclers experience, there are many benefits to collecting metal for livelihood that make informal metal recycling worthwhile and significant to the city. One of the most apparent benefits of recycling metal informally is the freedom and flexibility that comes with the work. KW, a recycler who has physical issues with his back is grateful for the flexibility of the informal waste sector.

> I do [scrap metal recycling] but I know I can't work because I can't go on nobody job because they gon' want me to move in a way that I can't move anymore... I be like "I'll see y'all Monday, then I will see y'all Thursday" 'cause I know I need to take a break. (interview with KW, Informal Metal Recycler)

KW, who only started scrapping one year ago, says that because of his back, being employed by a company would be a challenge because of his inability to do strenuous physical work. Working in the informal recycling sector allows him to decide when he will return to work if his body requires rest before beginning another day of collecting materials. Reginald echoes KW's appreciation for the flexibility in the informal sector.

> Freedom, independence, not having to deal with office politics or work politics as much. Being your own boss [and] not having to brown nose. To a certain degree you will have to do that to get what you want out here too, but just far less. I think that's probably the biggest advantage next to it being non-taxable; it's like wide open, free income. (interview with Reginald, Informal Metal Recycler)

Reginald talks about the freedom to choose the relationships he fosters with other people in the informal metal recycling industry. For some, freedom comes in not having to complete strenuous work that may compromise their physical health or having the freedom to choose who they want to build work relationships with. For others, collecting scrap metal for recycling is a resistance to power. Gordon, a 58-year-old informal metal recycler, discusses the liberties of deciding his own schedule.

> See, I [worked for] Greyhound Bus Station for 20 years. I worked a long time, so I don't have time, for anybody telling me what to do no more. Either you going to let me work for you and I'm going to work according to how you want me to work, or I don't show up at all... That's how I picked up scrap metaling, I work at my own pace and at my own schedule. It's something for me to do, and it relaxes my mind. Don't have me all stressed out. (interview with Gordon, Informal Metal Recycler)

Gordon's past as a formal employee of a bus company has allowed him to appreciate informal work, which he says allows him to work at his own pace and without stress. The same resistance of power is echoed in Thieme's (2013: 389-391) ethnographic research on the youth recyclers in Nairobi, who live by the phrase *tunahustle*, "we hustle". The research describes the youth's hustle as an "implicit critique of the state's failings", where they do not acknowledge authority. These are the same *lumpen* people that Nwosu et al. (2016) pulls from Frantz Fanon's writing, as a group awakened to the intrinsic benefits of life outside of the formal.

In addition to the above benefits identified through this research, minor benefits to informal metal recycling is exercising one's body (and potential weight loss). Reginald admitted that metal recycling work keeps weight off of him. Gordon recognized his frequent walks,

picking up metal over the past 11 years, as a form of exercise. Walking also impacts his mental health and proves him an environmentalist: “So it's no big deal to me. It does good for my health. Peace of mind,” says Gordon. The significance of the informal recycling sector is apparent in the benefits the work offers to the recyclers health in addition to supporting their finances, helping a large network of people, and decreasing the impact on the planet.

4.2 The mobility of waste as a socio-technology

Informal metal recyclers are a familiar attribute to the backdrop of many cities, often seen riding around town with a bouncy load of metal pipes, appliances, and fixtures, or pushing a cart overloaded with large plastic bags full of cans. Even in an urban setting in a Minority World country such as metropolitan Atlanta, the informal material recycler is embedded into the makings of urban place. Informal metal recycling is significant to Metro Atlanta because of the ways it supports many actors in the industry with livelihood. Not just for collectors, but also employees who work at the recycling centers, and the ‘sub economy’, which one collector describes as a group of people that benefit from the items picked up by the informal recyclers. This network of beneficiaries from the informal recycling sector are engulfed in what makes informal material recycling in metropolitan Atlanta a socio-technology.

4.2.1 Consumer Patterns

Discarded goods, whether from an individual consumer or a construction site, are the ‘bread and butter’ of the recycling industry, and an input of the socio-technology. Common items collected by metropolitan Atlanta informal metal recyclers include appliances, metal pipes, gutters, metal fixtures, cans, batteries, in addition to non-metal items such as functioning electronics, antiques, furniture, and money. The “throwaway society” that Cooper (2016: 710) discusses is a society hooked on production of goods and an appetite for novelty. The informal

recycling sector is a remedy for the throwaway society, which fuels the ‘sub economy’, where people live off of the discarded goods of others. As Reginald asserts, there is

> the sub economy of selling your reusable junk; a lot of stuff [is] brand-new. People for whatever reason have to get rid of some things; people die, go to jail, and new stuff is put out. Rich people who live over by Grant Park; if the[re are] scratches on the refrigerator, [they] get another one. [The refrigerator] is perfect six months old and you [are] helping [the] underground economy of these flea market people… I don't know how much stuff I’ve given to homeless people, or prostitutes, or people that you see out in front of the plaza over there on Cascade. I'll just help out people who need microwave ovens or women when I find purses… Canned food and stuff I might take the homeless dudes, you know, so everybody knows me coming through. (interview with Reginald, Informal Metal Recycler)

Reginald sheds light on the underground network that benefits from the functional, usable, fashionable, edible, and sellable items that come from the throwaway society. Nzeadibe et al. (2012: 355) affirm this relationship stating that informal metal recyclers are those “whose livelihoods depend entirely on access to a continuous supply of solid waste”. The patterns of consumerism are not only tracked by collectors driving through wealthy neighborhoods, they are also tracked by waste collectors who primarily collect cans on foot. These collectors talk about the increased generation of aluminum cans in the summer and during the winter holidays when drinking behaviors are at a peak.

> According to the weather, like now the season finna change… You ain’t going to find that many cans, once it gets cold out here. Now, probably during the holidays; Thanksgiving, Christmas, and New Year’s, you might have found a few of them ‘cause people gonna be partying but after that, ain't nothing. (interview with Gordon, Informal Metal Recycler)

Consumer patterns are important for the informal metal recyclers to follow in order to seize maximum materials for recycling, and many recyclers have adopted a specific approach to how they capture scrap metal.

4.2.2 Tactics for making scrapping worthwhile

The informal metal recyclers insist that knowing the business is a critical need for being able to make the work worthwhile. The informal recyclers are the experts of material flows on a

microlevel, and their contributions helps to maintain the industry's momentum. Lee et al. (2015: 1) describes this deep understanding of their terrain as "useful tacit knowledge about urban form and activities in the areas they serve". In an effort to better understand the waste workers' knowledge, Lee et al. (2015) documented waste worker movements in Mombasa, Kenya, to track the patterns of the informal waste pickers; the researchers were able to see that the informal material recyclers preferred to work in spatially dispersed communities in order to maximize profit. Furthermore, the waste pickers visited restaurant clusters multiple times a day. One common tactic for the informal metal recyclers in Metro Atlanta is knowing the trash pick-up days for various municipalities. This schedule allows the collectors to beat the municipal waste hauler to potential valuables set out by residents. Informal waste collectors interviewed for this research offered insight into their own methods for maximizing profits.

> I've studied Atlanta. I know it like the back of my hand. You have to know what are the trash day pick-ups, when people normally have the habit of putting stuff out… it was crazy trying to figure out those rhythms and to maximize would be more efficient, but you have to know all that then you have to get to know people. You get to know habits, get to know what areas are being renovated, gentrified, and know where construction sites are. (interview with Reginald, Informal Waste Collector)

Reginald bases his sources of metal on the rhythm of the formal waste structure, and he also is aware of areas with hyper-construction activity such as areas undergoing gentrification. Reginald attempts to understand the metal recycling terrain in metropolitan Atlanta to improve the efficiency of his earnings. Other informal waste recyclers take a less strategic route, but still maintain a method to their metal collection approach. For instance, KW, who recycles metal for non-essential expenses, will limit his route to Southwest Atlanta, citing gas prices as a reason. William, who oftentimes drops off metals for other people and not for himself, stockpiles his metal valuables in his backyard until he feels he has enough metal worthy of a trip to the

scrapyard. Gordon, who collects metal on foot and recycles in tandem with other jobs, walks around Piedmont Park to pick up metal valuables he can lug on foot. Samuel, who pushes a buggy around to collect valuables, usually receives calls from friends that have items for him to recycle. Miss Liz and Willie have identified approximately seven go-to multifamily units that they visit throughout the week to collect materials to recycle.

