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MINING OUR HOPES AND DREAMS: LARGE-SCALE MINES AND YOUTH

OUTCOMES IN PERU

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Abstract

Large-scale mineral extraction in Latin America has been widely scrutinized for associated social, environmental, and economic impacts on communities, regions, and countries. Limited empirical attention has focused on the implications of such impacts for youth. In recent decades, Peru has adopted a national strategy that promotes transnational investment in mining developments in gold, copper and silver, leading the country to be the second-largest copper exporter in the world. However, mining projects have deep and lasting social and environmental impacts, particularly in rural areas. Mines may offer new labor-market opportunities in rural areas while simultaneously undermining the natural environment on which livelihoods depend. A youthful country demographically, this economic strategy has implications for Peru's adolescents and young adults, shaping their opportunities, decision-making and life trajectories during key periods of transition to adulthood. Using an explanatory sequential mixed-methods design, this project draws from primary and secondary sources of data, including census data, independently collected survey data and semi-structured interviews. Situating youth experiences within the context of an extraction-based economy, this research builds on existing literature to contribute nuanced understanding of youth experiences across axes of geography, exposure to mines, and gender. Using a difference-in-differences design, I find large-scale mine projects do not significantly improve the percent of youth employed or obtaining higher education at the provincial level. This finding counters the developmental narrative that touts economic growth, job opportunities in impacted areas. Further, by way of individual-level analysis I find youth residing in provinces with large-scale mining developments have better odds of attaining higher education, but lower odds of employment compared to those in non-mining areas. Such

educational benefit and employment disadvantage is found to be unequal across axes of gender and rurality. Rural youth experience significantly better odds of employment compared to their urban peers and compared to youth from non-mining areas, but have lower odds of obtaining higher education compared to their urban peers. On the other hand, areas with long histories of mining minimize gender inequalities in higher educational attainment, but exacerbate gendered employment opportunities. Finally, qualitative results reveal that youth perceive broad economic benefit from mines, despite limited direct experiences of such benefits.

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Dedications

This dissertation is dedicated to my families. First, my endlessly patient, supportive and loving partner Alfonso Reyes Vasquez, who never wavered in his support of my higher educational endeavors. My children, Jackson and Micaela, who grounded me, made my life whole, and offered distractions from the daily trials and tribulations of graduate studies. To my parents, who fed me and my family and housed us on countless occasions. I could always count on for them for company when the rest of the world was closed off because of the global pandemic. To my siblings and siblings-in-law, who offered humor, wit, and companionship. To my in-laws, who loved me and my family from afar and were always willing to help me try out ideas and practice my Spanish. And to my Peace Corps host family, the Alvarado Mayanga's, who housed me, cared for me, and made me fall in love with Peru. What I have learned and continue to learn from them is both immeasurable and inspirational.

Chapter 1 – Introduction and background

Introduction

The purpose of this research project stems from the simple question of whether large-scale mining is good or bad – an important but entirely unanswerable question without additional parameters. Good or bad for whom or for what? At what scale? Are metrics of "good" or "bad" in reference to social, environmental, or economic outcomes? In fact, research abounds on the impacts of large-scale mining development, responding to such qualifying questions, stemming at their core from the empirically ambiguous and value-laden root question of "good" or "bad" (Bainton & Banks, 2018; McMahon & Remy, 2001; Santos, 2018; Zabsonré, Agbo, & Somé, 2018). Evidence has been mixed for both economic and social implications of large-scale mining, varying greatly by time and place (Aragón & Rud, 2013; Gajate-Garrido, 2014). Even the seemingly unambiguous environmental impacts are difficult to disentangle when considered in concurrence with societal and economic well-being outcomes (Sosa & Zwarteveen, 2012). It is within this mixed empirical landscape that this project seeks to further understand the implications for youth transitioning to adulthood in mining communities. In other words, are large-scale mining developments "good" or "bad" for young people?

The research presented here draws together disciplinary approaches from Rural Sociology, Demography and International Agriculture and Development to assess rural youth outmigration known as the "brain drain" (Sherman & Sage, 2011), the gendered impacts of mining projects (Eftimie, Heller, & Strongman, 2009; Park, Metzger, & Foreman, 2019; Oxfam, 2017), and the demographic changes that accompany large-scale developments such as mines (Bainton & Banks, 2018; Castillo & Brereton, 2018a; Godoy, 1985; Moran, 2016) in the Peruvian context. While a large body of literature addresses youth well-being (Crivello,

Camfield & Woodhead, 2009; Gauthier, 2007; Park, 2004; OECD, 2017), youth demographics (Grant & Furstenberg Jr., 2007; Rindfuss 1991), and the impacts of large-scale mines (Aragón & Rud, 2013; Bebington, Humphreys Bebbington, et al., 2008; Davis & Vásquez Cordano, 2013; Gamu, Le Billon, & Spiegel, 2015), little work was focused explicitly on assessing the role of large-scale mining on youth social and demographic outcomes in the Global South (Maconachie, 2014; Wilson, 2012). This project fills this gap, assessing the impacts of large-scale mining within a framework of dependency and political economy and focusing on individual-level youth outcomes through the lens of capabilities (Bunker, 1984; Cardoso & Faletto, 1979; McMichael, 2017; Ross, 1999; Sen, 1999). The Peruvian context offers a unique setting to assess such impacts on youth given both the proliferation of large-scale mining projects since the 1990s and the largely youthful population (Bebbington, Humphreys Bebbington, et al., 2008; Hudson, 1993; INEI, 2020; Sullivan, 2014).

In this chapter, I will provide background for this research project, describing the interconnections between large-scale mining projects in Peru and youth well-being, offering a road map for the rest of this dissertation. I will then describe the key orienting research questions and organizational structure for this project.

Background

Research abounds evaluating the benefits and consequences of mining projects (Bainton & Banks, 2018; McMahon & Remy, 2001; Santos, 2018; Tallichet, 2014; Zabsonré et al., 2018). Evidence has been mixed for the economic and social implications of large-scale mining, with impacts varying greatly by the time, scale, methodological tools and study context (Aragón & Rud, 2013; Gajate-Garrido, 2014). However, emerging evidence suggests living in extraction-

based communities may have profound implications for young people's human capital accumulation and long-term socioeconomic outcomes (Segerstedt & Abrahamsson, 2019). Such implications are compounded by ethnicity, gender, and residence in rural areas (Crivello, 2015; Pasquier-Doumer & Risso Brandon, 2015). It is within this mixed empirical landscape that this project seeks to further understand the implications for youth transitioning to adulthood in mining communities. Additionally, most large-scale mining projects are located in rural areas and may disproportionately impact rural youth outcomes. In other words, I ask: what are the impacts of mining developments for young people in rural and urban areas transitioning to adulthood? The following proposal will situate youth within a broader political economic landscape of large-scale mining development in Peru, demonstrating the ways in which key youth transitions in mining regions vary from those in non-mining areas, particularly with regard to decision-making, future aspirations, and educational, economic, migration and family formation outcomes.

Political economic approaches to large-scale mining embed individual outcomes within larger systems of governance, economic systems, land-use changes and development agendas. Such approaches provide a framework for contextualizing the dramatic changes in rural communities across Latin America over the past four decades (Guzman, Singh, Rodriguez, & Pantelides, 1996). Historically, the economies of many Latin American countries have been based on the extraction and export of natural resources. The scale of mining extraction and agricultural production proliferated after the 1980s, corresponding with structural adjustment programs and rising global commodity prices (Bebbington, Abramovay, & Chiriboga, 2008a; Laurell, 2000; North & Grinspun, 2016). In this time period, socioeconomic policies in Latin American countries took divergent paths – some adopting neoliberal, pro-business policies, and

others adopting more protectionist policies (Jacob & Pedersen, 2018). Countries such as Bolivia, Venezuela and Ecuador adopted protectionist policies that reinvested proceeds from extractive industries into social programming, while other nations such as Peru adopted increasingly neoliberal policies, inviting private investment in the mining and agricultural sectors, generously granting mining exploration and exploitation contracts (Sosa & Zwarteveen, 2012; Ticci & Escobal, 2014). In fact, Peru's mining exports increased dramatically in the 1990s and early 2000s, corresponding with strong and consistent economic growth (Bury, 2005). However, inequality persists despite such economic growth, leaving rural communities disproportionately impoverished and lacking basic services and infrastructure (World Bank, 2010; Thorp & Paredes, 2010).

It is within this context of simultaneous national economic growth and growing inequality that rural communities contend with shifting social, political and environmental landscapes in the face of large-scale mining development. Such projects have deep and lasting social and environmental impacts in rural areas. Mines may offer new labor-market opportunities in rural areas while simultaneously undermining the natural environment on which livelihoods depend (Damonte & Vila, 2014; Riggirozzi, 2012). In Peru, the proliferation of large-scale mining projects has been met at times with social conflict and fierce opposition, leading to community tensions and insecurity about the future of these development projects (Damonte & Vila, 2014; Bebbington & Humphreys Bebbington et al., 2008). In the face of social, environmental and economic change associated with mining, young people in Peru face decisions related to family planning, family initiation, educational outcomes, and migration (Hinojosa, 2013). The outcomes of youth decisions at key life transitions in mining areas – and whether or not youth aspirations are influenced by such projects – are not well understood. It is

within the context of rising national investment in large-scale mining and shifting social, environmental and economic landscapes that this research project seeks to center the experiences, aspirations, social and demographic outcomes of youth in Peru.

Research objectives

This project seeks to evaluate the impact of large-scale mining projects for youth outcomes in Peru. To this end, this research is guided by the following research questions:

Research Question(s) 1: Has the proliferation of large-scale mining in Peru since the 1990s been associated with improved educational and employment outcomes for youth? Do demographic outcomes for youth in mining provinces differ from provinces unaffected by mines?

Research Question(s) 2: Do educational, employment and demographic outcomes in mining- and non-mining provinces vary across axes of gender and rurality? How so?

Research Question(s) 3: Do lived experiences and aspirations of youth vary by whether or not they grew up around large-scale mines?
    a) How do youth describe their lived experiences and aspirations for the future?
    b) In what ways do the lived experiences and aspirations of youth vary by gender and rurality?
    c) What factors do youth identify that constrain or enable them to reach their aspirations?
    d) What perceptions and opinions about large-scale mining do youth in Peru hold?

Dissertation Organization

This dissertation is organized into seven parts, described below:

The second chapter, titled "*Theoretical Foundations*" describes the theoretical lens through which this analysis is conducted. I describe foundational theories of dependency, the resource curse, political economy and capabilities to orient this analysis, applying a cross-cutting gender lens throughout.

Chapter 3 "*Review of Relevant Literature*" situates this research into the body of work exploring the social, economic, demographic and gendered impacts of large-scale mining. Additionally, this chapter provides details of the Peruvian context, articulating how it serves as the ideal setting for exploring the relationship between large-scale mines and youth outcomes.

Chapter 4 "*Methodology*" describes the methodological approaches for this study. Specifically, the details of data acquisition, collection and analysis are described. In addition, I detail the multiple analytical approaches employed to respond to the guiding research questions: difference-in-differences models, exploratory spatial analysis, logistic and multinomial regression, and qualitative coding and analysis.

Chapters 5 - 7 present results of three separate analysis. First, in Chapter 5 "*Mine proliferation and youth outcomes across time and space*" I present the results of difference-in-differences models and exploratory spatial analysis using aggregate youth outcomes. Chapter 6 "*What are the odds? Youth well-being in mining areas*" uses logistic and multinomial regression models to understand individual youth outcomes in mining areas. Finally, Chapter 7 "*Contemporary youth experiences of well-being decades after Peru's mining boom*" presents the results of primary data analysis drawn from survey data and in-depth interviews.

As implied, Chapter 8 "*Conclusion*" concludes this dissertation by drawing together findings from the three previous chapters, linking key findings within the applied theoretical frameworks and existing literature.

Chapter 2 – Theoretical foundations

A substantial body of work has evaluated the social, economic, environmental and gendered impacts of mining on multiple scales (Aragón & Rud, 2013; The World Bank, 2001; Werner, Bebbington, & Gregory, 2019; Zabsonré, Agbo, & Somé, 2018). This literature emerging from sociology, geography and economics has employed the orienting constructs of dependency and political economy to root the experiences of extraction-based economies within histories and geographies of unequal exchange (Bunker, 1984a; Cardoso & Faletto, 1979; Ross, 1999; Wallerstein, 1988). However, such frameworks often overlook individual-level agency and community-level impacts (Burroway, 2017). Therefore, on local- and individual-levels, Sen's (1999) human capabilities framework is useful for assessing youth well-being within the contextual reality of large-scale mining. In this chapter, I first describe three macro-orienting frameworks – dependency, political economy and the resource curse – and their roots in sociological research around mining in order to contextualize findings from this project. Then, I describe Amartya Sen's (1997, 1999) capabilities framework as a lens through which to understand the lived experiences of youth in the context of large-scale mining development in Peru. I explain how a critical gender lens of Sen's (1987) multiple identities frames my theoretical approach to examining the impacts of large-scale mining projects on youth. Finally, I describe how youth are defined and understood in this project, concluding with a summary of the integrated theoretical framework applied throughout this study.

Dependency

McMichael (2017) succinctly defined dependency as "unequal economic relations between metropolitan societies and non-European peripheries" (p. 6). The author explained that dependency theory emerged in reaction to dominant developmental paradigms of progression

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toward the European model – perceived as the developmental apex. For example, early works by Rostow (1959) conceptualized "development" as transitioning in a linear fashion from a traditional, primarily agricultural society toward an increasingly consumptive and metropolitan society. In contrast, dependency theorists contend that development is an inherently unequal process in which some countries (the global North) benefit from unequal exchange of goods from other countries (the global South), rooted in historical legacies of colonialism (Wallerstein, 1974; Cardoso & Faletto, 1979). Indeed, the very concepts of development and underdevelopment are seen as hegemonic tools through which to maintain an unequal capitalist world system, ignoring countries' unique economic and social histories (Cardoso & Faletto, 1979; Frank, 1969).

Wallerstein (1974) articulated such unequal relationships within the broader world system in which modern-day capitalism embodies the overarching rules of the game. Wallerstein drew from concepts put forward by Frank (1969) in which development is often ahistorical and built on unequal relations of power. In addition, Wallerstein drew from concepts from the "Communist Manifesto" (Marx and Engels, 1928), in which industrialized societies are built on unequal class relationships. Wallerstein extended the concepts of Marx and Engels – in which the bourgeoisie own the means of production while the proletariat's labor is perpetually exploited – to the entire globe, proposing the existence of a capitalist world system consisting of "structural positions" (1974, p. 401) of the core, periphery and semi-periphery. Within this world system, the core nations have consolidated power and economic advantage through historical processes of exploitation (of labor and materials) at the expense of peripheral nations. Core nations rely on the goods provided by the periphery and semi-periphery, and hence act in their best interest of maintaining a capitalist world system. Peripheral nations are beholden to this

world system as an "ideological commitment" (Wallerstein, 1974, p. 404), because core nations have superior military strength, and because the three-tiered world system does not allow for polarization (as in Marx's bourgeoisie vs proletariat). In Wallerstein's world system, dependency was understood as a commitment to a world capitalist system, a hegemonic ideal that is upheld through institutions, power, and historical processes of exchange. In sum, it is a relational concept to describe a nation's position within the capitalist world system.

In Wallerstein's world system model of dependency, nation states functioned primarily as a tool for capitalist actors to protect their self-interests. Similarly, Cardoso and Faletto (1979), situated nations and their unique colonial histories within ongoing processes of dependency in a world system. Like Frank and Wallerstein, Cardoso and Faletto understoond dependency as "conditions under which alone the economic and political system can exist and function in its connections with the world productive structure" (1979, p. 18). For these authors, dependency in Latin America had been constructed through hegemonic conceptualizations of development and underdevelopment that are played out through economic, social and political systems. Underdevelopment is described on economic terms as a nation heavily reliant on export that has little national economic diversification. For Cardoso and Faletto underdevelopment was further defined by historical dependence – in which countries were integrated into the world capitalist system, often by way of top-down decision-making from core nations about economic development in the periphery that best served the needs of the core. Concepts of development and underdevelopment, then, are tools to subvert the power of peripheral nations, and maintain a capitalist world system that benefits the core. Within this framework, dependence is a product of the dominant developmental paradigm within the world capitalist system, measured by historical processes of colonialism and nation state building that determined national economic strategies.

Indeed, the authors suggested "extreme dependence" (Cardoso & Faletto, 1979, p. 18) is exemplified by national decision-making around production and consumption made in "terms of the growth and interests of the developed economies" (p. 18). Under Cardoso and Faletto's understanding of dependence, an extractive economy located in places characterized by "underdevelopment" are those that have deep historical roots of unequal power exchanges, operating under a hegemonic system of development that benefits the "developed" nations.

Dependency is thus an orienting concept to describe unequal processes of exchange resulting from historical socioeconomic power dynamics within a capitalist world economy. Within this framework, analyses are typically at the level of the nation-state or global region. Within a world capitalist system, both Wallerstein and Cardoso and Faletto understood nations as spaces in which powerful capitalist actors and hegemonic power influence policy. Within such a framework, national extractive economies – those oriented around the extraction and export of raw materials such as minerals, petroleum or natural gas – are typically understood as peripheral due to a lack of economic diversification (Bunker, 1984b, 1984a). In other words, extractive economies can be understood as operating within ideals of development upheld by hegemonic capitalism in which nations strive to grow economically. Dependency offers a broad lens for which to better understand national-level policy-making that his rooted in colonial histories and unequal exchange. Political economy is an interconnected lens that re-centers analysis within the national boundaries while acknowledging and accounting for historical patterns of exchange and global capitalist hegemony.

Political economy & the resource curse

Political economy is a lens that engages dependency theory and has become a predominant tradition that spans sociology, rural sociology and geography (Bailey, Jensen, &

Ransom, 2014; Jolly, 1994). The political economy lens derives from the foundational premise that socioeconomic policies and political actors are interconnected and embedded in a particular time and place. This premise is rooted in the foundational theoretical work by Polanyi (1957), in which he articulated the concept of embeddedness to contradict the concept of a truly free and self-regulating economy. Polanyi argued that the economy is embedded in politics, religion, and social relations, and thus cannot be considered truly autonomous. In other words, the political economy framework incorporates social, economic and political context into political and economic power and decision-making (Bailey et al., 2014; Lobao & Meyer, 2001). In fact, studies of political economy have a long history evaluating the social, economic, political and environmental changes in Latin America and among mineral-dependent countries around the world (Jolly, 1994; Lobao & Meyer, 2001; Santiso & Dayton-Johnson, 2012). Research assessing the resource curse hypothesis of development often implicitly or explicitly employs the theoretical foundations of political economy to contextualize dependence on natural resources. As such, resource curse and political economic theoretical frameworks are often employed in tandem and/or used interchangeably (Bridge, 2004; Haber & Menaldo, 2012; Orihuela, 2013; Ross, 1999; Stern, 2004). In Peru, the political economy of large-scale mining is a framework that encompasses Peru's unique political and economic history of dependency, economic protectionism, and (re)integration into the global economy that has determined when, how, and by whom large-scale mining development occurs and how any economic benefits are (or are not) distributed (Bebbington, Abramovay, & Chiriboga, 2008b; Bury, 2005; Ponce & Mcclintock, 2014; Sullivan, 2014). In what follows, I describe political economy and the resource curse as orienting frameworks to understand social and economic impacts of large-scale mining projects for youth in Peru.

Studies of the political economy of natural recourse extraction integrate measures of social and economic policy, political institutions, political unrest, and economic well-being (poverty, household incomes, etc.) to assess the impacts of extraction on social or environmental outcomes (Bridge, 2004; Orihuela, 2013; Schrecker, Birn, & Aguilera, 2018; Stern, 2004). Such studies are predominantly quantitative, measuring broad social and environmental change by way of longitudinal or cross-sectional variables assessing social, economic and political well-being. Empirical studies in political economy typically provide detailed sociopolitical overviews of their research context(s) in order to better situate their findings in a particular period of economic decision-making. Investments in extraction are particularly well suited for historical contextualization (Frickel & Freudenburg, 1996). For example, Frickel and Freudenburg argued that the success of extractive industries relies on four factors; existing capabilities of extractive technology (is the technology new? Old? How efficient? Widely available?), pre-existing competition (will the resource enter a market that is already saturated or dominated by another country?), linkage specialization (how specialized is the technology needed for this extraction or for the resource's intended purpose? Or are there diverse uses?), and transportation systems (the more isolated the resource, the more likely to generate local employment and manufacturing). Frickel and Freudenburg's analysis identified the structural and political determinants of natural resource extraction for development, but did not explicitly address prevailing economic paradigms and histories of dependency that inform policy decision-making. In contrast, Bridge (2004) described a prevailing "treasure chest theory" (p. 225) that drives politicians in natural resource endowed nations to view extraction as a pathway toward national wealth and development. Policies that seek to take advantage of a perceived trove of natural resource wealth were perpetuated by theoretical justifications that suggest extraction-based economic

development will correct historical and longstanding patterns of unequal development (Bridge, 2004). In sum, the political economy of resource extraction integrates historical, political and economic processes in analyses of the impacts of natural resource extraction.

In contrast to the treasure trove conceptualization of mineral wealth that has justified extraction-based development, the resource curse theory is an alternative hypothesis of mineral wealth and development that posits extraction-based economies will experience short-term economic benefits to the detriment of long-term social, economic, and environmental well-being (Bridge, 2004; Bunker, 1984; Ross, 1999). A political economy lens is often embedded within studies of the resource curse hypothesis, such that decision-making and resource extraction are understood as interacting processes that shape developmental outcomes (Kinchy et al., 2014; Ross, 1999). In his article *The Political Economy of the Resource Curse*, Ross (1999) reviewed political science and economics literature to categorize economic and political explanations for the resource curse. The author found four main economic explanations and three broad political explanations to explain the prevalence of the resource curse. Economic explanations include fluctuating international trade prices for commodities, poor trade policies and relations, and weak economic links between resource dependent and non-resource dependent nations. Political explanations include political short-sightedness, strengthened social groups that undermine economic growth, and weakened state institutions (Ross, 1999). Ross argued that few of the political explanations for the resource curse have been tested empirically, and that economic explanations typically fail to account for the role of governments and policy-making. Ross (1999) concluded that future work should integrate economic and political explanations and consider the role of additional factors, such as state ownership of extractive industries and the

state's role in enforcing property rights. In sum, Ross advocated for a political economic approach to analyzing the implications of extraction-based economies.

Empirically backed theoretical work employs dependency and political economy frameworks to situate the social and demographic impacts of natural resource extraction (Bunker, 1984), to explain child health outcomes (Burroway, 2017), and to examine the relationship between population and environmental change (Jolly, 1994). In an analysis of deforestation of the Amazon rainforest in Brazil, Bunker (1984) characterized economies based solely on extraction of natural resources as the "extreme periphery". In his example, the Brazilian government exported lumber and rubber from the Amazon in order to improve the socioeconomic conditions in the country. However, focus on short-term economic gains to meet current market demands resulted in inalterable damage and rapid decline of the Amazon's resources that would have served "the international and national economies of the future" (Bunker, 1984, p. 1055). Bunker's analysis rooted the destruction of the Amazonian rainforest in broader political and economic pressures on Brazil to participate in the global economy. In contrast, Jolly (1994) assessed how dependency theorists explain population responses to environmental change. Jolly (1994) explained that within a dependency framework, population growth associated with poverty perpetuated by unequal patterns of development and exchange puts strain on environments and causes environmental decline. However, regional political economies of institutions, landownership, access to credit and sociopolitical conditions influence the extent to which population growth impacts environmental conditions (Jolly, 1994). As such, Jolly suggested that within a dependency framework, intra-national analyses of local political economies are useful for understanding population effects on the environment.

Dependency and political economy frames are useful for understanding broad environmental, social and demographic impacts of extractive economies, and can also be helpful in the evaluation of well-being outcomes (Burroway, 2017; Schrecker et al., 2018). For example, Burroway (2017) integrated political economy, dependency, and Sen's (1999) capability approach to understand child malnutrition in the developing world. The author explained that political economists typically assess health and well-being by metrics of national economic growth. However, measures of GDP (Gross Domestic Product) may not capture sub-national variation in how such national economic growth is experienced (Burroway, 2017). Similarly, Burroway explained that dependency theorists typically focus on the role of capitalist expansion, foreign investment and trade relations as determinants of unequal economic conditions and well-being outcomes. For example, power relations between core and peripheral nations may leave peripheral countries to rely on foreign investors, who may have little interest or incentive to foster social programming and local development. This reliance may temporarily result in economic windfalls and boost a nation's international bargaining power, but such benefits are subject to market prices and often result in nations becoming increasingly specialized, cultivating national vulnerability such that market fluctuations threaten national economic stability and undermine national investment in health and well-being (Burroway, 2017; Muradian, Walter, & Martinez-Alier, 2012).

National economic vulnerability resulting from specialization implies a precarious political position in which policy-makers must balance investing in social programming and local economies with rapid, short-term national economic growth. Bunker (1984) argued that the economic benefits associated with extraction are often not reinvested in society, and ultimately lead to diminished economic opportunity and social welfare. However, efforts to re-invest profits

from extraction in social goods have a long history in Latin America (North & Grinspun, 2016).

North and Grinspun (2016) explained that extractive economies in Latin America have long

employed a neo-extractivist or developmentalist approach in which profits from extraction are

invested in social development, such as education, infrastructure and health. However, the

authors contend that such developmentalist approaches are often urban focused and foster a

climate of land dispossession to serve the national interest. Additionally, the predominant

neoliberal paradigm and accompanying policies undermined local development efforts by

concentrating power among multinational elites and unequal trade agreements (North &

Grinspun, 2016). The developmentalist approach and subsequent undermining can be understood

within frameworks of dependency, political economy and the resource curse: Histories of

colonialism and exploitation in which economic practice that is shaped under conditions of

unequal processes of exchange thwart political intentions to invest in societal well-being. Such is

the recurring theme in the resource curse literature; that of temporary economic gain at the

expense of undermining long-term economic and social well-being that is formed by local,

regional and global economic and political conditions (Bunker, 1984; Fleming, Measham, &

Paredes, 2015; North & Grinspun, 2016; Ross, 1997).

The empirical record testing the aforementioned theoretical underpinnings in extractive

economies around the world offers some support for the resource curse hypothesis, varying

greatly by the spatial and temporal scale and local political economies. At the national level,

Davis and Vásquez Cordano (2012) employed longitudinal data from 57 developed and

developing countries between 1962-1997 to analyze the impacts of extractive activity on national

poverty rates, average income and levels of income inequality. Consistent with the resource

curse hypothesis – that the economic development of resource rich nations will be undermined

by the resource extraction strategy in the long-term – the authors did not find any statistically significant evidence that periods of economic growth within extraction economies were associated with poverty reduction or declines in income inequality. Instead, they found economic growth to be associated with lower incomes for the poor, and higher levels of inequality. However, the authors noted that national-level income inequality measures are not standardized across countries, and that comparisons between countries may hide local and regional economic effects.