> Everybody got certain picks, so like me and him, when we go out, we got like six/seven different units we go to and we pick up. We go from the one over here in Dekalb County, then we head from 'Kalb county and head to Metro Atlanta, leave from Metro Atlanta, go to Bankhead then Roswell. Them our lil' spots… they probably got four/five freezers, washers, appliances, metal furniture, stuff like that. (interview with Miss Liz, Informal Metal Recycler)

Miss Liz's shares her routine for collecting metal, and Miss Liz's strategy confirms the local knowledge she has acquired over the past 16 years, that has allowed her to identify a set number of places to visit frequently, where she can find meaningful sources of scrap metal. The tactics that informal metal recyclers have adopted are an example of the local epistemologies that Leitner and Sheppard (2015) discuss, where the ecosystem of knowledge production expands throughout the network.

4.2.3 Beneficial network

Another significance to the informal metal recycling industry is the network of economic movement generated by providing resources including gigs, home goods, and food to other people. One example of the reach of the informal recycling network is the one-off jobs that the informal metal recyclers can offer to other people. KW, who has back problems that may prevent him from collecting heavier items, will identify someone one in passing who could help him load large appliances onto his truck for a couple of dollars. In another scenario Miss Liz, who typically works side-by-side with her partner, Willie, will choose not to work some days to give

another informal metal recycler a chance to work with Willie and make money. “We have some of them ask us for work. Sometimes he need an extra hand or something. We will let him go, and I’ll be like “I ain’t gon’ go today’,” Miss Liz says. The extension of personal earnings to others is also a practice of KW, who takes a similar approach to Miss Liz by giving additional money to the informal waste collectors that push carts. “They need something, and I throw them something… If I see somebody come on over there with a with bags and they give them $8. I try to put some with it,” KW says.

The solidarity among the informal metal workers is acknowledged by Thieme (2013), who found in ethnographic research of collectors in Nairobi that the workers’ solidarity with each other outweighed their self-interests. In other cases, some of the informal metal recyclers will hire themselves as ‘drivers’ for other informal metal recyclers, who do not have a vehicle to drop off their scrap metal to a recycling center. KW hires himself out for additional work driving his truck for other people when his back is not in good enough shape to handle large, heavy scrap metal. William does not actively pick up metal for himself; instead his main role in the informal metal recycling industry is hauling metal for other collectors.

> I don't even mess with [scrapping] myself. Sometime[s] I might go two, three, four months or just let it sit there. Like I said some of them don’t have jobs. Some of them [are] homeless, and they [are] picking up stuff and they pile it, and they want me to move it. And sometimes it be a couple of weeks or a month before they have something…. I don't mind helping peoples and I love to do stuff to get honest money. Every little bit counts. (interview with William, Informal Metal Recycler)

William finds that being paid to haul other people’s metal is more beneficial for him, than collecting and hauling his own metal. The informal metal recyclers have a significant network that spans beyond their industry, and many of them attribute their recognition to their hard work.

4.2.4 Hard work

A general theme that appeared with many of the informal metal collectors is their emphasis on being a hard worker. There appears to be an unmentioned praise that is attached to how hard one can work. Lawhon et al. (2018a: 1116) describe this as "the modern productivist work," where colonial powers have convinced colonial subjects that work is virtuous and worth more than its productive value. This work is believed to give respect, decency, and dignity to the employed, and stigmatizes the un- and underemployed (Lawhon et al. 2018). KW talked about his diligence to keep areas clean after he has searched for metal. He brags that he is 'good at working,' and uses his childhood memories working in his father's garden as synonymous to working in the informal metal recycling industry: "My dad had us working in a little garden. Boy, we used to hate that garden. It was small but it taught us discipline, how to work," KW says. That same approach of teaching discipline that KW's father taught in the garden, is what Miss Liz teaches her grandchildren.

> I take them with me sometime and make them load and see what hard work is. They participate when they want some money. They be like "Grandma, I need some money" I be like "Come on, let's get in this dumpster." I pay 'em like I would pay myself. (interview with Miss Liz, Informal Metal Recycler)

This hard work is also described in bell hooks *Sisters of the Yam*, where hooks talks about the joy Black people feel when completing hard work.

> "Work make life sweet!" I often heard this phrase growing up, mainly from old black folks who did not have jobs in the traditional sense of the word. There were usually self-employed, living off the land, selling fishing worms, picking up an odd job here and there. They were people who had a passion for work. They took pride in a job done well. (bell hooks, *Sisters of the Yam: 41)*

The individual commitment to hard work is a factor that drives the socio-technology configuration of the informal recycling sector. Many of the informal metal recyclers interviewed

for this research admitted that they doubt they could ever completely stop collecting metal; they argue that once you know the value of something, it is difficult to leave the item behind. That same insistence of hard work is reflected in William's explanation of collecting metal in a small vehicle not designed, nor ideal, for large and heavy loads.

> I had a Honda Accord. I hauled several thousand pounds. I shouldn't have put that much in the car, 'cause the car was sitting real low, but I brought it and hauled it to the scrap yard in my car, 'cause my truck wasn't running at the time... Sometimes you have to sacrifice to live and survive in this world. You can't survive if you don't get up and try. Ain't nobody giving you nothing. Don't nobody come and knock on your door no more and say 'here.' Ain't nobody going to bring you anything so you gotta get out there and make it happen. (interview with William, Informal Metal Recycler)

William acknowledged that although it was taxing on his small car, it was necessary, because he is responsible for his own livelihood. William is describing the need to experience extreme circumstances, and even jeopardize the condition of his car in order to make money. The hard work mentality is akin to the heroic entrepreneur that De Soto (2000) describes as a self-made response to the state's incapacity to meet the basic needs of people. Heroic entrepreneurship has the ability to further disconnect the state from offering services citizens (Roy 2005). In spite of the risks, 'Making it happen' is an approach many of the collectors take due to necessity. Necessity is what has prompted some of the collectors interviewed for this research to initially start or continue informal metal recycling throughout the years.

> Right now the only thing really motivating me is necessity, having to supplement what I'm doing now, because what I'm doing is irregular. Projects ending at a point and trying to time it together with everything else, so it's a necessity right now, but once I get more control of my financial situation where I want it to be I can see myself of course playing with it. (interview with Reginald, Informal Metal Recycler).

Reginald also discussed having to leave his job in Atlanta in the early 2000s and temporarily move to Macon to take care of his father. His move to Macon prompted Reginald to start recycling waste informally. Informal metal recycling is work forced out of necessity, and it

signifies the need for informal work in a Minority World country. The significance of the informal also expands into the environmental benefits of informal recycling.

4.2.5 Environmental trailblazers

Another benefit of the informal recycling sector is the connection to the rising global 'green' trend. As the Green New Deal hatches in discussion around the 2020 U.S. presidential elections, the informal waste sector has had an ongoing record of minimizing climate impacts while also maintaining jobs for marginalized groups. Medina (2007: 389) contends that the informal recycling sector could be "a perfect example of sustainable development, because it touches on the three pillars of economic sustainability: social, environmental, and economical." Knapp (2016) proposes the term flexible mine to describe the convenience of above -ground mines, commonly known as scrap yards, where informal metal recyclers drop off their metal. Flexible mines address the three main problems of traditional or underground mines including geospatial fixity, resource scarcity, and environmental effects (Knapp 2016). Recycled metal also contributes to less carbon and sulphur dioxide emissions, and less energy usage in comparison to mining virgin metal materials (Wright et al. 2002).

The informal metal recyclers acknowledge the growing interest in circular economies, although they do not name them in that way. Reginald talks about how the new wave of green consciousness has made his work as a metal scrapper more palatable to society.

> That whole green movement, people becoming more used to it and even on DIY shows you'll see people calling it 'repurposed' stuff. I guess 20 years ago, we still looked down on those and more so now, everybody's catching on. Come on, let's get real, this stuff is still good, this wood is still good; you can reuse it, it makes sense. So it has changed, and I would say probably now it's 50/50, people who look down on those, and people who recognize the value of what you do. (interview with Reginald, Informal Metal Recycler)

Reginald says the informal recycling sector has become somewhat favorable in society, because of the value the industry offers to the environment from a decrease in natural resource extraction to keeping environments clean.

4.3 Waste collection is essential to society

Many of the informal metal collectors interviewed for this study expressed their knowledge of their value to a city. Researchers agree that informal material recyclers help to keep cities clean (Fergutz et al. 2011). One of the informal metal recyclers interviewed for this research talked anecdotally about the risks to a city's appeal without the collectors' continuous collection of materials.