A number of national-level studies and community-level case studies around the globe shed light on the regional economic impacts of mining. Arguing that cross-national comparative studies of economic impacts disguise internal socioeconomic impacts of extraction, Fleming et al. (2015) evaluated economic growth in nonmetropolitan areas of Australia during periods of economic windfalls from resource industries. The authors found a resource "blessing" for mining regions associated with more mining-related employment. However, their study missed the temporal aspect of the resource curse, only evaluating effect *during* economic windfalls from mining. In addition, their study emphasized short-term, economic gains in mining employment, indicating a form of employment specialization that occurs around mining development. Indeed, Ticci & Escobal (2014) found that, in Peru, mining districts displayed more economic activity and employed more people in rural areas compared to non-mining districts. However, the authors warned of a type of economic specialization in mining regions in which labor in agricultural and other sectors declines while mining-related labor increased. Such specialization is hypothesized to be detrimental to long-term economic and social development. Aragón and Rud (2013) employed a difference-in-difference design to evaluate the regional and spillover (urban to rural) impacts of a large-scale gold mine on household income. They found the gold mine to be

associated with higher incomes, as well as increased housing prices and goods. Their findings suggest that while incomes increase, so too does the cost of living in the urbanized center nearest the mine, though the authors do not address how such wage increases and cost of living increases may be distributed unequally across the population, possibly contributing to rising inequality. The authors concluded that mining development is beneficial for short term wage increases, but suggest additional research around the implications of specialization for long term economic outcomes.

Kinchy et al. (2014) re-engaged the boomtown literature from the 1970s to assess the potential socioeconomic impacts of natural gas development in rural communities. The authors summarized literature in the U.S. around extractive industry "boomtowns" (Kinchy et al., 2014, p. 261), suggesting that there were economic gains associated with extraction, but it often fostered inequality by way of increased housing costs and demographic change. Indeed, in their discussion of how historical factors shape the success of extraction endeavors, Frickel et al. (1996) pointed out that extraction is often an unsuccessful endeavor unless it is a new resource not already integrated into the global market, or employs new technology to extract more efficiently. The authors pointed out that, in the U.S., the remnants of age-old extraction reveal more ghost towns than continuing prosperity (p. 461), suggesting a long-term diminution of socioeconomic well-being. In an assessment of the social and economic impacts of shale gas development in four counties in Pennsylvania, Brasier et al. (2014) found mixed results. They compared data on housing, education and crime before Marcellus shale development, and in the early periods of development. They found early evidence of changing housing costs and availability, limited change in school enrollment, but an increase in students qualifying for free and reduced-price lunch and a slight increase of certain crimes. However, the authors cautioned

that their findings vary by whether the county is considered rural or urban, and results were likely impacted by the economic downturn emerging at the same time as the early shale development stages.

Case-study research and studies employing cross-sectional data within the boomtown literature are regional in focus, with attention to community context, history, and community perceptions. Methodologically, many studies in the developing world also utilize cross-sectional data, and case-studies (Hinojosa, 2013; Ticci & Escobal, 2014), though there is more of an emphasis on cross-country comparison (Cuba, Bebbington, Rogan, & Millones, 2014; Fleming et al., 2015). In contrast to studies in the U.S., studies of extractive industries in the Global South are better understood within a dependency framework. The international development project which emphasizes economic growth and human development omits historical factors that have shaped current policies (Cardoso & Faletto, 1979). The subtext inherent in studies in the Global South is one of ongoing development for which extraction is understood as a tool. However, studies emerging from economics of natural resource extraction in the developing world often only evoke more recent history, omitting colonialist and unequal relations that shape a nations approach to extraction (Aragón & Rud, 2013; Ticci & Escobal, 2014).

Empirically, similar patterns of socioeconomic outcomes emerge from studies in the United States and developing countries. Short-term economic gains are often associated with extractive industries in the form of incomes and labor, but said gains are often short-lived, subject to external market prices, and felt unevenly across sub-groups in mining regions (Aragon & Rud, 2013; Fleming et al., 2015; Kinchey et al., 2014). Increased and persistent inequality is associated with extraction around the globe (Davis & Vásquez Cordano, 2012; Kinchy et al., 2014; Tallichet, 2014; Zabsonré et al., 2018). The effects of extraction on other social outcomes

such as education and employment are more mixed, varying by context and the temporal scale evaluated. Extractive economies might see an increase in school attendance in one context, but increased child labor and attendance declines in another (Jensen, Yang, & Muñoz, 2012; Santos, 2018; Zabsonré et al., 2018). Such contextual findings speak to a need for research to incorporate the social, historical and political factors that shape the long-lasting impacts of extraction on communities and countries.

An encompassing framework that integrates the roles of history, institutions, global and local economic conditions, and political power offers an interconnected lens to understand the impacts of resource extraction on youth well-being in Peru. The political economic framework situates the expanse of mining investment in the 1990s-2000s within a broader sociopolitical shift toward neoliberalism characterized by multinational investment and natural resource extraction as keys to integrate Peru into the global economy (Cuba et al., 2014; Ponce & Mcclintock, 2014; Zegarra Eduardo, Orihuela, Jose, Paredes, 2007). The dependency framework roots Peru's reliance on mineral extraction in historical processes of colonialism and international exchange that have relegated the country to a peripheral position in the global economy, constraining generations of policy-makers and social movements that have striven for a better society (Cardoso & Faletto, 1979; Dell, 2010; McMichael, 2017). Finally, the resource curse lens within a framework of dependency contextualizes economic and developmentalist policy-making aimed at increasing GDP without detrimental long-term social and environmental impacts (North & Grinspun, 2016; Ross, 1999).

On the other hand, the aforementioned frameworks focus on aggregate, national and regional-level analysis, offering limited utility at explaining within country variation and individual-level experiences of well-being associated with extractive industries (Burroway, 2017;

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Lobao & Meyer, 2001). For example, Lobao and Meyer (2001) explain how political economy often ignores individual agency and overlooks sub-national and community-level impacts in their analysis of the great agricultural transition in the United States. In addition, traditional political economic studies ignore individual-level social differences (gender, age, race, geography) that impact experiences and outcomes (Burroway, 2017). For example, ample evidence suggests the impacts of mining are gendered, effects not sufficiently captured by way of macro-level analyses (Eftimie et al., 2009; Oxfam, 2017; Park, Metzger, & Foreman, 2019). Therefore, additional lenses are needed to explore individual agency and (gendered and geographic) experiences within local political economies of large-scale mining projects. Following an integrated theoretical framework proposed by Burroway (2017), I incorporate Sen's (1999) capabilities framework to understand youth well-being in the context of proliferating large-scale mining projects in Peru.

Capabilities

In Amayta Sen's (1999) book *Development as Freedom*, he described a theory of human capabilities embedded within the concept of freedom. In Sen's view, freedom is made up of individual capabilities, which are realized and constrained by local political and social environments (i.e., political economies). Freedom, argued Sen, is integral to development in that it allows people to help themselves, to thrive, and to pursue meaning in their lives. Development, in turn, is a "process of expanding real freedoms that people enjoy" (Sen, 1999, pg 36). A person's capabilities refer to their ability to do things within physical, social and material constraints. Thus, capabilities reflect both the extrinsic (opportunities for education, access to health care, local economic conditions) and intrinsic (aspirations, motivations, identity) constraints on human well-being and outcomes. To illustrate, Sen offered an example of poverty

alleviation and income earning potential. An individual's earning potential is dependent both on academic or experiential qualifications that are themselves dependent on a range of biological, socioeconomic and geographical conditions that are outside of and individual's control, such as location (rural, urban, global North, global South), gender, age, disability, and local economic conditions. A person's capabilities – or freedoms – to escape impoverished conditions are limited by social, cultural, geographical and biophysical constraints to their earning potential. For Sen (1999), poverty is thus a form of capability deprivation in that it limits individual freedom to achieve what they would like to achieve. Therefore, Sen suggested assessing poverty using multiple metrics in addition to income, including unemployment, health outcomes, literacy and educational attainment – all of which contribute to a person's capabilities. For Sen, development interventions targeting education, well-being, food security, and health enhanced individual capabilities. However, Sen did not contend that alleviating poverty or enhancing income earning potential should be the goal of development. Instead, Sen argued for a form of development that enhances individual capabilities to achieve and pursue happiness and enjoyment (Sen, 1999). As such, Sen's vision for development was at odds with the hegemonic capitalist development model encompassed within Peru's extraction-based political economy underwritten by unequal relationships of dependency (Cardoso & Faletto, 1979; Wallerstein, 1974). Therefore, Sen's capabilities framework offers a complementary lens that transcends traditional and hegemonic notions of development.

Subjective, individualized metrics for a good life and happiness are difficult to assess analytically, and some have critiqued the capabilities framework for its empirical ambiguity (Burroway, 2017). Understanding capabilities as individual freedom to attain well-being and pursue subjectively defined fruitful activities makes measuring and comparing capabilities

difficult. While Sen (1999) resisted facilitating the quantification of capabilities, many studies employing this framework have used educational outcomes, sanitation, and access to healthcare as metrics for comparison (Burroway, 2017). In the present study of youth well-being and the impacts of large-scale mining projects, the subjective nature of the capabilities framework is important for contextualizing youth aspirations within the political economy of large-scale mining as a national development strategy.

In the context of large-scale mining projects in Peru, youth outcomes, well-being, and aspirations are theorized to be influenced by a number of biophysical and contextual capabilities, including gender, rurality, socioeconomic status and ethnicity. In fact, the impacts of large-scale mining projects have been demonstrably gendered (Eftimie et al., 2009; Oxfam, 2017; Park, Metzger, & Foreman, 2019). Mining employment has predominantly gone to men, and the arrival of large-scale mining projects has been associated with shifting gender roles and responsibilities (Ferrant, Pesando, & Nowacka, 2014; Oxfam International, 2017). In addition, scholarship from Peru has demonstrated that gender, geography and ethnicity play significant roles in shaping educational aspirations (Ames, 2013; Dercon & Singh, 2013). Parental expectations for young girls' educational attainment have been found to be higher in urban areas in Peru than in rural areas (Dercon & Singh, 2013). Young rural woman may aspire to higher education as a pathway away from gender-based violence and oppressive gender relations (Ames, 2013). Young women are often expected to perform household domestic responsibilities while pursuing higher education that their male counterparts do not perform. In addition, rural young women are often expected to work to pay for their education compared to young women from urban areas (Guerrero & Rojas, 2020). Finally, while female enrollment in higher education has outpaced that of young men in Peru over the past two decades, women remain under-

represented in certain fields (science, technology) and over-represented in others (education, health) (Guerrero & Rojas, 2020). Given the gendered and geographic determinants of youth well-being within Peru's political economic context, this project draws from the theoretical the foundations of multiple memberships and identities (Sen, 1987).

Individual-level outcomes in the context of a broader large-scale mining political economy are shaped by multiple, intersecting identities and group membership (Carbado, Crenshaw, Mays, & Tomlinson, 2013; Crenshaw, 1989; Davis, 2008; Sen, 1987). In Sen's (1987) view, gender, family, geography, ethnicity and nationality can be understood as multiple – at times competing – identities that influence our behavior, well-being and intentions for the future. Within Sen's framework, individuality, or one's sense of self, can be primarily influenced by different factors at different times. Such factors that make up an individual's identity are considered both identities and memberships in Sen's (1987) terminology, and include things such as family, gender, status/class in society, occupation, and nationality. The shifting influence of each aspect of one's identity limit or enhance one's freedom to fulfill a life of value. For example, membership in a family and role within the household (as the oldest child, only child, daughter or son) could be the primary influence shaping a young person's aspirations at a given time. Simultaneously, gender could influence which aspirations are perceived as attainable in a given context. Contextual factors such as belonging to a rural or urban community has the potential to have outsized influence on a young person's capabilities in the Peruvian context (Cuento & Felipe, 2018; Cuervo, Montalava, & Rodriquez, 2011). As such, Sen's conceptualization of social difference is rooted in a person's agency and (cap)ability to achieve what they aspire to achieve given multiple identities and memberships. In what follows, I

describe how youth, youth well-being, and aspirations are understood in this research project within capabilities, multiple memberships, political economy and dependency frameworks.

Conceptualization of youth

Youth around the world represent a fifth of the global population, and nearly a quarter of Peru's current population, positioning young people as significant social, political, cultural, and economic drivers (INEI, 2022; Juárez & Gayet, 2014). Demographic work by Rindfuss (1991) defined the young adult years as being demographically dense in terms of the amount of "demographic action" (p. 496) that occurs. Specifically, the time between transitioning from childhood to adulthood was characterized by (first) child bearing, employment, migration and marriage. Indeed, the conceptualization of "youth" is often described in terms of transitional events that characterize moving from childhood to adulthood, including forming romantic unions, transitioning away from the family home, completing school and finding employment (Gauthier, 2007; Grant & Furstenberg Jr., 2007). However, Rindfuss (1991) suggested that the linear ordering of such events from finishing school, finding employment, forming a union or marriage and child bearing was becoming increasingly heterogenous (disordered in Rindfuss' vernacular) among youth in the U.S. Scholarship addressing youth and youth well-being in the past two decades has questioned how and when transitions to adulthood are defined, suggesting that such transitions are contextual and cultural in ways that evade universalization. For example, Grant and Furstenberg (2007) evaluated the diversity of combinations that typify youth transitions to adulthood (school enrollment, employment, marriage and parental status) in countries across Latin America and Africa. In Peru, the authors identified ages 18-21 to be characterized by the most heterogenous status combinations, suggesting transitions to adulthood in that context are far from universally accepted linear trajectories. Their findings offer insight

into the extent of variation in youth's transitional processes, but do not address whether such transitional processes differ between sub-populations (i.e. by gender, geography), or if the quality of such transitions have changed over time.

In their introduction to a special edition on transitions to adulthood, Gauthier (2007) suggested that current frameworks evaluating youth transitions focus on discrete events (marriage, divorce, childbirth) and heterogeneity in the ordering of such events, but lack analysis of youth well-being. Gauthier (2007) suggested more attention was needed to the consequences of youth transitions for their social, economic, and psychological well-being. In addition, the authors called for attention to linkages between micro (culture, community) and macro (economic policy, institutions) to be integrated into studies of youth. As the presumed generational beneficiaries of any "development" associated with an extractive economy, youth well-being sheds light on the efficacy of policies facilitating extraction (Ansell, 2016). In other words, if youth in Peru are thriving under extractive development, policy-makers should expect less push-back or unrest that could destabilize local political and economic conditions (Maconachie, 2014). As such, youth well-being holds a mirror to Peru's political economy, reflecting back its current and long-term utility. Therefore, this study seeks to fill a gap in the literature by focusing on the political economies in which youth operate with attention to both discrete events *and* subjective perceptions of well-being.

Within the development discourse, Ansell (2016) described how youth are often employed in instrumental ways within the development apparatus, "in ways that service a changing global economy" (p. 506). In their analysis of children and youth as discussed in reports issued by the World Bank and UNICEF, Ansell (2016) identified five broad examples of how children and youth are typified as (1) indicators, (2) illustrations, (3) objects of policies or

interventions, (4) points of social investment, and as (5) agents, actors and subjects. The author alluded to the soft power of these organizations at shaping the international development agenda. For example, developmental interventions in which youth and children were targeted have long focused on reducing child labor, increasing educational attainment, and on interventions to avoid teen pregnancy. The purpose of such interventions has been under the guise of development, justifying social interventions and political investment. As such, investments in youth educational attainment and employment opportunities were understood as investments in societal futures (Ansell, 2016). Critics contend that viewing youth as our national and societal future – and hence, in service of a broader agenda in which youth are future economic actors – "denies young people's subjectivities; they have no meaningful existence in the present" (Ansell, 2016). Macro-oriented frameworks of political economy and dependency provide a critical lens through which youth are positioned as objects of developmental intervention to serve broader sociopolitical goals. Integrating the conceptualization of youth from a capabilities perspective positions youth as individual actors who's capability development *should* and *could* enhance their subjective well-being and ability to live a meaningful lives.

In the context of natural resource extraction, youth have often been employed in developmentalist terms to frame debates about the community impacts of extractive industries (Coffey et al., 2018). For example, Coffey et al. (2018) analyzed the way 'youth' were employed in community debates about a proposed Coal Seam Gas project in northern Australia. Specifically, youth were presented as representations of the community's future, for which the project would either be 1) an employment opportunity that will retain young people, or 2) a long-term push factor due to environmental degradation that will exacerbate the youth brain drain (Coffey et al., 2018; Sherman & Sage, 2011). In fact, concerns about highly skilled youth with

high aspirations leaving rural communities for better opportunity has long been the focus of rural studies of youth (Sherman & Sage, 2011). Examples from Canada, Australia and the U.S. revealed how the idea of opportunities for youth was often employed in developmental discourse to justify or oppose extractive projects (Coffey et al., 2018; Davison & Hawe, 2011; Sherman & Sage, 2011). Such characterizations of youth as an instrument for community development overlooks how youth themselves view such projects and their own views and hopes for the future.

In Peru, large-scale mining development has the potential to impact youth transitions and outcomes in profound ways. In addition to the perceived employment benefits, modern large-scale mining developments by multinational companies are often accompanied by investments in infrastructure, education, and training in impacted communities in order to mitigate possible social conflicts and build a well-trained, local work force (Bury, 2005; Crivello, 2015b). This may provide youth with better and broader educational opportunities and local work opportunities that were not previously available. In other words, large-scale mining development has the potential to enhance certain capabilities for youth to live meaningful lives by boosting educational and employment opportunities. However, youth in Peru are not a monolith, and opportunities for education or employment within the mining complex may not define a meaningful life for many. In addition, such enhanced capabilities may not be felt evenly across axes of gender and geography. Mining employment has historically been predominated by men, and higher educational opportunities are concentrated in urban areas, forcing youth from rural areas to migrate or commute to access higher educational pursuits (Crivello, 2011; Eftimie et al., 2009; Segerstedt & Abrahamsson, 2019). It is within this context that this project situates youth outcomes, well-being and aspirations within a broader political economy of large-scale mining

development. I now turn to a discussion of how youth well-being and aspirations are conceptualized in this study.

Youth well-being and aspirations

Well-being is a complex concept that eludes easy definition. Demographic and environmental research often focuses on quantifiable, health-based indicators of childhood well-being, such as height, weight, nutrition, exposure to environmental contaminants, and vaccination records in early life (Cox, Irwin, Scannell, Ungar, & Bennett, 2017; Yount, Zureick-Brown, Halim, & LaVilla, 2014). Sociological and policy research focused on children's and youth's well-being outcomes typically employs measures of education (enrollment, attainment, completion, grade-for-age), employment, and civic or social engagement (participation in sports, clubs, organizations, voting behaviors) (Ames & Rojas, 2009; Chaaban, 2009; OECD, 2017) For example, Chaaban (2009) developed a statistical method for calculating a Youth Welfare Index to capture welfare using measures of social exclusion and metrics from the Human Development Index (HDI) such as school enrollment, employment, and literacy to facilitate cross-national comparisons of youth welfare. In Peru, Ames and Rojas (2009) conducted a literature review of children and youth well-being in Peru, finding most of the literature focused on education (quality and quantity), preventing violence and exploitation, and health measures (preventing STIs such HIV/AIDS). The OECD (2017) produced a comprehensive report on youth well-being, assessing both quantifiable metrics of well-being such as employment and educational attainment, as well as qualitative assessments of thematic subjective well-being indicators drawn from interview data. Aligning with this prior work, youth employment and educational attainment are considered useful metrics in the present study for gauging youth well-being in the context of large-scale mines.

Qualitative social science research has sought to capture more nuanced and holistic measures of well-being. For example, Riley-Powell et al (2018) employed qualitative research tools to evaluate Subjective Well-Being (SWB), which included utilizing a scale visualized as a ladder (a "Happy Ladder") to rank overall life satisfaction in Peruvian communities in response to road construction. Park (2004) advocated for a stronger consideration of subjective well-being in studies of youth. The author suggests that measures of youth's own perceptions of their lives – their life satisfaction – is a better metric for understanding subjective youth well-being (compared to measures of self-esteem or agency). Studies evaluating life satisfaction found higher youth satisfaction to be associated with lower rates of smoking and drinking and reduced likelihoods of adolescent pregnancy and depression, as well as with better health-related behaviors such as eating well and exercise. Others have focused on the contextual and cultural significance infused within subjective experiences of well-being (Crivello, Camfield, & Woodhead, 2009; Gough & McGregor, 2007). In a discussion of methods to study children's subjective well-being, Crivello, Camfield and Woodhead's (2009) contend;

> *Well-being is a socially contingent, culturally-anchored construct that changes over time, both in terms of individual life course changes as well as changes in socio-cultural context.* (p. 53)

The authors advocate for methodological tools such as group discussions, timeline interviews, drawing and mapping that elicit experiences from children to better assess their well-being. Similarly, Gough and McGregor (2007) pushed for holistic measures of well-being in developing countries drawing heavily from Sen's (1999) conceptualizations of capabilities and freedoms. They argue for a shift away from purely economic and poverty-based measures of well-being to include indicators related to Sen's capabilities and freedoms, such as agency, resource

availability and subjective lived experience. The authors developed a framework to study well-being in developing contexts, typified by intersecting elements of the capabilities framework:

> *1 the resources that a person is able to command;*
> *2 what they are **able to achieve with those resources**, and in particular what needs and goals they are able to meet; and*
> *3 the meaning that they give to the goals they achieve and the processes in which they engage. A key element of this last dimension of meaning, and a basic driver of the future strategies and **aspirations of the person**, is the quality of life that they perceive themselves as achieving.* (McGregor, 2007, pg. 317, **emphasis added**)

Within this framework for studying well-being, aspirations are paramount for understanding meaning in young people's own accounts and perceived freedoms to pursue meaning in their lives. In other words, to elicit and assess individuals' aspirations is to get a sense of their lived experiences and how they shape who they intend to be. In an analysis of Peruvian youth's migration aspirations, Crivello, (2015) articulated that "aspirations, by definition, embody a sense of the future, they also influence and represent people's orientations, values, and actions in the present" (pg. 5).

Aspirations are often the target of policies aimed at youth and youth outcomes, embedded in narratives about youth transforming themselves in order to have a better life (Azaola, 2012; Corbett & Forsey, 2017; Zipin, Sellar, Brennan, & Gale, 2015). However, policy efforts to raise youth aspirations, particularly among marginalized or lower socioeconomic groups, often overlook contextual realities that shape youth aspirations (Zipin et al., 2015). For example, in Mexico, Azaola (2012) found that marginalized youth primarily strove for "mainstream goals" (p. 877) that allowed them to feel integrated in society. Nevertheless, societal expectations and policy interventions aimed at raising youth aspirations persist. In an analysis of rural youth out-migration and aspirations, Corbett and Forsey (2017) described an "aspirational discourse" (p. 430) that encourages youth to strive for optimal educational and employment outcomes and

situates young people as "neoliberal actors" (p. 430) within a broader political economy. However, aspirational interventions among rural youth, argued Corbett and Forsey (2017) implicate mythical employment expectations and availability that are in continual flux. Youth aspirations in this research framework are thus understood as contextual reflections of young people's current reality and expectations for the future, indicative of their overall well-being.

Conceptual Map

To conclude, Figure 2.1 displays a conceptual map of the interconnected theoretical lenses through which I evaluate youth well-being, outcomes and aspirations in the context of large-scale mining in Peru. Within this framework, large-scale mining projects are embedded within Peru's political economy, which is – in turn – embedded within historically unequal relationships of dependency. Large-scale mining projects alter the social, economic and material context in which youth operate, thus shifting the capabilities at their disposal. Capabilities are, in turn, influenced by individual identities. The interconnections between capabilities and identities are understood as the primary predictors of youth outcomes and aspirations. With this framework in mind, I now turn to a description of the study methodology.

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│   │                 Political Economy                 │    │
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│   │      │    Large-scale Mining Project     │        │    │
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Figure 2.1: Conceptual framework to understand youth well-being, outcomes and aspirations in large-scale mining contexts

Chapter 3 – Review of Relevant Literature

Chapter Introduction

Research evaluating the impacts of large-scale extractive industries is vast, spanning multiple disciplines and varying widely by scope, scale and methodological approaches (Aragón & Rud, 2013; Bebbington, Humphreys Bebbington, et al., 2008; Bury, 2005; Castillo & Brereton, 2018a; Sanches & Oliveira, 2019; Steel, 2013; Ticci & Escobal, 2014; Wilson, 2012). In this literature review, I focus on studies emerging from sociology, economics, geography and demography on the impacts of large-scale mining projects, emphasizing research in the Global South. I begin by describing how large-scale mining projects are defined and what they entail, followed by a review of key literature assessing the impacts of large-scale mining projects organized into five broad categories: socioeconomic, demographic, environmental, gendered, and youth. While this chapter is organized within broad categorizations of large-scale mining impacts, such effects are conceptualized as interconnected. For example, environmental change associated with mining activity may bring about livelihood changes (socioeconomic impacts) as land and water quantity and quality is diminished by mining activity. Gendered roles and responsibilities (gendered impacts) may accompany such livelihood changes and access to natural resources (Bebbington, 1999; Li, 2013). I then turn to a review of the Peruvian research context, detailing the history of large-scale mining and concluding with an overview of contemporary youth well-being and demographics within this specific sociopolitical setting.

Large-scale mining development

Large-scale mining development or industrial mine operations refer to mining projects that require a high level of economic investment, often requiring heavy machinery, governmental and social permits, and a large, sustained labor force (Godoy, 1985). Increasingly, large-scale

mining developments are funded in the Global South by large multinational corporations (Bebbington, Humphreys Bebbington, et al., 2008; Bridge, 2004). Such projects compete with and occasionally subsume artisanal or small-scale mining operations, which often require low-tech extraction methods and can be done by individuals or small groups (Pokorny, von Lübke, Dayamba, & Dickow, 2019). In many contexts, artisanal mining operations are informal or unregistered with state governments. They have been found to have localized economic benefit, though environmental, social, and health impacts can be significant (Pokorny et al., 2019; Sovacool, 2019). In contrast, investment in industrial, large-scale mining projects is often couched in political discourse as a national development strategy (Jacob & Pedersen, 2018; North & Grinspun, 2016). The national-level economic benefits are observed through metrics such as GDP, while benefits to communities affected by mining developments are often limited (Farjana, Huda, Parvez Mahmud, & Saidur, 2019; Ticci & Escobal, 2014).