> Most people generally look down on you dealing with trash, but a lot of people need your services. I think people generally understand, [when] you start putting refrigerators and stoves and stuff out on the sidewalk, it'll be like it was in the 60s and 70s, when there used to be trash everywhere. Nobody was picking up stuff too much… but I think generally it's a large portion of the public that understands the importance of what we do to help the city remain clean. (interview with Reginald, Informal Metal Collector)

Reginald is referring to an era when cities experienced disinvestment due to 'white flight' and the expansion of suburbs. During this time of neglect in the city, an American sitcom, *Sanford & Son*, in which a father/son team ran a junkyard, salvaging and selling discards collected around the Los Angeles area, became many people's significance and familiarity of the informal recovered materials industry. One informal waste collector, William, identifies that show as a possible reason for today's social acceptance of informal waste recyclers.

> You know, Fred and Lamont they made a living off of this. [laughs] Fred and Lamont, I think they the ones that started the scrap business, cause they had plenty of it around their place (interview with William, Informal Metal Recycler)

Social acceptance in the Minority World is contrary to what is perceived in Majority World countries where the informal work is inferior and the global hierarchy of the economy is difficult

structurally and socially for formerly colonized countries to create industries that are endogenous, non-extractive, and circular.

4.3.1 Helping family

In metropolitan Atlanta, a city in a Minority World country, informal workers' essence to society can be seen not only from the exterior world, but among their most intimate network, their family. Much like the on-screen duo's, *Sanford & Son*, perceived heroism from their audience, informal metal recyclers identify as real-life heroes to their families. KW says the money he makes from metal recycling does not go towards his monthly expenses but rather allows him extra cash to give to his wife and grandchildren, which warrants him praise.

> It don't pay for none of my expenses; none of it. [Earnings] just keep them grandchildren off me, keep that wife off me. I don't have to go in my pocket, so I can be, be that man when I come in that house. I get theme music, you know what I'm saying? (interview with KW, Informal Waste Collector)

Miss Liz also talks about her ability to be able to support her grandchildren when their parents are unable, and how her grandchildren are learning the benefits of informal metal recycling by working alongside her to earn money.

> Them [children] be like "Grandma you keep going in the dumpster." I be like "That dumpster help y'all eat. That dumpster help get clothes. That dumpster buy them shoes you got on." … I take them with me sometime and make them load and see what hard work is. They participate when they want some money. They be like "Grandma I need some money" I be like "Come on, let's get in this dumpster." (interview with Miss Lizz, Informal Waste Collector)

Miss Lizz supplies some of her grandchildren's essential needs by depending on items she collects from dumpster.

4.3.2 Earnings

For informal waste collectors, aside from the offerings they are able to give to their grandchildren and wives, the earnings from metal scrapping are used for everyday expenses and

saving for monthly bills. Most of the recyclers do not keep rigorous track of their earnings but rather put the money where it is needed most. Reginald states that "[I] don't really itemize it or keep track of it like that. You just throw it in the pot and take care of life." William says the money helps him to take care of most pressing financial needs. "I take [the earnings] and put it into my tank. I might stop and buy a few items for the house with it, or I'll just save it and add that to the collection to pay bills," William says.

When asking the informal metal recyclers if they consider metal scrapping a job, the participants in this research give a resounding 'no.' This 'no' is also echoed in the literature. Nwosu et al. (2016) states that the livelihood of informal waste pickers is unstable. Nzeadibe (2012) completed a quality of life assessment on informal waste collectors in Aba, Nigeria in which the research suggests that the collectors experience significant vulnerability. The recyclers state that the metal recycling is not enough to sustain their livelihood. Samuel compares informal metal recycling to hunting stating that you're not paid as if you have a job. "You not getting paid like you work on a job. [laughs] So I don't call that no work. I call that 'hunting' or something. Hunting, looking for something that you can go sell," Samuel says.

A large emphasis on metal scrapping not being real work is due to the small margins informal recyclers are able to squeeze from their efforts. William says that unless a collector is able to pick up an ample amount of metal, then the work is not worth the hassle. "If you ain't got somewhere that you [would] being able to pick up bigger bulks, then it wouldn't be worth it," says William, who mostly hires himself out to haul for other collectors rather than actively collecting his own scrap metal.

4.3.3 Full time work

Although relatively rare, some collectors depend solely on metal recycling to make a living. After interviewing eight informal metal recyclers, three of them admitted that recycling scrap metal was their main source of income at some point during their time as informal recyclers. Miss Liz and Willie, a metal scrapping duo, talk about metal recycling as a 24/7 job. Miss Liz states, "in order to make money you gotta stay on the grind. This a 24/7-day job right now. This an 'always' job." This 'grind' approach to metal recycling is akin to what Thieme (2017) found when completing ethnographic research in Nairobi by engaging in waste work as an apprentice. Thieme (2013: 389) adopted the language of the waste workers, which included the waster workers' self-proclaimed 'hustler' identity, which Thieme points out is an accurate description of their work, where the 'hustlers' "tackle the vicissitudes of urban poverty and the fragile balance between hope and despair." Although Thieme's research was completed in a Majority World country, informal material recyclers in Minority World countries have a similar approach to their work. The duo, Miss Liz and Willie, allude to a similar mindset and approach within the Minority World. Miss Liz says that she and her partner often travel far lengths from Bankhead to Roswell seeking out metal, and she also states that although it is laborious, there is always money to be made. "We be out here from like seven in the mornin' to close [of the recycling center]. Just like a job seven in the morning to close and you wait to get yo' money," Miss Liz says. Miss Liz continues to collect because she says she is certain she will make money.

> You know you getting some fo'sho money and ain't nobody giving it to you. You know know you gettin' some fo'sho money. Even if it's fifty dollars, twenty dollars even twelve dollars, you getting some money. So if you take that, like me and him, what we make today in all of the day before we got here and dropped this load off, we made like forty-five dollars. So that's a whole day of work. (interview with Miss Liz, Informal Metal Recycler)

Another informal metal recycler, Reginald, has worked both full-time and partially in the metal recycling industry for 14 years, and he talks about a time when he could depend solely on metal recycling, when the metal rates were high and he had a large pickup truck.

> There was a time when I had a Silverado [and metal recycling] was my mainstay, I guess, from 2005 until 2008, and I could tow cars and do all that kind of stuff. I had a big enough bed in the truck to get an ample amount. So [during] that period that's all I did to make it but other than that, it's just been supplement. (interview with Reginald, Informal Metal Recycler)

Reginald talks about better days, when the informal recycling sector was viable, full time work, but shifts have made full time metal scrapping nearly impossible.

4.3.4 Other jobs and something to 'do'

For many informal metal collectors, hauling scrap metal is supplementary to other forms of income. Main sources of income for the recyclers come in the form of a disability check, social security, Veterans pension, or through work in close proximity to the metal recycling industry. For instance, William, who works in construction and asphalt, says he will spot scrap metal while on a job, and ask if the materials can be taken. Another collector, Gordon, explained a self-designed schedule of juggling metal scrapping, car washing, and cleaning in one week.

> I do other jobs instead of picking up cans; that's just one of my little jobs to give me something to do. Now see today Monday, I [recycled] today. Now tomorrow I might be at my car wash job in Stone Mountain washing cars. I might do that for 2-3 days; that's easy. Then when I get tired of that, I go to my other job cleaning up my man's business for him. That's easy money. My benefits come in every month. So I ain't gotta worry 'bout no money. I do what I do. (interview with Gordon, Informal Metal Recycler)

Gordon has configured a cadre of jobs that allow him to make money and stay busy throughout the week, many other recyclers have a similar desire to stay busy.