The life-cycle of large-scale mining projects begins with the exploration phase of the project, identifying sources of minerals and acquiring both technical, political and social licenses to operate (Godoy, 1985; Maconachie, 2014). The next stage of a large-scale mining project is the pre-extraction or construction phase, in which the necessary land is acquired and infrastructural developments such as roads and labor camp settlements are created to facilitate the flow of people and goods into and out of the mine (Werner et al., 2019). The third stage in the project's life-cycle is extraction and refining, often referred to as the "boom" stage in reference to the substantial human and economic inputs required to manage and maintain the mine's operations, windfall profits and localized economic benefits (Freudenburg & Wilson, 2002; Werner et al., 2019). Both the construction and extractive states of a mine's life cycle are particularly relevant to rural areas and economies. Often located in remote areas, communities

and cities neighboring large-scale mining projects often begin to cater services such as food, cleaning and hospitality to meet the needs of the influx of laborers and professionals (Bury, 2005; Castillo & Brereton, 2018b; Werner et al., 2019). Following these booming economic stages, industrial mines complete their life-cycles when extraction is completed and the mine closes. The closing stage of large-scale mines is often associated with deep and widespread social and economic impacts for the communities that have become dependent on the project, conceptualized in the resource curse literature as the "bust" period of a mine's life cycle (Brown, Dorius, & Krannich, 2005). For the purpose of this research project, I focus on the pre-extraction and extraction phases of large-scale mining projects. These phases encompass the pre-extraction construction and land acquisition and subsequent extraction, processing, and mobility of goods and people that proliferated in Peru throughout the 1990s and early 2000s, generating widespread changes to physical environments, infrastructure, employment, human mobility and social connections (Bebbington, Humphreys Bebbington, et al., 2008; Bury, 2005; Ticci & Escobal, 2014; Zegarra Eduardo, Orihuela, Jose, Paredes, 2007). With this in mind, I now turn to a review of literature assessing the impacts of large-scale mining projects.

Socioeconomic impacts

The economic impacts of large-scale mining have been extensively researched in social and economic fields, though existing research predominantly focuses on economic impacts (incomes, poverty) and social impacts (schooling, livelihoods, conflict). (Aragón & Rud, 2013; Davis & Vásquez Cordano, 2013; Fleming et al., 2015). Despite a growing body of empirical evidence, policy makers continue to encourage and facilitate mining investments – including those adopted in Peru – reflecting a belief that extractive industries are associated with economic growth (Fleming, Measham, & Paredes, 2015). However, cross-national studies of mining have

found limited support for the positive economic impacts of extractive industries at the national level (Davis & Vásquez Cordano, 2013; Fleming et al., 2015; Gamu et al., 2015). For example, Davis and Vásquez Cordano (2012) evaluated whether extraction-based economies reduce overall poverty and inequality at the national-level. Specifically, the authors utilized longitudinal data from 57 developed and developing countries to analyze the impacts of extractive activity on national poverty rates, average income and levels of income inequality. The authors did not find any statistically significant evidence that increased extraction in a country was associated with changes in overall levels of poverty or inequality, but noted between-country comparisons conceal within-country local and regional economic effects (Davis & Vásquez Cordano, 2013; Fleming et al., 2015). In an international comparative test of the resource curse, Apergis and Katsaiti (2018) assessed 79 countries dependent on the export of natural resources (e.g. coal, natural gas and oil) between 1992 and 2014 to test the effect on reducing poverty. The authors found all types of natural resource dependence to be associated with exacerbated poverty at the national-level. Finally, in a review of 52 empirical studies evaluating the impacts of mining on poverty, Gamu, Le Billon, and Spiegel (2015) found industrial mining to exacerbate poverty on average, while artisanal mining tended to reduce it. However, the authors point to variation in cross-national and sub-national studies, suggesting a need for future work that integrates assessments at local and national scales, across sectors, and that accounts for variation by the scale, scope, and indicators included in the analysis (Gamu et al., 2015). Furthermore, evidence that mining either exacerbates or fails to alleviate national poverty does not nullify national GDP growth associated with mining investments and export, regardless of whether such growth is felt locally.

Studies focused on the national and sub-national cases of large-scale mining reflect more contextualized experiences and associated impacts. In the United States, unlike in much of the developing world, extraction and mining "precede industrialization" (Bridge, 2004, p. 225), lending credence to some that claim investments in extraction will help nations along the hegemonic developmental trajectory. Among proponents of investments in extractive industries, mining has been put forward as necessary for the process of industrialization given the historical records of industrialized nations (Bridge, 2004). Indeed, the long history of extraction in the United States offers insight into the long-term impacts of extraction on socioeconomic outcomes. Freudenburg and Wilson (2002) undertook an assessment of the entire United States in order to evaluate the regional and temporal effects of extraction by comparing nonmetropolitan mining regions with all other nonmetropolitan regions in the US over time. They found strong support that mining has exacerbated unemployment and poverty. Wages were found to be higher in some mining areas, but they did not offset higher levels of poverty in those same regions. In the Appalachian coal mining region, the long-term effects of extraction have undermined the natural capacity of environmental resources, negatively affected the health and well-being of communities by way of water contamination, and the region continues to be plagued by high unemployment and poverty (Tallichet, 2014). However, the authors layed out factors that could foster healthy and economically stable extractive communities. For example, coal mining communities in the Western US heavily taxed mining companies during the economic boom periods, providing additional revenue for local governments to utilize as the economic benefits wore off and social costs augmented. Tax revenues from mines were used for infrastructure (i.e., roads that can support heavy-load trucks), or social programs and housing for low-income populations affected by the changing economy (Tallichet, 2014). In addition, economic

diversification rather than specialization in mining communities served as a long-term economic buffer. Tallichet (2014) found that, compared to Appalachian mining communities, mining communities in the Western US with more diversified economies were better able to withstand economic decline as mines became less economically beneficial. Such examples offer contextualized evidence of the impacts of extraction over time, building on existing evidence about the role of local and national policies as paramount to protecting social well-being against the long-term environmental and economic impacts of extraction (Gamu et al., 2015; Ponce & McClintock, 2014). However, the socioeconomic impacts of mining in the Global South are embedded in historical precedents of colonization and dependency that are not reflected in studies emerging from the U.S.

In the Global South, impacts associated with extractive industries vary, ranging from increased inequality, improved schooling outcomes, increased child labor, negative health impacts, and shifting sexual behaviors (Arellano-Yanguas, 2017; Santos, 2018; Schrecker et al., 2018; Wilson, 2012; Zabsonré et al., 2018). For example, in Burkina Faso, national economic growth for the past 20 years was built on gold extraction for export, providing a strong test case for the impacts of sustained mining presence (Zabsonré, Agbo, & Somé, 2018). In a comparison of gold producing and non-gold producing regions, Zabsonré et al. (2018) found mining regions to have lower levels of poverty and higher net school enrollment, but higher rates of child labor and inequality. In Colombia, Santos (2018) tested whether human capital development was undermined by the presence of mines. Using census data from three time points, the authors demonstrated that the presence of a gold mine led to reduced unemployment at the regional level, but increased the odds of child labor and children missing school, potentially affecting long-term human capital accumulation and social and economic well-being. Pokorny, von Lübke,

Dayamba, and Dickow (2019) examined of the impacts of mining on livelihoods in Burkina Faso. The authors disentangled artisanal mining impacts from those of industrial mines, selecting three district-level case studies with industrial mining, artisanal mining and no mining within to different provinces. By way of surveys, the authors found that artisanal mining was a source of important household income generation, while industrial mining offered no direct benefits besides payments to families for resettlement. Those affected by industrial mines had more negative outlooks for the future compared to those unaffected by mining or by artisanal mines. Overall, industrial mining has been found to have little impact on household livelihoods, providing additional evidence as to the limited positive spillover from large-scale mining operations (Pokorny et al., 2019).

In Peru, a handful of studies have employed quantitative approaches to assess the socioeconomic impacts of mining. Economists Ticci and Escobal (2014) employed a difference-in-differences design to compare mining districts in the Peruvian highlands to non-mining districts, using census data from 1993 and 2007 to evaluate a number of socioeconomic outcomes, including migration, labor market activity, poverty, education and child labor outcomes. In their study, they defined mining districts as those with an active mine located in the district, or where the average number of mining workers is above average compared to districts with at least one mining worker. They distinguished between old-mining districts (those that had a mine before 1993) and new-mining districts (those that received a mine between 1993 - 2007), compared to non-mining districts, using a counterfactual framework to assess areas that *could have* theoretically received mines. They found mining expansion, particularly in areas with new mines, to have increased employment due to labor market opportunities in the mining sector, increased in-migration rates, and higher levels of education overall. In another study of one

mining region in Northern Peru, Aragón & Rud, (2013) evaluated the impacts on cost of living and average incomes for one mine, Yanacocha. They found most economic benefits between 1997 and 2006 were in the region's urban center for those working in service and unskilled labor positions. They found incomes increased for those closest to the city, though cost of living also increased. The emphasis on wages, employment and cost of living in these studies may overlook social impacts of the mining project, such as social stratification and rural out-migration identified by Bury (2005). Bury (2005) assessed the impacts of the same mining project from a lens of land tenure and livelihood practices within a framework of national neoliberal restructuring. The author found mining to be associated with increased economic gains (job opportunities) and human capital (increasing educational access), but also with land and water degradation and a decline in social organization. The degradation of natural areas shifted livelihood strategies in rural areas dependent on natural resources, resulting in increasing migration, salaried labor, or selling off land (Bury, 2005). These studies elucidate the significance of scale and the lens through which mining impacts are assessed in Peru and beyond, suggesting broad indicators of employment may confound the shifting and increasingly precarious nature of labor.

The body of work assessing the impacts of large-scale mining developments points to a pattern of localized wage increased, (sector-specific) employment, and educational attainment (Apergis & Katsaiti, 2018; Aragón & Rud, 2013; Freudenburg & Wilson, 2002; Santos, 2018; Ticci & Escobal, 2014). However, such benefits are undermined by a rising cost of living, increased social inequality, and employment opportunities that are increasingly transient, temporary, and require migration (Bebbington & Humphreys Bebbington, 2018; Bury, 2005; Hinojosa, 2013; Paredes, 2019; Pokorny et al., 2019). In fact, in contrast to the substantial body

of work employing quantitative measures of socioeconomic outcomes, qualitative research offers insight as to how the impacts of extraction influence livelihood strategies, household decision-making, and social conflict (Bebbington & Bebbington, 2018; Hinojosa, 2013; Paredes, 2019; Petrova & Marinova, 2013; Segerstedt & Abrahamsson, 2019). For example, in the southern highland region of Peru, Hinojosa (2013) evaluated the human, physical, natural, social, and financial capital impacts of large-scale mines in two communities. The author scrutinized the impact of mining for three age-groups: the elderly, working-age adults (parents) and children. Hinojosa found livelihood-associated migration among the parent population, promoting off-farm livelihood diversification associated with land dispossession. However, the author noted that intra-community inequalities generated selective labor-migration, with those lacking human and social capital remaining trapped in small communities with reduced access to land. In Australia, Petrova and Marinova (2013) assessed community perceptions of mining, finding perceptions of population transiency and concerns about dependency on the industry. Finally, in Congo, a mixed-methods study found cobalt mining to be associated with reduced regional poverty and enhanced economic stability, but also with environmental degradation, and increased violent conflict (Sovacool, 2019).

In sum, what emerges from the body of work assessing the social and economic impacts of mining development is a pattern in which large-scale mining projects are associated with higher incomes, higher costs of living, lower unemployment, and changes in educational attainment, coupled with increasing inequality, exacerbated poverty, livelihood changes, and social and community conflict (Apergis & Katsaiti, 2018; Aragón & Rud, 2013; Bury, 2005; Hinojosa, 2013; Pokorny et al., 2019; Santos, 2018; Steel, 2013; Wilson, 2012). Different methodological approaches, research questions, scale, and scope of inquiries reveal

contextualized impacts of large-scale mining that vary given different social and political

landscapes. Variation suggests an integrated political economic and capabilities framework is

well suited to evaluate local and individual-level outcomes within the broader (inter)national

socioeconomic context.

Demographic impacts

> *Mining not only changes physical landscapes, but the structure of local economies, the composition of communities and how people relate to each other. Some of these changes may be planned or managed, but often they are not.* (Castillo & Brereton, 2018, p. 461)

Large-scale mining projects have been shown to be associated with localized

demographic change associated with increased migration and fertility (Godoy, 1985). One of the

most widely discussed and significant social and demographic impacts of mining is the influx of

migrants (Bainton & Banks, 2018; Castillo & Brereton, 2018a; Moran, 2016; Steel, 2013). Rapid

increases in the local population put pressure on local environments and health infrastructure and

can spur local conflict. In Brazil, Moran (2016) discussed the ways in which two large-scale

projects – the TransAmazon Highway and the Belo Monte Dam – affected populations over

time. The author concluded that the mismatched speed of private investment and development

with public infrastructure can lead to a lack of services for rapidly growing populations in

communities affected by development, such as a lack of health services, schools, teacher

shortages, or trash waste disposal services. Such large-scale development projects offer insight

into the impact of infrastructure development on demographic outcomes. Indeed, research

assessing the impacts of in-migration on local communities reflect findings from the boom town

literature in the U.S. An influx of workers for resource extraction or infrastructural development

creates a "boom" in small, rural communities, unprepared to meet the needs of a population

influx (Ramsaran & Rousu, 2016). Thus, population growth associated with migration booms for

mining employment are associated with localized economic growth but put strain on local public services.

A handful of studies have assessed the interconnected impacts of mining and migration in the Global South. In an ethnographic study in Peru, Steel (2013) documented the rapid population growth of two Andean cities impacted by large-scale mining and tourism industries. The author documented how one northern Andean city, Cajamarca, near the largest gold mine in the country, experienced rapid population growth, both from rural in-migrants from neighboring rural communities, as well as international and domestic migrants. Rural in-migrants primarily found low-paid employment, such as temporary employment in construction or with the mine. High skilled in-migrants from other countries or Peru segregated their children in private educational institutions with high fee structures that excluded most of the local population, contributing to increasing wealth disparities in the city (Steel, 2013). Another case study in Peru focused the impact of a large-scale mining project on mobility in the nearest city hub (Chiclayo) in the northern coastal region (Castillo & Brereton, 2018). The authors argued that most studies focus on mobility away from the immediate vicinity of mining projects that may overlook broader networks of migration flows to neighboring cities and towns. Further, the authors contended that most studies of mining and mobility focus on the negative consequences, such as price inflation and loss of community cohesion. Drawing from participant observation and interviews, the authors found economic growth during the exploration period preceding the mine was associated with an influx of youth with new ideas and disposable income into the nearest city – Chiclayo. Women experienced increasing mobility and freedom, though the authors noted that women's mobility was still more limited than men's and gender violence persisted (Castillo & Brereton, 2018). On the other hand, in Melanesia, in-migrants associated with mining

development were often met with marginalization and poor living conditions, entrenching community perceptions of difference and garnering community divisions (Bainton & Banks, 2018). In sum, the social impacts of mining-related demographic change have been mixed, associated with augmented social inequalities and division, and shifting social norms and behaviors.

The link between mining development and fertility has garnered less empirical attention, though early demographic research found higher fertility rates among coal miners compared to rural inhabitants neighboring mines (Godoy, 1985). More recently, some scholarship has explored behavioral changes in sexual activity and childbearing associated with large-scale mining developments (Shandro, Veiga, Shoveller, Scoble, & Koehoorn, 2011; Wilson, 2012). In Canada, a rural coal-mining region was found to have higher rates of sexually transmitted diseases and an increase in pregnancies associated with the peak coal production period (Shandro et al., 2011). In Zambia, Wilson (2012) evaluated how the economic boom associated with copper mining correlates with engagement in risky sexual behavior in mining towns. Zambia is one of the largest producers of copper and has high rates of HIV transmission. The author demonstrated how the economic growth associated with increased copper prices between 2003 and 2008 was associated with decreased risky and transactional sexual behavior in mining cities. Risky sexual behavior was measured by number of sexual partners in the past year, premarital sex, use of a condom, and whether or not money is exchanged. The author hypothesized that the increased standard of living attributable to mining employment reduced risky sexual behavior by improving dating and marriage markets and reducing women's willingness to engage in transactional sex. They found that younger men engaged in less risky sexual behavior in mining towns compared to non-mining areas, and the rate of adolescent pregnancy was lower among

young women in mining towns compared to non-mining towns (Wilson, 2012). In sum, empirical work assessing the demographic impacts of large-scale mining developments reveals patterns of in-migration to small towns and cities and out of rural areas that can overwhelm local services, increase inequality, and shift sexual behaviors and attitudes.

Environmental impacts

The environmental impacts of large-scale mining developments vary widely by the type of minerals, the phase of the project, and the form of planning and implementation (Bridge, 2004; Cuba et al., 2014; Jacka, 2018). In a review of scholarship exploring links between the environment, mining and development, Bridge (2004) offered an invaluable overview of the historical conceptualizations of environmental impacts of mines. The author explained that for centuries, environmental concerns around mining centered on whether the environment could provide sufficient resources to maintain the economy. Such conceptualizations mirrored Malthusian concerns about the environment's capacity to sustain the human population within demographic and socioenvironmental discourse (Lee, 2003). It was in the late 1900s that environmental concerns associated with the physical impacts of mining began to emerge. Such concerns focused on the physical landscape change (deforestation, landscape change, open-pits) and pollution – both physical (particulates released into the air, land and water) and chemical (used in processing and refining such as mercury, arsenic, cyanide and solid wastes) (Bridge, 2004; Jacka, 2018). In reference to physical pollution, Bridge (2004, p. 2010) explained;

> *The salient characteristic of metal mining, however, is that mineral processing is a segregative process by which a relatively small amount of a valued substance is isolated from a much larger mass of less valuable material. Segregating the valued component occurs through a series of steps, each producing a separate waste stream.*

For example, the process of gold extraction produces 3138 Million Metric Tons (MMT) of material, of which only 0.002 MMT is the gold mineral itself (Bridge, 2004). Therefore, nearly all of the mineral material produced in gold extraction must be discarded as waste. Ratios of mineral-to-waste in the extraction of other materials commonly mined in Peru, such as copper and zinc, are comparable to gold, suggesting the need for huge sums of waste product to be disposed of.

Chemical contamination from mining can also be substantial, occurring through two primary routes: release into the environment in the processing of minerals, or through the process of oxidation as minerals are exposed to the air and water – known as acid mine drainage (Bridge, 2004; Jacka, 2018). In large-scale operations, concentrations of such acid drainage may be released into waterways, causing generational health and environmental impacts (Jacka, 2018). In addition, the transport of toxic chemicals and mining products may pose a risk to communities. For example, in Peru, one of the largest world-wide spills of mercury occurred in 2000 in the transport of mercury from a large-scale mining facility in the Northern Andes (Arana-zegarra, 2009). The accident covered 40 kilometers of land, exposing a rural community to 151 kilograms of the toxic chemical, affecting the health and well-being of families and children for years to come (Arana-zegarra, 2009; Isla, 2014).

Attention to the ecosystem and community health risks and harms associated with large-scale mining have garnered attention since the 1990s, leading governments, corporations, and interest groups to integrate environmental planning, corporate social responsibility (CSR) practices, and impact assessments into large-scale mining development planning (Bridge, 2004; Li, 2009a). However, the pace of large-scale mining concessions and development in Peru threatens ecosystem health and the viability of other industries, including agriculture (Cuba et al.,

2014). Overlaying maps of mining concessions, agricultural land use, water basins and conservation lands, Cuba et al. (2014) revealed that mining concessions are infringing on 38% of the total land used for agriculture in Peru. In addition, the authors noted the increasing encroachment of mining concessions on water basins, which have historically been allocated to agricultural needs. Given the high demand for water in large-scale mines for refining and mineral processing, these findings suggest a potential future in which mining will have a profound impact on the nation's water resources. In the context of proliferating mining development in Peru, attention to environmental impacts continues to be paramount.

Gendered impacts of mining

> *"…… mining has been shown not to be gender neutral, but to impact disproportionately upon women, particularly poor and rural women."* (Jenkins, 2015, p. 445)

A growing body of scholarship unpacks the ways in which community- and household-level social and economic impacts of mining exacerbate gender inequalities (Oxfam, 2017). For example, the mining sector is a male-dominated work environment that often excludes or discourages women's involvement (Segerstedt & Abrahamsson, 2019). Worldwide, the mining sector has traditionally employed far more men than women. The World Bank reports that only 10% or less of positions in most extractive industries are occupied by women (Eftimie et al., 2009). In addition, when mining projects begin, labor markets in neighboring communities may shift, favoring employment for men and reducing wage-earning opportunities for women (Park et al., 2019). Additionally, the wage gap between men and women has been shown to increase in mining regions (Segerstedt & Abrahamsson, 2019). In a review of gender scholarship around mining, Segerstedt and Abrahamsson (2019) found that in the Global North, gender income disparities increase as mining employment increases in a region. These authors pointed to

literature around "mining masculinity" (Segerstedt & Abrahamsson, 2019, p. 617), associated with hard manual labor, bravery, and machismo, that predominates in the mining sector, creating an exclusionary environment for women. In fact, reports of sexual harassment and abuse are common in male-dominated mining camps and work places, and myths about minerals hiding or mines collapsing if women enter are still prevalent in many contexts (Au Yong Lyn, 2021; Eftimie et al., 2009).

On the other hand, mines can open up new labor-market opporutnities for young men and women, though the nature of such employment is often more precarious and transient. For example, in Peru, a nationally prolific mining sector creates labor market opportunities for youth that require residence and work far from families in remote communities for extended periods of time (Bebbington & Humphreys Bebbington, 2018; Segerstedt & Abrahamsson, 2019). In Chad, Leonard (2016) assessed the impacts of oil development on men and masculinity, finding that young men who found employment in the oil sector often had temporary, dangerous and labor intensive work. These men performed masculinity by providing for their families, sending their kids to school and investing in cattle. In other words, employment in the industry allowed men to fulfill what were perceived to be traditional masculine roles of providing for their families. However, given the temporary labor needs of the oil industry, these men were often left feeling demoralized when their employment ended (Leonard, 2016). The nature of highly transient, labor-intensive employment in the mining industry may further preclude women's involvement, excluding women with childcare or household responsibilities, or who are pregnant and cannot travel for extended periods or perform exhaustive physical labor (Oxfam, 2017). However, among women employed by mines, employers have noted marked improvements in efficiency. Evidence from mining companies around the world reveals improved efficiency and lower

operating costs when heavy machinery is operated by women (Eftimie et al., 2009). Finally, influxes of young men for mining work has been associated with increases in prostitution and sex work (Aalhus, Oke, & Fumerton, 2018; Ward & Strongman, 2010; Wilson, 2012). While often vilified, Mahy (2011) proposed an alternative conceptualization of migrant sex work as a livelihood strategy for some women. However, the implications of increased sex work among women – a valid and legal livelihood strategy in Peru – is that the broader political economy constrains women's employment opportunities within the predominant economic sector.

With changing labor markets and opportunities associated with mining development, household and community power dynamics can shift, often in ways that reduce or restrict women's negotiating power and/or increase unpaid care responsibilities (Ferrant, Pesando, & Nowacka, 2014; Oxfam International, 2017). In fact, woman have historically been excluded from decision-making spaces around the impacts of mines (Li, 2009b). For example, in a study of a large-scale gold mine in Northern Peru, Li (2009) documented how new roads constructed to better access the mine facilitated rural women's access to the capital city to sell their products, but that women were excluded from participating in town assemblies addressing the mine, effectively excluding their voices and influence from planning processes. On the other hand, in Mexico, in states with gold mining booms in the early- and mid-2000s, women had enhanced intra-household decision-making power (Au Yong Lyn, 2021). However, the author identified a significant increase in domestic violence in gold producing regions, reflecting findings from around the globe (Au Yong Lyn, 2021). In fact, the influx of young men and associated labor-market and household livelihood shifts has been linked to a consistent pattern of increased gender-based violence within extractive industries and the communities they impact (Aalhus et

al., 2018; Au Yong Lyn, 2021; Castillo & Brereton, 2018a; Hoogeveen, Williams, Hussey, Western, & Gislason, 2021).

Finally, mounting evidence suggests negative health consequences are associated with mining in ways that are gendered (Arana-zegarra, 2009; Fernández-Navarro, García-Pérez, Ramis, Boldo, & López-Abente, 2012; Rzymski et al., 2015). The process of extracting minerals is associated with mineral pollution in the form of mercury, arsenic, cyanide and other chemical pollutants that may expose individuals to toxins linked to cancer, reproductive health issues, and respiratory issues (Arana-zegarra, 2009; Bridge, 2004; Fernández-Navarro, García-Pérez, Ramis, Boldo, & López-Abente, 2012; Rzymski et al., 2015). Exposure to such toxins may be related to one's occupation within a mine itself, or living in proximity to a mine (Fernandez-Navarro et al., 2012). For example, in a review of the health impacts of heavy metals, Rzymski et al. (2015) found that mercury contamination in animals has been linked to reproductive abnormalities, and among humans, with menstrual changes and lower birth weights, suggesting exposure to these mining chemicals disproportionately impact women and children. On the other hand, working in a mine has long been associated with negative health outcomes. Fernandez-Navarro et al. (2012) found that mortality related to certain cancers (colorectal, lung, bladder and leukemia) were all significantly higher among men and women in mining regions of Spain. Certain cancers were higher among men (colorectal, gallbladder, bladder) living in proximity to mining projects (Fernandez-Navarro et al., 2012). In light of these findings and given that men are more likely to be employed by mining projects, men may assume disproportionate occupational health risks in mining-affected areas.

The well-documented gendered impacts of mining suggest that young men and women growing up in mining communities face challenges to social and economic well-being as they

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enter adulthood. Evidence suggests that young women face limited employment opportunities in the mining sector, increased gender-based violence, shifting gender norms and expectations and exposure to health risks associated with mining contamination. Young men also experience shifting gender norms and expectations in which they are expected to accept labor-market opportunities are increasingly mobile, transient, dangerous and labor-intensive. To date, scholarship addressing gendered youth experiences, outcomes and ambitions in the context of large-scale mining development in the Global South is limited, a research gap that this project seeks to address.

Impacts for youth

A large body of work from sociology, geography, demography and economics evaluates the social and economic outcomes linked to large-scale mining projects, yet assessments of the effects for youth are limited. Existing studies of mining and extraction focus predominantly on the implications for children, particularly educational and health outcomes. However, youth transitions to adulthood – completing school, entering the labor force, and making decisions about their futures – are vulnerable to existing socioeconomic conditions (Gauthier, 2007; Grant & Furstenberg Jr., 2007). Fertility, migration and family formation outcomes – which have profound impacts on youth well-being – are notably absent in analyses of mining impacts in the Global South. Additionally, little is known about how youth themselves experience growing up in mining communities or how proximity to large-scale mines shapes youth labor and higher-education decisions and aspirations at key transition periods from high school.