Something to 'Do'

Other metal scrappers look at their participation in the metal recycling industry as just something to do. Samuel, who has participated in some type of material recycling since he was a

little boy, returning glass bottles to a filling station in downtown Atlanta 60 years ago, says that metal recycling puts a little money in his pocket for cigars, but mostly he continues to pick up cans because it gives him something to ‘do’. Samuel states, “I've been doing it all my life… I gotta do something, because, look, I can't stay still like that. So I always put stuff in [the buggy] and get back to the scrap yard”. Compared to Samuel’s 60 years recycling materials for money, KW has only recycled metal for a year; however, he offers the same sentiment about recycling simply being something to “do”:

> It’s therapeutic for me. [Metal scrapping] fills in that time gap. It’s some other stuff I could be doing, was doing, that I don't do no more. So [metal scrapping] fills in the gaps, occupying my time… It’s more like a hobby now ‘cause I like tearing stuff, breaking it up, getting out there and riding. (interview with KW, Informal Metal Recycler)

For many of the informal metal recyclers, the need to “do something” appears to be a distraction from more troublesome, criminal activities. Many of the informal metal recyclers interviewed for this research benefit from this work because it is legal, or what some of the informal metal recyclers refer to as ‘honest work’. William says he enjoys staying busy with work “I love to do stuff to get honest money, every little bit counts.” Gordon points out metal recycling work as something “legal” to do; he awaits his retirement check, collecting metal on walks from West End to Piedmont Park, and back, keeps Gordon out of trouble.

> I haven't gotten yet my retirement check--that's coming at 62, and until then I have to have something to do to occupy my time, or I might get into some trouble. I don't need to get into any trouble at my age. [Metal scrapping] can’t even buy me a decent meal, it’s just something to do for me, to stay busy and quit being bored. I don’t like being bored, so I'm a working man. I've been working all my life since I was 17. So I have to stay busy, keep my mind occupied. (interview with Gordon, Informal Metal Recycler)

The recyclers allude to participating in criminal activities in the past, and that collecting scrap metal is an alternative. The proximity to criminality is also captured in the body of literature

completed on the informal waste sector. Nwosu et al. (2016) describe the closeness of informal waste collection and criminal activity because of a lack of policy, and people being placed on the margins. In one example, Fergutz et al. (2011) described a case study of an informal waste worker in Poá, Brazil, who attempted a life of crime, but decided early on that it was not the life for him.

Another essential contribution the informal recycling sector makes to society is the potential earnings the informal recycling sector can offer to marginalized groups, including the homeless. Miss Liz discusses the benefits the metal recycling industry offers to people without homes in metropolitan Atlanta.

> [Metal Scrapping] keeps a lot of people out of the streets... It helps them out because basically they walking out there with a buggy and they'll pick up stuff. In Metro Atlanta you ain't gone too much find metal scrap 'cause [the homeless] be done got it. So it keeps them eating and stuff like that." (interview with Miss Liz, Informal Metal Recycler)

The informal waste sector is a configuration of individuals and entities that are connected by various social and technical factors. The informal recycling sector helps to keep the city clean, supports families, and offers an alternative to participation in criminal activity. The informal recycling sector is essential to society, and a significant part of the city—and yet, as I describe below, municipalities rarely—if ever—acknowledge the sector.

4.4 Waste collection is unacknowledged by municipalities

4.4.1 City neglect

Despite the benefits the informal recycling sector offers, much of the informal waste literature suggests that the informal waste collectors are explicitly unacknowledged in municipal policy (Nzeadibe 2009, Fergutz et al. 2011, Guberlet, Lane 2011). This is particularly true in Majority World countries, where the informal is criticized by authorities. Fergutz et al. (2011)

offered two examples of aggressive opposition of the informal waste pickers in Colombia. In one example, the waste pickers in Colombia, whose notable carts — *carrozas* —were banned from the streets of big cities. The second is an even worse scenario happens in the late 1990s when "social cleansing" groups would kill informal waste workers and then sell the bodies to a medical school at a prestigious Colombia university (Fergutz et al. 2011: 599). Nwosu et al. (2016) argue that the omission of informal waste management in policy is rationalized by the concept that informal waste management is closely linked to criminal activity. Because of the explicit neglect, the informal waste collectors in Majority World countries, have created cooperatives in an effort to be seen by their governments. In metropolitan Atlanta, where my research is situated, through policy, the informal waste collectors are encouraged to collect unwanted, yet functional goods; however, even this encouragement has implications that speak to a larger issue of race and class.

The informal material collectors in metropolitan Atlanta are mostly black and low income, the formalized recycling centers sited for this research were white-owned businesses. Many informal metal recyclers are challenged with their relationship to the metal recycling centers, also commonly referred to as scrapyards. Some scrapyard scales are not visible to the informal metal recyclers, which makes the collectors question if they are getting honest rates.

> I don't know how much greed has to do with it in terms of metal companies reaching the point where they want to gouge people for what they're doing for them. I don't know and then I've had instances on scales where it seems like it's not reading right, and I know that there are variations in scales where they can make it say whatever they want it to say. I wouldn't be the first one to say that they've had issues with people at the scale and wondering whether it's cheating us or whatever. (interview with Reginald, Informal Metal Recycler)

Reginald suggested the city as a possible monitor of scales to ensure the collectors are not being cheated by the recycling centers. He also recognized how the municipalities' input may infringe on the free market.

> The books aren't open to us, so we don't know if we're getting screwed or whatever and who can monitor the scale and make sure they're not adjusting them. If the city could control that aspect of [the informal waste sector], that would be great but I don't know how much that cuts in the free-enterprise.
>
> - Reginald, Informal Metal Recycler

Informal material recyclers in Brazil experienced similar uncertainties at the scale, where recyclers suspecting the scales were manipulated (Fergutz et al. 2011)

Fergutz et al. (2011: 602) suggest a "perverse solidarity" between intermediaries, such as scrapyards, and industry. The scrap metal industry generates a 500% percent surplus between collection and remanufacturing, with only 10% of the surplus being given to the informal metal recyclers, the rest of the revenue being absorbed by the recycling centers and remanufacturing industries (Fergutz et al. 2011). Similar estimates by the Association of Paper, Cardboard and Recyclable Materials Waste Pickers from Belo Horizonte (Minas Gerais) state that there is a 300% difference between the value of the services rendered by waste pickers to the city administration and the value of these same services in the market (Fergutz et al. 2011).

Based on the data collected for this research, the informal recycling collectors are unacknowledged by city officials. Although these incorporated cities benefit from the presence of informal material recyclers, the benefits including landfill diversion, cleaner cities, saving the city money, are not acknowledged and are often overlooked. In this research, city officials named landfill diversion, costs, and cleanliness as their biggest headaches with managing waste for the city, and the informal waste sector supports with each of those issues.

4.4.2 Landfill diversion and NIMBYISM

For many municipalities, the landfill has been a site of contention since its inception. Initially the landfill was a site of concern for health risks (Gregson and Crang 2015), and then the placement of landfills became a concern for the Environmental Justice movement after a hazardous waste dump was marked for opening near a predominantly Black community in Warren County, North Carolina. Landfills are an unfavorable solution to the waste problem. Landfills are one of the cornerstone facilities that sparked the Not in My Backyard Movement (NIMBY) in an effort to oppose locally-unwanted land uses (LULUS), which are facilities that may challenge the perceived physical character of an area (Whittmore & BenDor 2019). Landfills are still the prevalent infrastructure for waste management; however, there is also a growing trend of reducing landfill dependency thanks to surrounding communities and environmental concerns in general (Gutberlet 2012). In the United States, the Garbage Barge of 1987 became a symbol of a growing solid waste problem (Robbins 1987).

> There was an incident that sparked [the] proliferation of legislation around the country beginning in New Jersey, and that was the Garbage Barge. There was a barge load of solid waste garbage that was loaded out of New York, and it was destined for a landfill… somewhere in the South and it was turned away. That barge ended up being bounced from one port to another. It got turned away and it ultimately ended up in an incinerator in New Jersey, [which] led to a greater, awareness of the issue the lack of landfills or the shortage of landfill space or the perceived shortage of landfill space [and] the interest in keeping stuff out of landfills by recycling or by other means (interview with Steve Levetan, former lobbyist and Executive Vice President, Pull-A-Part, LLC)

Greenlee echoes this in discussing the unlikelihood of Atlanta opening up a new landfill in the future.

> When you purchase a landfill you get into that whole NIMBY factor and no one wants a landfill in their backyard, and historically landfills have been in poor and underserved communities. And so then you get into environmental justice issues when you think about that, and I don't know that we have the space in the city limits to open up another landfill, so we probably wouldn't open up a landfill. (interview with Kanika Greenlee, Executive

> Director of Keep Atlanta Beautiful Commission and Environmental Programs Director for the Department of Public Works- City of Atlanta)

With the troubles that come with landfills including the cost to dump and the backlash of opening new ones, figuring out how to divert waste from landfills is a major priority for large cities like the City of Atlanta. Unlike smaller cities, the City of Atlanta, manages its own fleet of waste collectors, trucks, and collection schedule, and then the city pays a fee to utilize transfer stations and landfills owned by external companies. Because the City of Atlanta outsources at the transfer station, Greenlee comments that the Department of Public Works has to monitor the costs incurred through outsourced services.