A handful of studies have explored the relationship between infrastructure, employment, and child or youth well-being. Jensen, Yang, and Muñoz (2012) evaluated the relationship between natural resource dependence and child outcomes in school attendance and youth employment in

Chile. Overall, Jensen et al (2012) found reduced school attendance for children with parents in any natural resource dependent industry. However, they found positive effects for children's school attendance for those with parents employed by mines when compared to parents involved in forestry, agriculture and fishing. In a study of rural livelihoods using the sustainable livelihoods approach, Hinojosa (2013) documented the ways in which large-scale mining impacts communities in Peru's Southern highlands. The author found that schooling for children increased within communities affected by mines, primarily by way of migration to urban centers with enhanced educational opportunities. The increased access to schooling through migration led the author to presume a benefit to younger generations. The underlying assumption in this work is that children's access to education and the shift away from farm-based subsistence is ultimately beneficial for children's futures due to associated human and social capital accumulation. However, such assumptions overlook existing political and economic contexts in which young adults often face limited employment opportunities, and deny other indicators of well-being and development (Ames & Rojas, 2009; Ansell, 2016).

In a rare study focusing on youth within a mining context, Maconachie (2014) used qualitative methods in Sierra Leone to explore youth responses to mining activity and how their responses shape corporate activity. In this context, as natural resources became increasingly difficult to extract through artisanal means, larger corporations with more advanced extraction technologies replaced artisanal mining – a form of employment for many young people in the region. In light of rising youth unemployment attributable to the decline of artisanal mining and agriculture, corporations made efforts to appease young people, for example by funding soccer teams and job training programs. Appeasing youth was seen as an important strategy to continue work in the region, as youth unrest was attributed to past violent wars in the region. By way of

interviews, focus groups, and structured observations, the author found that youth employed by the industrial mines had mixed feelings of happiness at being employed, but also discontentment about the poor working conditions and pay. Youth-led organizations pushed for better working conditions and community engagement, but had not advocated for the mine to leave the region (Maconachie, 2014). This study offers important insight into the dynamics between industrial mining and youth in Sierra Leone. Building on this work, the present study draws attention to broader youth outcomes and youth well-being in addition to employment and educational opportunities.

Community change associated with mining has implications for youth demographics, but limited attention has focused on the demographic implications of mining projects for youth in the Global South. Large-scale mining developments often generate influxes of temporary and long-term laborers, both professional and low-skilled, reshaping physical spaces and social relations (Bebbington & Humphreys Bebbington, 2018; Castillo & Brereton, 2018a). For youth, large-scale mining projects may be associated with labor opportunities that require temporary or long-term migration from their home communities (Bury, 2005; Vincent, 2000). The influx of mine laborers is associated with changing sexual behaviors in affected communities, either by reducing risky sexual behaviors (Wilson, 2012) or increased sexual promiscuity and associated increases in cases of HIV/AIDS in some regions (Bridge, 2004). A better understanding of the implications in mining contexts for youth migration and fertility decisions at key transitions to adulthood are paramount to inform policies and programming oriented toward youth well-being.

The demographic shifts associated with mining in Peru have predominantly focused on migration, much of which is done by youth. For example, Vincent (2000) explored the development of a copper company and railroad that affected one rural community in the central

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Peruvian Andes. Vincent demonstrated that seasonal, migratory labor with these two industries re-shaped family life, specifically by removing the family expectation that younger generations would ultimately take over the family farm. In Vincent's view, migration for wage labor disrupts this norm because migrants are more likely to enroll their children in better schools away from their rural communities, reducing opportunities to learn how to tend the land. Similarly, Bury (2005) examined livelihood strategies involving migration and labor of families in the northern Peruvian province of Cajamarca, impacted since the 1990s by large-scale mining activity (Bury, 2005). In Bury's analysis, migration was one livelihood diversification strategy employed by rural families whose land was impacted or appropriated by large-scale mining activity. In another example, Steel (2013) examined how mining and tourism promote rapid population growth and increasing social stratification in cities and towns neighboring such developments. While Bury (2005), Steel (2013) and Vincent (2000) did not explicitly focus on youth well-being, inferences can be made about how the larger changes in livelihood strategies and social stratification influence young people in these areas. These studies point to the interconnections between development, environment, and youth well-being in that migration for wage labor becomes normalized and agricultural livelihood strategies are viewed as less desirable outcomes.

Research Context

Peru is a large country in South America, made up of 24 departments and 196 provinces which are sub-divided into districts. A rich and diverse country ecologically, the country is often described as having three ecological zones; the Andean mountain region, the coast, and the jungle (Oliver-Smith & Hoffman, 1999). Such regional categorizations simplify Peru's unique and nuanced geographical and social complexities, but offer a conceptual categorization that broadly corresponds with unique sociocultural histories and geographical variation that have

historically made for unique policy challenges (Oliver-Smith & Hoffman, 1999; Zimmerer & Bell, 2013). In fact, social and demographic research in the country has traditionally been disaggregated by ecological region, rural or urban status, and/or by department (Galvarez, 2013; White et al., 1995). Peru embodies social, political and demographic shifts apparent in the Latin American region in recent decades (Bury, 2005; Li, 2009a; North & Grinspun, 2016; Ponce & Mcclintock, 2014). Currently considered an upper-middle income country, Peru has experienced steady economic growth over the past two decades, much of which is built on the export of minerals and agricultural products (Bury, 2005; INEI, 2020b). In 2019, extracted minerals made up nearly 60% of the nation's exports, and have made up an average of 20% of Peru's annual GDP since the 1990s (INEI, 2020). In addition to steady economic growth, Peru has experienced rapid urbanization and declining fertility rates (Guzman et al., 1996; INEI, 2017; The World Bank, 2007). Mirroring neighboring countries in the region, 79% of the Peruvian population resided in urban areas according to the 2017 census, mostly along the coast, and nearly a third lived in the capital city, Lima (INEI, 2017; Talleri, Llinas-Audet, & Escardíbul, 2013).

Political and economic context

Since the 1990s, Peru's national government has increasingly opened its doors to international investment in mining exploration and development, with the number of mining exploration permits and contracts climbing steadily each year (Sullivan, 2014). Prior to this open-door policy approach to foreign investment, Peru had tumultuous decades of economic shifts. In the 1970s, A military government led by General Velasco aimed to end Peru's dependency on foreign investment, nationalizing key industries – including mines – and coordinating mass land-tenure reform (known as the Agrarian Reform) and social programs (Baillie et al., 2020; Bury, 2005; Hudson, 1993). The national project did not succeed, partly due

to ballooning debt, limited governmental accountability, and overburdening those charged with implementing the policies on local levels (Hudson, 1993). In 1980, the country returned to democratically elected government, re-electing the formally ousted president Belaunde, who favored export-based economic policies at "a time when the world recession caused the prices of Peru's major export products to plummet" (Hudson, 1993, p. 242). Belaunde's predecessor, Alan Garcia, strived to rebound the economy through decentralization and investing in agricultural developments (Hudson, 1993). However, the decade was primarily characterized by economic instability, international price shocks, climate disasters, a rise in terrorist activity (the Shining Path) and international pressure to adopt structural adjustment policies common in the region at the time (Bury, 2005; Cardoso & Faletto, 1979; Hudson, 1993; McMichael, 2017).

In the 1990s, Alberto Fujimori was elected to power, adopting neoliberal policies and practices that were designed to help Peru better integrate into the global economy (Bury, 2005; Hudson, 1993; Ponce & Mcclintock, 2014). A number of significant reforms under Fujimori have shaped the trajectory of mining investment in the country to date. First, to incite private multinational investment, generous tax packages were offered to mining firms, such as not paying royalties to the Peruvian government, nor paying taxes on profits until a return on investment is realized (Ponce & Mcclintock, 2014; Sullivan, 2014). Under Fujimori, indigenous lands previously protected from sale were allowed to be sold if 50% or more of the community agreed (Ponce & Mcclintock, 2014). In 1995 a new Land Law was passed, providing corporations unrestricted use of lands that they purchased from landowners, followed by the National Mining Cadastre Law in 1996, which facilitated mining concessions and aimed to limit and quickly address land disputes (Bury, 2005; Ponce & Mcclintock, 2014). Indeed, under Peruvian law, landowners only legally own the surface of land. All subterranean material is

owned by the state. Therefore, mining companies have been able to threaten and intimidate landowners into selling their land for lower rates due to fears that lands would be taken over by the state (Ponce & Mcclintock, 2014; Sosa & Zwarteveen, 2012; Sullivan, 2014).

In the final decade of the 20th century, Latin America received the largest share of global mining development investment world-wide (Bridge, 2004). In Peru, the result of neoliberal policies of the 1990s was an explosion of mining investment, development, and production in the country. Investments in mining "increased from $200 million in 1993 to $1.5 billion in 2000" (Ponce & Mcclintock, 2014, p. 121). Mining accounted for 45% of exports between 1990 and 2000, and mining's contribution to Peru's GDP grew 29% per year between 2000 and 2006 (Bury, 2005; Zegarra Eduardo, Orihuela, Jose, Paredes, 2007). In the early 1990s, Peru was the world's third largest producer of silver, and the region's largest producer of zinc (Gurmendi, 1994). By 2000, Peru became the world's leader in gold production, second in copper, third in zinc, fourth in lead and fifth in silver (Gurmendi & Szczesniak, 2000). By 2007, Peru led the world in production of a handful of minerals, including gold, silver, zinc, lead and tin. More recently, Peru's economy continues to grow, primarily driven by mining and hydrocarbon sectors, and Peru remains the second-largest producer of silver, copper and zinc (Soto-Viruet, 2022). According to the U.S. Geological survey, mining activity (not exclusively large-scale mining activity) in 2017 was distributed across the country – in 24 of the country's 25 departments (Soto-Viruet, 2022). Using data from the Peruvian Ministry of Energy and Mines, Figure 3.1 displays the location of large-scale mining activity in the country, overlaying provincial boundaries (equivalent of U.S. counties) (MINEM, 2021). Large-scale mining activity extends along Peru's central Andean region and the coast, and is concentrated in the North-West,

Central-West and Southern cone of Peru. Areas without large-scale mining activity are in the country's jungle region, areas were artisanal and small-scale mining activity are more prevalent.

Figure 3.1: Licensed large-scale mining activity in Peru 1956-2020, provincial boundaries

Social context

While mining for minerals has proliferated in the recent decades in Peru, the country has a long history of mining and exploitation. Dell (2010) explored the history of the mining *mitas* in Peru, referring to forced mine labor in which the Spanish conquistadores required the adult male indigenous populations neighboring silver and mercury mines to work without pay. Dell found colonial-era *mita* communities to have persistent inequalities compared to non-*mita* communities, including less dense road networks and a higher proportion of the population reliant on subsistence agriculture. The author explained that such inequalities persist due to land tenure rights that were determined in colonial times, leaving a legacy of land use and access

rights (Dell, 2010). From a political economic perspective, this long legacy of mining demonstrates how inequities are built into extractive industries, forever changing and re-shaping the local ecologies, economies and social systems.

The legacy of inequality perpetuated by mining persists in Peru, where high levels of mineral exports and GDP growth have paralleled high levels of socioeconomic inequality that riddles Latin America (North & Grinspun, 2016). Despite investments in education and the social sector, the benefits of economic growth have not been shared evenly. Thirty percent of the Peruvian population lived below the national poverty line in 2020, an increase of 10% from the previous year, likely partially attributable to the global Covid-19 pandemic (INEI, 2020). In addition, fully 46% of rural Peruvians were in poverty in 2020, and 14% suffered extreme poverty compared to 26% and 3% respectively for those residing in urban areas, as measured by the Peruvian National Statistics Institute (INEI) (INEI, 2020b). In addition, stark, pervasive, and persistent inequalities amidst increasing investments in large-scale development projects have led to increasing discontent, protests, and conflict (Riggirozzi, 2012). Weakened peasant land tenure rights, land acquisition, and associated livelihood transitions have increasingly resulted in social and community conflict related to mining (Bebbington, Humphreys Bebbington, et al., 2008; Damonte & Vila, 2014; Paredes, 2019). In Peru, socioenvironmental conflicts increased five-fold between 2004 and 2012, and have continued to be a persistent source of social and environmental conflict (Damonte & Vila, 2014; Paredes, 2019).

Social conflict associated with mining has been studied extensively (Bebbington, Abramovay, et al., 2008a; Milan & Ho, 2014; Paredes, 2019; Wright & Samaniego, 2008). One of the underlying sources of discontent is the mismatched scale of economic benefit and environmental harm; the national government reaps profits reflected in GDP growth, while local

communities bear the brunt of social and environmental impacts (Baillie et al., 2020; Ponce &

Mcclintock, 2014). In fact, Bury (2005) noted that the mining sector only accounted for 0.4% of

employment in Peru in 2000, countering the commonly held belief that mining would result in

employment opportunities. To correct for such imbalances, the Cannon Tax law was passed in

Peru in 2001 under the Toledo government, requiring 50% of taxes from mining be re-distributed

to affected communities through their local governments (Gajate-Garrido, 2014; Ponce &

Mcclintock, 2014). Evidence of successful local community development alongside natural

resource development in the U.S. reveals the importance of taxing and re-investing natural

resource extraction revenue, when and if the investments are targeted toward diversifying local

economies and maintaining strong and consistent environmental regulation compliance (Kinchy

et al., 2014; Tallichet, 2014). The Cannon funds, however, are required to be spent on

infrastructure or capacity building (primarily through research and technical training in

universities). Many municipalities have struggled to use the influx of funds efficiently, and

inequality in terms of who receives the Cannon funds plagues the system (Ponce & Mcclintock,

2014). For example, one study revealed how tax revenue received from the Cannon has not

translated into better health outcomes for children in rural areas impacted by mines (Gajate-

Garrido, 2013). With regard to environmental concerns, Environmental Impact Assessments

(EIAs) have been required of mining developments since the 1990s (Li, 2009). However, EIAs

were long overseen by the Peruvian Ministry of Energy and Mines, who were also charged with

incentivizing mining development in the country (Li, 2009). EIA oversight was only relegated to

the Peruvian Ministry of the Environment with its creation in 2008, and the Ministry has been

plagued with funding and personnel shortages (Damonte & Vila, 2014).