> There's other factors with landfills and increasing rates and those sorts of things that you have to factor in and some things are in our control, but some things aren't… We don't own our own landfills or transportation transfer stations. So we're really at the whim of what the market dictates and we have no control over it. (interview with Kanika Greenlee, Executive Director of Keep Atlanta Beautiful Commission and Environmental Programs Director for the Department of Public Works- City of Atlanta)

As a public works department for an incorporated city, some of the costs can be controlled, but the external services, such as tipping fees— rates paid by haulers to landfills— are outside of the city's control.

Another factor about diversion outside of the tipping fees is the finite space in landfills which, if waste generation tonnages are not curbed, could result in running out of landfill space.

> Making sure that we're looking at other things in our waste stream other than recyclables and trash and yard trimmings. The two biggest things left in a waste stream are food and Organics and then clothing and textiles. So, you know, we're looking at ways of how we can divert those things, which ultimately will decrease the tonnage of what we're disposing in a landfill. (interview with Kanika Greenlee, Executive Director of Keep Atlanta Beautiful Commission and Environmental Programs Director for the Department of Public Works- City of Atlanta)

Greenlee asserts that the City of Atlanta is looking to adopt organic waste and textile recycling at the curbside in an effort to divert the amount of waste that goes to the landfill. A similar approach is being taken in another urban area within a Minority World Country. In Melbourne, the Victorian government is taking a new approach to discarded materials, rather than seeing those materials as waste; the municipality recognizes waste as a resource. Much like the City of Atlanta, Victoria's effectiveness will be measured by the city's landfill diversion rates (Lane 2011). However, how these initiatives may impact resident taxes or benefit the community is unknown.

> That's the one thing that we can help control is the diversion of the market. I can't control how much landfill space we have. What we have is what we have, and you know landfills take about 10 years to come on… We don't have ultimate space to house all of the waste that we generate, and so we have to look at, you know diverting it, reusing it, reducing it and other things first. (interview with Kanika Greenlee, Executive Director of Keep Atlanta Beautiful Commission and Environmental Programs Director for the Department of Public Works- City of Atlanta)

Considering other materials streams such as organics materials and clothing gives the City of Atlanta the ability to minimize what is hauled from the municipality to the landfill.

The challenge of landfill space is often unknowingly alleviated by the presence of informal material collectors. Diversion is what informal waste collectors do, which spans not only metal but also into the realm of other unwanted items including pallets, cardboard, functioning electronics and appliances, wearable clothes, and untampered food to name a few. Fergutz et al. (2011) argue that informal recyclers reduce the volume of waste, and therefore, help to extend the useful life of landfills. Lane (2011) states the formal waste management cannot manage the specificities of material waste diversion alone, and that is why it is important to acknowledge the significance of the informal waste sector in policy and infrastructure.

> Imagine what it would look like if there was no metal recycling. Think about all of the consumer goods that are generated at the end of their life. What happens to them? Refrigerators, stoves, hot water heaters? … Think about cars roughly 17 million cars every year [are] all recycled as scrap metal. If the industry didn't exist, where would they go?... So in the absence of that there's nothing left, but to dispose of it--either in a landfill or by burning it. Obviously, you can't burn metal, so it ends up in the landfill. (interview with Steve Levetan, former lobbyist and Executive Vice President, Pull-A-Part, LLC)

Levetan uses a hypothetical scenario to describe a modernized city without the informal recycling sector. The waste industry is a market and the scrappers find value in more items than metals, which helps to keep valuable materials out of the landfill. As such, the relationship between informal recycling sector and the city is a beneficial, and yet, unacknowledged relationship.

4.4.3 No profit in solid waste management

Waste management is not a profit engine for many cities, and informal recyclers help to cut costs for municipalities, which is a fact that is typically unacknowledged by the municipality. Although each city has a very distinct waste process, they all acknowledge the cost of waste management as a difficulty. For example, the public works department in the City of Morrow finds the cost of managing waste and recycling infrastructure to be a challenge. In the City of Morrow, Sylvia Redic, the City Manager for the City of Morrow, says the waste management is outsourced to Advanced Disposal with some administrative costs completed by the city.

> On the residential service, we don't make money on that, whatever the company charges us is what we turn around and charge the residents, so it's not a profit engine for us. And that's another one of the challenges is getting people to understand that we're not making money off you, we're just getting you to pay the bill that we've already paid for you. (interview with Sylvia Redic, City Manager, City of Morrow)

The costs to outsource the work and the small administrative costs are combined to determine the costs to charge the residents, which Redic confirms has little return for the city.

Greenlee discussed a recent hike in waste rates for City of Atlanta residents, because of the increased cost of waste disposal. The waste disposal rates had been $445/ year for single-family household for about 10 years, and in 2019, the rates were increased to $454/ year. Greenlee states that the increase occurred following the city conducting a rate study. The rate study determined what is the true cost of waste and recycling management in the City of Atlanta versus what the residents paid and determined that the cost needed to be increased in order for the rates to cover the cost of managing waste in the city.

> We are doing another Solid Waste rate study right now [to determine] what is the true cost to the city versus what our residents pay and making sure that those are in alignment. Our Solid Waste operation is an enterprising fund meaning it should be a self-sustaining fund; what you pay in is, essentially what you pay out, but we've been operating in the red for quite some time because we didn't have a rate study. (interview with Kanika Greenlee, Executive Director of Keep Atlanta Beautiful Commission and Environmental Programs Director for the Department of Public Works- City of Atlanta)

Greenlee says moving forward, the City of Atlanta will complete rate studies more frequently to ensure the cost the residents pay for waste disposal and recycling matches the true cost of the services. Greenlee named tipping fees, fleet upkeep, and paying staff $15/ hour as the biggest financial barriers. The informal recyclers help to offset this cost by diverting materials from landfills, maintaining their own vehicles and self-employment.

4.4.4 Keeping the city clean

When discussing the benefits of having waste and recycling management, whether it be informal or formal, each of the city officials that participated in this research emphasized the cleanliness of the city.

Redic discusses how having solid waste management helps to maintain the appeal of the city.

> Whether you realize it or not, [trash] gets to a saturation point where everything looks filthy, and it just doesn't look clean. And people associate cleanliness with safety and so all of a sudden...when you get off on the exit that you're not familiar with and there's a

> bunch of trash, or maybe the light bulbs are out in the signs, you might think, "oh somebody is not keeping up with this place, nobody's paying attention that must mean it must be unsafe. I'm going to go back to the interstate and get off on an exit that looks a little better." So even from an economic development standpoint, from a population growth standpoint, litter will ultimately impact you because it creates an idea of what people think of your city. And that often is ultimately associated with crime if it doesn't look good, it must not be safe. (interview with Sylvia Redic, City Manager, City of Morrow)

Redic's comment highlights the power of trash to transform a space from appealing to unsafe; the comment also echoed Moore's (2008) assertion that the municipality must be kept clean and orderly. The 'unsafe' perception that Redic described is connected to Moore's (2008) suggestion that the proliferation of waste challenges the legitimacy of the city's authority, therefore giving passersby the idea that a certain area is unsafe because of the sight of trash.

Research on the informal recycling sector argues that because the informal material recyclers decrease the volume of waste, they help to contribute to the cleanliness of the city (Nzeadibe 2009). Cleanliness is another challenge of the city the informal recycling sector helps to maintain. Miss Liz, who does not see herself leaving the informal recycling sector soon, is optimistic that one day the municipality with notice the ways in which she and many other informal recyclers benefit the city.

> Sometime[s] we clean up the streets when they supposed to clean up the streets. The city [is] supposed to clean it up but we clean it up, free. So, no they don't appreciate us. But, we gonna still keep doing it 'til they recognize and appreciate us. (interview with Miss Liz, Informal Metal Recycler)

4.4.5 Informal waste sector supports the city

The informal recycling sector helps the city to tackle some of its biggest challenges in waste management. The largest issues named by city officials are in some way alleviated by actors in the informal recycling sector. An example of this benefit is present in the City of Atlanta, where areas without formal recycling infrastructure and lack of enforcement leads to the

informal recycling sector potentially helping to divert up to 50% of the city's recyclables from landfills. According to Greenlee, over 50% of the city's residents live in multifamily residences, which are required under ordinance to provide residents with recycling services. Greenlee admits that often times, this ordinance is not enforced.

> With multi-family residences… they don't have access to curbside programs. While the city has an ordinance on the books for multifamily dwellings at six or more to have recycling, it's not something that we've done a good job of enforcing… over 50% of the City of Atlanta residents live in a multi-family dwelling. (interview with Kanika Greenlee, Executive Director of Keep Atlanta Beautiful Commission and Environmental Programs Director for the Department of Public Works- City of Atlanta)

The lack of enforcement potentially leaves more than 50 percent of recyclable materials in the City of Atlanta from being recycled. The lack of service for a portion of the residents is a result of what some scholars define as "splintered urbanism" (Marvin and Graham 2002: 1), where due to the privatization of public services a portion of individuals receive good services while a lower class receives little or no service. This is a divide typically of race and class, and considering that the city only provides services to single-family homes, which is a signifier of class, then the other 50% of residents who live in multifamily units are not provided with adequate recycling services; therefore, the informal recycling sector has a significant role in recovering materials from those locations. A portion of the metal from the neglected 50% of residents is likely recovered and recycled by informal material collectors, therefore contributing to the landfill reduction rates that the city needs. Unfortunately, these values are not calculated by the City of Atlanta. Lane (2011) discusses a similar lack of acknowledgement in Melbourne where the municipality completed a materials study and did not consider quantifying the amount of materials the informal waste collectors diverted from landfills.

Redic, who manages the solid waste contracts and litter programming for the City of Morrow, admits that she never considered the informal recycling sector prior to this study.

> Again it's just like, is there an informal waste sector? When you say that I'm like, gosh, it almost implies that there's this whole world of informal waste, and I just had no idea it even existed... And I was like you're just opening my eyes to something I didn't even realize was a real thing, and so I appreciate that. (interview with Sylvia Redic, City Manager, City of Morrow)

Redic's comment is true for many smaller incorporated cities that outsource their waste infrastructure to large waste management companies.

4.5 Power dynamics of waste in metropolitan Atlanta

The contention between the informal collectors, city authorities, and materials that have been rendered invaluable by their owners exposes power dynamics within the waste disposal scheme. The power dynamics are succinctly described in Wacquant's interpretation of macro models of penalization as "a punitive revamping of public policy that weds the "invisible hand" of the market to the "iron fist" of the penal state" (Wacquant 2017: 86). In this case study, the "invisible hand" is the informal metal recyclers who are the life force, while the authorities are the iron fist. Despite their contributions, ill-informed recyclers are at risk for penalization, because the metal that many of them pick up on the curb is the property of the authority. Notwithstanding, that the items collected by the recyclers are discards on the curb and that the discards are destined for a landfill, the items are property of the city and therefore are risky items for the informal metal recyclers, who could be jailed for theft. In this case, authorities place significance and ownership into materials discarded by their residents as a way to delegitimize informal recyclers. The power dynamic is what Lane (2011: 395) defines as a "resource recovery waste regime", which emergences out of neo-liberal government approaches that put an

emphasis on individual responsibility while enhancing markets to promote public environmental benefits. The transition of waste from hazardous to resource justifies the government facilitation of waste management. Who has the rights to waste is often a space for contention between the municipality and the informal recycling sector. Lane (2011) stated in research she completed in Melbourne, Australia, a minority World Country, that municipalities create contracts with waste haulers, and when informal waste collectors beat the haulers to collection sites, the informal waste collectors, take away money the hauler is expected to make. Formal entities in essence describe the haulers' approach to waste collection as theft, because the unwanted discards are intended for the hauler. Contractually, the waste belongs to the hauler the moment is it placed on the curb, or what Lane (2011: 398) defines as the "nature strip," which means the informal metal recyclers are taking materials illegally. As opposed to the unwanted materials belonging to the city or the contract waste management company, Lane (2011) suggests that the unwanted goods could be viewed as 'informal waste commons' rather than property of an authority, where the unwanted goods are placed on the curb and the curb becomes a gathering space for informal activities of collectors, passersby, poor college students, and neighbors alike, to scan discards for potentially useful items.

With our process of 'relocation and dematerialization', which defines the transition of an item from desirable, needed and useful to unwanted and useless (Davies 2012), it seems commonsensical to believe that anything unwanted by the owner is available for taking, particularly when it is displayed in an unwanted state such as on the curb by the trash can; however unaware to many, what is placed on the curb officially belongs to the city or hauling company depending on the contract defined between the city and the hauler. Informal waste collectors are unaware of the contract that cities have with waste disposal companies. In the view

of the collectors their collection of dispose materials is harmless. Informal recyclers do not believe they are participating in criminal activity, particularly because the informal recyclers identify informal recycling as an alternative activity to crime. The informal recyclers have to check with the household before taking an item if they are unsure if the item is an unwanted item.

> Sometimes you think you need to go and question 'fore you get it, especially when they look too good to be true because some stuff look like its new, if it look like its new and ain't beat up, I'mma ask for I do it because they might have just set it out there so they can be able to move it around. (interview with William, Informal Metal Recycler)

Contrary to what the waste collector perceives as legal material collection, Levetan, a former lobbyist for the recycling industry nationwide, names informal recyclers taking materials from the curb as a theft problem within the industry.

> Once they put it at the curb that material belongs to the local government or their designee. So somebody coming along, you know ahead of the truck and pulling out the aluminum cans could and should be considered frankly criminal activity. (interview with Steve Levetan, former lobbyist and Executive Vice President, Pull-A-Part, LLC)

Levetan says that although the municipality cannot tell the resident what to do with their unwanted materials, once the resident places the unwanted materials in the bin, they no longer have rights to the waste because it belongs to the municipality or hauler. Antonio Valenzuela, the Director of Public Works for the City of South Fulton, mirrors Levetan's emphasis on the illegitimacy of informal recyclers pointing out that their taking of curbside materials is a breach of contract, between the city and the designated hauler.

> I think it is a legal question which I cannot authorize anything outside the ordinance. You cannot solicit work, there's an ordinance on panhandling, I believe, which is, that would fall under that ordinance... you have to have certain guidelines to allow people walking into the streets and into households and so on. (interview with Antonio Velenzuela, Director of Public Works, City of South Fulton)

Valenzuela groups the informal metal recyclers with panhandlers and solicitors, and suggests that the work of the informal metal recycling sector is a conversation of legality. The criminalization of informal metal recyclers is a nod to neo-liberal politics and the hyper-policing that occurs within the city. Wacquant has described this as the carceral state, which is a neo-liberal design to discipline the working class, and Foucault (1977) defines it as a "carceral archipelago", where technologies within modern cities allows for consistent social control. The control is hyper to the extent that even waste, unwanted, useless, items can compromise a person's legitimacy.

Redic, who is open to the idea of looking into ways that the municipality could be more inclusive of informal waste collectors, acknowledges that supporting informal materials collection would require the City of Morrow to adjust its contract with Advanced Disposal.

> Conceptually I could definitely see a value. But again we're under contract with a company, so we would have to even amend the contract because they're supposed to get all of the stuff, and they get to cash in whether it's the metal that they recycle or whatever. And so we would have to make sure that allowing some kind of informal structure isn't putting us in breach of a contract we already have. So if we were going to do it, we'd have to do it at the end of the contract and make sure that the new contract considers an informal system. (interview with Sylvia Redic, City Manager, City of Morrow)

One collector, Willie, mentioned a time when he was told by the police that he should not be picking up the materials at the curbside. Willie was admittedly confused when learning that he could not pick up the materials, stating that he was doing the city a service by picking up the materials before the city.

> I don't think they really appreciate us 'cause we have pulled up to some spots and it [would] be stuff on the side of the street. We start getting the metal up the police will come up and tell us we can't get it. Why? Why we can't get it they throwing it away. "The city supposed to come get." But I'm getting it before the city get it so I'm helping the city clean this sidewalk off. Sometime they won't let you get it. They'll tell you you trespassin'. This a public sidewalk so how am I trespassing. I'm a part of the public. It

> just depends on where you at and when you there and what officer or what person is there and pulls up on you. (interview with Willie, Informal Metal Recycler)

Willie's assertion that his work is helping to keep the city clean, and also his reference to the areas he is cleaning up as a public space, opens up discussion about the rights to waste and how it is connected to rights to the city. In Wille's example, his willingness to clean up the city exposes his belief that he has some ownership in the city. Roy (2005) discusses the connection between the informal and the right to the city stating that working in the informal sector brings up policy responses to the informal participants' claims and appropriations that do not fit neatly into the ownership model of property that the formalized sector has designed. Willie was the only informal metal recycler that had an issue with the police, which was a verbal warning. Other recyclers say that the police do not bother them, and they also question why the police would have an issue with what they are doing.

In the case of the informal waste workers, recycling metal appears to be their alternative to a life of crime; having admitted that in the past, they made bad decisions. Most of the informal metal recyclers have not experienced run-ins with the law. William Ward, who has worked in the metal scrapping business for about 15 years, said that he has had no run-ins with police since he started. He even emphasized that he picks the materials up off the street, making it a legal action.

> I pick it up off the street, it's legal. 'Till I found out something different; that's something different… if you break the law that's what they made [the law] for, but long as you're abiding by the law you ain't got no problem. (interview with William, Informal Metal Recycler)

William also discourages other informal metal recyclers from stealing. "I wouldn't advise nobody to do nothing illegal to try to make a dollar out of it," William says. Another informal metal recycler, KW, mentioned that he had never had an issue with the police, and he also

believes that the police honors his approach to livelihood. KW also questioned what the authorities' issue would be if they did catch him pulling metal from trash cans.

> They pretty much see me in a dumpster and stuff and I think that they respect the game. I could be doing a whole lotta other stuff, than in a dumpster. What they gonna say, "hey get out of that dumpster?"... They will see me and ride on pass. Unless somebody call and I ain't never had that to happen. You got some of [people] ask "what [are you] doing in there?" "I'm getting trash; it's a dumpster," but ain't never had a police to approach me. (interview with KW, Informal Metal Recycler)

KW's response "I'm getting trash, it's a dumpster" lends thought to how the concepts of 'dumpster', 'trash', and 'waste' are perceived. His response stating that he is in a dumpster is a way to remind the inquirer that the dumpster is place of unwanted items, and that there is something more important that they could be doing instead of being concerned that he is inside the dumpster. This is a part of the dematerialization process that scholars describe as a critical transition of goods (Davies 2012; Gregson and Crang 2015)

> I've been in trouble before. The police don't bother me that much cause they already know me, I went to school with them, and I've been in and out of [jail] all my life. I went to school with all them folks and they know that. Nah, I don't have no trouble with the police, I used to though…. they know I've been in trouble once and I'm out of it, and they bring up old stuff… I'm through with it. (interview with Samuel, Informal Metal Recycler)

Samuel, a metal recycler that had been recycling materials since he was a young boy stated that he is very familiar with the police, because of his troubling past and his acquaintance with some of them in high school.

4.5.1 Little expectation for city support

When asked to consider ways that the city could support their work, many of the collectors made tongue in cheek responses, that alluded to what little expectations the collectors have for how the city could support their work. Some of the suggestions included, the city could

bring them items from the junkyard so they could sell, or the city could pay the informal metal recyclers $19 plus benefits. This is contrary to the Majority World where informal material collectors are clear on what their needs are from the city. In informal waste research completed in Aba, Nigeria, Nwosu et al. (2016) state that operators in the informal waste management are 'acutely aware' of their needs from the government, mostly requesting recognition and acknowledgement for their presence within policy. This is likely because in Aba, the municipality intentionally impedes on the work of the informal waste sector, which is something the informal material collectors in Georgia are not challenged with because policies are in place that support the recycling industry including, to an extent, the informal material recyclers.

The knee jerk responses from the collectors about ways that the city could improve their work also reveals how they view their own work understanding that it is precarious and uncertain. The collectors seem to prefer to work independently of the authority, because of its benefit (no taxes on what is sold, less paper trail, and freedom). Because of their preference to work independently, many of them have not considered how the city could support them. It is possible that the city cannot truly help them because if the city did support, the city would take away from their freedom to complete tax-free work, and the informal metal recyclers prefer informality. This celebration of self-made obscures the role of the state and even renders it unnecessary. Roy (2005) describe the 'self-made' mentality as a threat because it furthers the neoliberal agenda to privatize services. However, considering the relationship between the informal recyclers and the authority, it is unrealistic for the recyclers to expect public services from an entity that has penalized, criminalized, and shut them out of resources.

4.5.2 City as competition

The informal waste collectors see the city's department of public works as competition, because the materials that they typically seek out are sometimes collected by city workers. One recycler gave a story of seeing a dryer on the street while dropping off a load of metals. He stated that by the time he returned, a City of Atlanta truck had already picked up the items.

> There was another dryer on the street and I was having trouble getting back, you know taking too long to get back, and the City came and got it and I drove up and asked him. "Did you just get a dryer," and he's like, "yeah." And you know they have the big arm on the back of the truck they used to pick up and so the city is cutting into it now. So that makes it harder. So that's why I'm really at the end of my road really with it. (interview with Reginald, Informal Metal Recycler)

Reginald talks about municipalities having technology that allows for the city to easily cut into the informal recycling industry's business. The municipality is a well-resourced entity, and with the proper tools and staff can outcompete informal metal recyclers.

The city officials for this research had little to offer around the relationship between informal metal recyclers and the municipality, mostly because the city officials admitted to not being knowledgeable of the informal recycling sector; however, Redic asserted that there was a need to improve the waste management infrastructure so that more discarded materials could be repurposed and recycled.

> I'm not saying that any one piece is more important than the other, but they all tap into the equation about how as a nation we need to have a more assertive approach to waste management. And I don't mean like big waste companies coming in and taking it all to the landfill, I'm talking about the thing you're researching. The innovative ways to repurpose and recycle material. (interview with Sylvia Redic, City Manager, City of Morrow)

As material banks and circular economies increase in interest and implementation, municipalities with have to adopt structures similar to the informal recycling sector in order to divert materials from landfills appropriately. The informal sector participants will serve as experts on how to

manage materials through banking systems and circular economies. The informal sector has a long stretch of these practices and share common approaches across various borders and industries.

5 CONCLUSIONS

The informal waste sector is a dynamic industry that is largely unseen (McFarlane and Silver 2017) and yet, it is identified by many scholars as a critical function to the production of the urban (Fergutz et al. 2011; Mitlin 2011; McFarlane and Silver 2017; Nzeadibe 2009; Nzeadibe and Anyadike 2012; Nzeadibe & Mbah 2015; Thieme 2010). This research gathers insight about the informal waste sector in the Minority World through interviews with informal waste workers, city officials, and material buyers in an effort to evaluate the significance of the informal waste sector in a Minority World country based on a case study completed in metropolitan Atlanta. This research covers unexplored areas in the informal waste sector body of research, because most of the existing research has been written exclusively on the Majority World.

Through this research we understand the viability of informal waste work in metropolitan Atlanta and identify the degree to which the region's municipal governments acknowledge—and are inclusive of—the informal waste sector. Through an analysis of the interviews completed for this research, I found that the informal waste workers in metropolitan Atlanta work in precarious conditions. The sources of the metals that waste workers depend on are based on each individual recycler's own knowledge and capacity, and despite the recyclers developing tactics to yield large sources of metal scraps, the certainty of scoring valuable metal is sometimes unknown. The informal recyclers also have doubtful relationships with the formal waste sector including recycling centers and municipalities. At recycling centers, where the recyclers drop off their scrap metal, the rates fluctuate and the recyclers often remain skeptical that the recycling centers provide fair prices. The informal recyclers' unpredictable working conditions make informal workers in metropolitan Atlanta less inclined to organize cooperatives and demands from

governments like their counterparts in Majority World countries. In my findings, the informal recyclers in metropolitan Atlanta have little expectations of the municipalities that they work within, and the municipalities have little to no acknowledgement of the informal waste workers that navigate through their cities. The minimal relationship between the informal metal recyclers and the surrounding municipalities disadvantages the informal waste workers who help to keep cities clean, save the municipality money, and divert waste from landfills; and receive little acknowledgement or favorable conditions from the municipality. Formal actors in the recycling sector aid in the production of informal work's attachment to criminality by citing the criminal aspects of informal waste recycling as a deterring factor, and by asserting their power over collectors by enforcing the contractual rights to waste placed on the curbside.

Despite the precarity of work and the lack of support from municipalities, the informal recyclers in metropolitan Atlanta are committed to recycling scrap metal as a source of income. The recyclers also claim rights to the city and perceive their work as valuable to the appeal of metropolitan Atlanta. The recyclers interviewed for this research cited freedom, flexibility, family, pride, and conviction towards hard work as reasons for continuing to collect scrap metal. The informal metal recyclers in metropolitan Atlanta also aid in a wide network of people that benefit from discarded materials, and can be described as the 'invisible hand' that satisfies the 'iron fist' of the scrap metal industry.

The condition of informal recyclers in metropolitan Atlanta is like that of informal waste pickers in Majority World countries. Informal recycling sectors are heterogeneous infrastructure configurations (HIC) (Lawhon et al. 2018a) that exist in both Majority World and Minority World countries. The HICs have been developed from unique circumstances and include a socio-technological mechanism that relies on consumer waste and industry rates to operate. In

metropolitan Atlanta, these natural structures are created from discarded goods with potential value that recyclers will pick up to sell to a scrap yard or pawn shop, or to give to someone in need. Informal recyclers in both the Minority World and Majority World seem to deal with a lack of acknowledgement from the jurisdictions that they work within. In Minority World countries, the lack of acknowledgement appears to be rooted in divergent understanding from city officials that the informal industry even exists. In metropolitan Atlanta, the ignorance of the city officials is exposed when the informal recycling sector has not been included in waste studies completed in the city, which misses a significant quantity of recycled materials. The lack of acknowledgment is also made apparent in the rights to waste discussion, which is interpreted differently between the informal metal recyclers and municipalities. In Majority World countries, this neglect is sometimes more intentional, where policy is explicit in illegitimating waste workers. In other cases in the Majority World, waste workers are not clearly defined in policy; as such, they are often linked with sanitation workers. The grouping of recycling and waste industries creates unfair requirements, because sanitation is more hazardous and threatening in comparison to recycling, and therefore, the distinction is necessary so informal collectors are not expected to adhere to strict policies that the sanitation workers must adhere to. In metropolitan Atlanta via Georgia state statutes, the distinction of types of material management helps to make it easier to open a recycling center in comparison to a landfill, which is notorious for health, environmental and social risks. The statutes set by the state of Georgia also protect material recycling businesses, and its constituents such as informal metal recyclers, from flow control.

Despite Georgia's clear distinction of the recycling industry versus the solid waste industry, because the industry is earmarked for private investment, the welfare of informal workers remains unclear. In Majority World countries, informal recyclers have developed

cooperatives, which have assisted in giving the groups more visibility and soliciting the government for requests. In metropolitan Atlanta, to date there has been no consideration from the informal metal recyclers interviewed that suggest they have considered self-organizing for demands from the municipality. One reason for this lack of organizing could be linked to the informal recyclers in the Minority World having more primary work, and the metal scrapping only being supplemental. This is different from informal recyclers in Majority World countries, where they depend solely on waste picking for livelihood. Nwosu et al. (2017) describe both wasting picking as the primary source of income and the absence of cooperative organizing among waste pickers, as indicators of high vulnerability.

5.1 Future research directions

Considering the nuanced distinction of how waste is managed from city to city, future research should compare the waste management processes for numerous municipalities in a single region. This will give a comprehensive look at the various ways municipalities chose to manage their waste and why.

There is also an opportunity to explore the lack of acknowledgement of the informal recycling center by city officials in metropolitan Atlanta by examining archival records to understand the relationship between the region and the informal sector better. Also, this research could offer a better understanding of the significance of the informal recycling sector on the workers who fuel the sector—and the city. There is an opportunity to explore the informal metal recyclers' individual needs in depth. Conducting a quality of life analysis would offer more robust information about the vulnerability of the informal recycler community. Lastly, this research focused on the informal metal recyclers' relationship to the municipality; however, it could be argued that there is more to explore outside of the incorporated lines of many cities.

Informal waste workers may find less resistance in areas that are not incorporated, even though these spaces may also lack the consistent material source that can be found within the urbanized area.

5.2 Recommendations

Many municipalities lack vision on the future of municipal waste management. Scholars urge that the status quo in the industry will not last long, because informal models of material management are becoming the necessary infrastructure for recovering materials (Lane 2011). Considering that large cities exceed their own landfill capacity, municipalities will need to adopt a system similar to how the informal sector already performs. The need to adopt alternative waste management models, where the materials are sorted and hauled to materials recovery centers in lieu of landfills, is due to the prevalence of waste that has little or no opportunity for recycling or revaluing. There is an opportunity to explore the decision-making process for product design, and how product design impacts municipalities' waste management systems.

Lastly, much like the sanitation strikers in the 1960s and 1970s, who demanded better pay and decent working conditions, informal waste collectors in metropolitan Atlanta have an opportunity to improve their own welfare by organizing in cooperatives for more visibility and collective bargaining in terms of how municipalities can improve their work—and ultimately their cities.

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- APPENDICES: INTERVIEW QUESTIONS

1. ***Appendix A- Informal Waste Collectors***

    a. How would you describe your work?

    b. How many years have you done this work?

    c. Who are the actors in the informal waste sector?

    d. What types of people are typically working within the informal waste sector?

    e. What materials do you collect and why?

    f. What brought you to the informal waste collection work?

    g. Do you make a livelihood collecting materials? About what percentage of your livelihood is provided by informal waste collection? Do you have additional work?

    h. Do you notice change in waste volume over time or space?

    i. Where do you usually pick up your materials? Where do you drop them off? Can you talk through a route with me?

    j. What are the challenges and benefits to your work?

    k. How do you feel about your work as a materials collector?

    l. Do you see an increase in waste/ pollution?

    m. What motivates you to do this work?

    n. What challenges do you experience? How could your work be improved?

    o. Do you work directly with the formal waste management? In what ways?

    p. have you seen an increase of waste over time? We want to know where are the sources of waste

2. ***Appendix B- City Officials***

a. What is your role vis-à-vis waste management?
b. How long have you been in this position?
c. What is your unit's responsibilities in waste management? [prompt for size, materials, annual waste disposal tonnage for residential landfill collection, for recycling collection]
d. How many employees work in this unit? What are the different kinds of jobs?
e. What, in your view, are the benefits of [your city's] waste infrastructure?
f. What, in your view, are the challenges of [your city's] waste infrastructure?
g. To what degree are you aware of the informal waste sector?
h. On a scale of 1-5, one being not important and five being very important, how would you scale the informal waste sector's contributions to waste management in the city? Why?
i. Can you estimate in volume how much waste is managed by the informal waste sector?
j. Are there city policies specific to the informal waste sector?
k. Are there any challenges the city may experience with the informal sector?
l. How is the informal waste sector acknowledged in municipal policies?
m. How closely, if at all, do you coordinate with or anticipate informal waste collection?
n. What shifts, if any, have you witnessed in waste generation during your time working with [x organization]?
o. To what degree is your department prepared to manage an increase in waste generation? In what ways?

3. ***Appendix C- Recycling Companies***

    a. What is your role vis-à-vis recycling?

    b. How long have you been in this position?

    c. How long has this recycling center been in business?

    d. What materials do you recycle? What is the volume of these materials?

    e. What is the approximate annual/monthly value of the materials you recycle? What is the most common source of waste that comes to your site?

    f. How many employees work in this unit? What are the different kinds of jobs?

    g. Do you consider your company's work part of the informal waste sector? If so, how? If not, why not?

    h. On a scale of 1-5, one being not important and five being very important, how would you evaluate your company's contributions to waste management in the city? Why?

    i. What, in your view, are the challenges that your company faces?

    j. To what degree do you work with the formal waste management sector? In what ways?

    k. What shifts, if any, have you witnessed in waste generation and recycling during your time working with your organization?

    l. To what degree is your department prepared to manage an increase in waste generation? In what ways?

    m. [If not covered] Do you or your company regularly work with informal recycling collectors? If so, how would you characterize your relationship?

4. ***Appendix D- Waste Experts***

a. What is your role vis-à-vis waste management?
b. How long have you been in this position?
c. What, in your view, are the benefits of waste infrastructure?
d. What, in your view, are the challenges of waste infrastructure?
e. To what degree are you aware of the informal waste sector?
f. On a scale of 1-5, one being not important and five being very important, how would you scale the informal waste sector's contributions to waste management in the city? Why?
g. What shifts, if any, have you witnessed in waste generation and recycling during your time working with your organization?
h. What, in your view, are ways to improve waste infrastructure both formally and informally?
i. [If not covered] Do you or your company regularly work with informal recycling collectors? If so, how would you characterize your relationship?