Peru's lengthy history of extraction as an economic engine continues today, raising concerns about how such development will impact local communities and future generations. Disorganized allocation and mismanagement of Cannon funds coupled with opportunities for corrupt and expedited environmental reviews have lasting implications for communities impacted by large-scale mining developments. Making up nearly 30% of the nation's population, the social, environmental and economic impacts of mining at local, regional and national scales have implications for youth employment prospects, health and well-being (OECD, 2017).

Youth well-being in Peru

In Latin America, Wolseth and Babb (2008) describe the ways in which youth have (re)defined cultural norms and pushed forward political movements. The authors point out that in the context of national and regional economic growth, many young people – particularly from rural areas – lack both education and employment opportunities in an increasingly globalized market. Indeed, Cárdenas, De Hoyos and Székely (2015) found that nearly 20% of Latin America's youth were both out-of-school and out-of-work, outcomes further stratified by gender and class, with poor young women being more likely to be out-of-work and out-of-school. Research in Latin America and Peru indicates that families place high value on education and may employ scarce resources to provide quality education for their children (Ames & Rojas, 2009). However, this effort does not necessarily result in fruitful employment and may instead lead to "a glut of partially educated young men and women living in rural areas without job prospects" (Krauskopt, 1998 in Wolseth & Babb, 2008). Children and youth in Latin America, therefore, find themselves in a labor market that demands higher levels of education for fewer available jobs. This situation perpetuates longstanding inequalities between those with more and less resources and between rural and urban places.

Youth employment

The reality for Peruvian youth mirrors issues from around the region. Currently experiencing what demographers refer to as the demographic dividend, Peru is in a key historical moment to benefit from a large working-age population (Bloom, Canning, & Sevilla, 2003; OECD, 2017). According to INEI (2021), youth made up 28% of the population in 2000, and 24% in 2020. Mirroring regional trends, nearly 15% of youth in Peru are both unemployed and not currently studying (OECD, 2017). Given growing educational attainment in the country, youth face the same issue plaguing the region, with many either underemployed or overqualified for the positions they occupy (OECD, 2017). In addition, working conditions are precarious for many young people, particularly those from rural areas, young women, and those living in poverty. Youth face employment opportunities that are temporary, unstable, and often in the informal sector, augmenting the precarity of working conditions. In fact, Peru has the highest rate of informality in the region; 82% of Peruvian youth are employed in the informal sector. For rural youth, the number is even more striking – nearly 100% of youth from rural areas were employed in the informal sector in 2017, according to the OECD (2017). Many young people aspire to transition from informal work to more permanent and stable positions, a reality only reflected in 20% of young men and 17% of young women (OECD, 2017).

Youth education

In Peru, students typically finish secondary studies by the age of 16 and, particularly in rural areas, are faced with difficult decisions about their lives and livelihoods. While rates of secondary school desertion have dropped dramatically since the 1990s, higher education remains difficult to obtain for the lower income groups, young women, and youth from indigenous

communities (OECD, 2017). Despite evidence of increasingly low returns on education for many young people in Peru, education is viewed with reverence for many as a pathway out of poverty (Leinaweaver, 2008). Leinaweaver (2008) revealed how the powerful sentiment of "bettering oneself" (*superarse* in Spanish) promotes a cycle of child migration. Leinaweaver detailed how families send children to cities with relatives to pursue a better education, fragmenting families and often resulting in children (particularly girls) conducting household labor for the host family. For young women, in addition to escaping conditions of poverty, education may be seen as a way to escape "oppressive gender relations" (Ames, 2013). However, Ames (2009) found that young women from rural communities often dropped out of higher educational settings, citing discrimination among other challenges.

Family decision-making about education may by gendered in terms of who receives an education and who does not. Ames and Rojas (2009) found that in rural areas, resources for education may be primarily allotted to young boys. However, in contexts where men often migrate away from their communities, resources may instead be directed to young women, "with the expectation that they will stay in-country and provide subsistence-level incomes" (Wolseth & Babb, 2008, p. 5). Indeed, Leinaweaver (2008) found that young girls are sent to stay with extended family networks for education more often than boys. However, in this case, girls were easier to place in extended familiar homes given their perceived domestic utility in the household. Research around youth and education in Peru indicates how gender, class and rurality all influence youth opportunity, outcomes and well-being. Indeed, women's enrollment in higher education has been increasing since the 1980s, currently outpacing men's enrollment (Guerrero & Rojas, 2020). However, their experiences and ultimate outcomes in higher education are shaped by intersecting identities of rurality and indigeneity. Guerrero and Rojas (2020) found

that rural girls typically had to work to support their higher educational pursuits while girls from urban areas did not. In addition, all girls faced strong gendered norms about what they should/could study and their continual caregiving responsibilities in the household, limitations that their male counterparts did not experience (Guerrero & Rojas, 2020). In sum, education for youth is still considered a key milestone for most to achieving employment and long-term well-being, but attainment and completion continues to be hindered by socioeconomic status, gender, ethnicity and geography.

Youth demographics

Youth transitions to adulthood are often associated with first romantic unions and childbearing (Juárez & Gayet, 2014). Early childbearing among youth has long-term, lasting impacts on overall well-being, particularly for young women. For example, research indicates that becoming pregnant and giving birth as an adolescent can have lasting impacts for parents in the form of educational and economic opportunity, as well as health and educational impacts on the children of adolescent parents (Levine, Emery, & Pollack, 2007; Urdinola & Ospino, 2015). Some evidence suggests that adolescents in Brazil and Bolivia with limited social and economic opportunities may see family formation and having children as desirable in order to establish their role in communities (Azevedo et al., 2012). In Peru, despite nationwide educational gains in the country often associated with delayed childbearing, the percent of adolescent first births and women under 18 years old forming a union has been increasing (Esteve & Florez-Paredes, 2018a; Neal, Harvey, Chandra-Mouli, Caffe, & Camacho, 2018; OECD, 2017). Adolescent motherhood and associated domestic responsibilities are reflected in young women's employment and educational outcomes, as young women who are parents tend to have lower

educational attainment, lower paying employment, or are currently unemployed and not studying (OECD, 2017).

In addition to fertility decisions, migration is also viewed as a pathway to better economic and educational opportunities. Most existing theories explaining the drivers of migration point to labor as the underlying mechanism of migration (Crivello, 2015b; Massey, 1999). In the Latin American context, internal migration has been historically difficult to estimate, but studies suggest it is driven by younger populations (Baez, Caruso, Mueller, & Niu, 2017; Rodríguez-Vignoli & Rowe, 2018). In a study of youth migration in Mexico, Baez et al. (2017) assessed the likelihood of migration among young people ages 15-35 in response to drought and hurricanes. The authors hypothesized that youth were more likely to migrate for labor opportunities in post-disaster scenarios, but did not explicitly test this hypothesis. Instead, the authors found that young migrants were likely to migrate short distances (from rural to other rural areas, or from rural areas to small provincial towns) and were more likely to have at least a primary-level education. In another study Rodríguez-Vignoli & Rowe (2018) attempted to calculate and decompose rates of internal migration in eight Latin American cities. These authors found that rural-to-urban migration from the 1930s to the 1970s in the region was driven primarily by younger people, women, and those with less education. From the 1990s onwards, the authors identified patterns in which the more highly educated and young men drove internal migration, a shift associated with national investments and developments in agriculture and mining (Rodríguez-Vignoli & Rowe, 2018).

In Peru, most studies exploring youth migration employ qualitative methodologies, assessing migration within a framework of youth aspirations (Crivello, 2011, 2015; Leinaweaver, 2008). Migration among youth is often viewed as a pathway to better economic and educational

opportunities (Crivello, 2011; Leinaweaver, 2008). Youth in Peru often face enormous familial pressure to pursue higher education, which is understood as a pathway out of poverty (Crivello, 2011, 2015). As such, migration is often seen as a warranted and necessary step to reach higher education and employment goals, as many of the country's higher education institutions and employment opportunities are in urban centers (Crivello, 2011). In a unique longitudinal study of Peruvian youth, Crivello demonstratesd the ways in which migration among youth and children in Peru has a long tradition, particularly for those form the Andean region (Crivello, 2015). Drawing from interview data and historical biographies, the author revealed the way migration decisions are relational: embedded in family ties and networks, socioeconomic context, and histories of violence. Importantly, the author identified long parental absences for many children in their study, associated with employment opportunities far from home communities. In one example offered by the author, a father's employment in a mine led to his extended absence and eventually recruiting his son to work with him at the mine as well (Crivello, 2015). The experiences of Peruvian children and youth outlined by Crivello (2015) contextualize both the prevalence and relational aspect of youth migration.

Chapter synthesis

Large scale mining developmental projects have been shown to have deep and lasting social, economic, environmental and demographic impacts on surrounding communities and households. The experiences and outcomes of youth in such contexts offer a lens through which to better understand the impacts and future implications of large-scale mining development projects. The body of existing scholarship reviewed in this chapter uncover a pattern of national-level economic growth associated with extractive industries, but suggests such growth is

unevenly distributed (Davis & Vásquez Cordano, 2013; Fleming et al., 2015; Gamu et al., 2015). Indeed, existing scholarship finds industrial/large-scale mining does not alleviate poverty and inequality, despite national economic growth (Apergis & Katsaiti, 2018). Intranational studies of regional differences as to the impacts of mining reveal localized economic benefit in terms of incomes and jobs, but also increasingly precarious working conditions, social stratification, and unequal opportunity across axes of gender and rurality (Santos, 2018; Tallichet, 2014; Zabsonré, Agbo, & Somé, 2018). Additionally, large-scale mining is associated with environmental degradation, increasing gender-based violence, gendered labor-market opportunity, and localized demographic behavioral shifts (Bridge, 2004; Castillo & Brereton, 2018a; Eftimie et al., 2009; Segerstedt & Abrahamsson, 2019; Steel, 2013). In sum, the political economy of mining maintains a narrative as to the economic benefit of mining despite all other limitations and drawbacks, a development strategy aligned with global capitalism.

The implications of large-scale mining development for youth outcomes has garnered limited attention in the existing literature. Scholarship has predominantly focused on educational outcomes for children (Hinojosa 2013; Jensen et al., 2012; Santos, 2018), shift in sexual behaviors (Wilson, 2012), and the relationship between the mining industry and youth in one specific context (Maconachi, 2014). In a country that has fostered the proliferation of large-scale mining development, understanding the implications of such a strategy for youth outcomes is paramount. As the largest demographic group, youth represent Peru's social, political and economic future. If large-scale mining development undermines youth well-being, the future of the nation will likely be unstable. Alternatively, large-scale mining developments may generate opportunities and foster positive well-being among Peruvian youth. This research project aims to uncover the implications of such a development strategy for youth well-being. Further, given the

unequal distribution of mining benefits found in prior work, I seek to disentangle youth outcomes associated with large-scale mining across axes of geography and gender. In the subsequent chapter, I describe the research methodology and data sources utilized for this research project.

Chapter 4 – Methodology

I utilize several empirical strategies in this dissertation to address different research questions, drawing from three unique data sets. Below, I describe each source of data and how it was collected or obtained. Next, I describe the analytical strategy applied to for each research question.

Dataset 1: Secondary census sample data & geographic mining data

For this project, secondary data are drawn from two sources and merged to create a unique, geographically referenced dataset with which to assess the impact of large-scale mining on youth outcomes. First, I obtained census microdata from Peru at two time points (1993 and 2007) from the IPUMS-International database (Minnesota Population Center, 2020). IPUMS-International is a publicly available database maintained by the Minnesota Population Center that collects, synthesizes and harmonizes census microdata from around the world. The Peruvian census microdata are provided by the Peruvian National Institute of Statistics and Informatics – *Instituto National de Estadistica e Informatica* in Spanish (INEI, 2020b). While the most recent census in Peru was collected in 2017, microdata are not available through IPUMS-International at the time of this analysis, and only aggregated data were available through INEI. However, given the proliferation of large-scale mining that occurred in the early 1990s, the 1993-2007 time period is appropriate to assess the impacts of large-scale mining on youth outcomes (Ponce & Mcclintock, 2014; Sullivan, 2014). For the purpose of this project, I restrict analysis to youth ages 15-29, consistent with the Peruvian governmental definition of 'youth' (OECD, 2017). The IPUMS census microdata includes individual-level information such as age, sex, migration status, marital status, education level and current employment status, as well as access to cell phones, telephones and internet. In addition, the sample includes a range of contextual

information about whether individuals live in rural or urban areas, and have access to running water, sewage, bathrooms, electricity and internet.

In order to analyze whether youth outcomes vary by exposure to mines, geographically referenced mining data were accessed and downloaded through the Peruvian Ministry of Energy and Mines at https://geocatmin.ingemmet.gob.pe/geocatmin/ in February of 2021. These data provided the size of the mine in hectares, the years in which government approvals were obtained, the current status of the mine (titled, blocked, in process of obtaining approval, or terminated), latitude and longitude of the mine, and the department, province and district in which the mine is/was located. I restricted the sample to titled projects and those that were 2,000 hectares or more, the official Peruvian government's definition of large mining projects (MINEM, 2021). I manually assigned the provincial-level codes used in the IPUMS-International sample in order to merge mining information with census data by province. IPUMS-International combines provinces if census boundaries change between census years in order to create harmonized spatial categories over time. This harmonization results in 168 provinces in the IPUMS-International categorization, 26 fewer provinces than are officially demarcated by the Peruvian government. Two mines located off the coast of Peru with no assigned province were excluded from the analysis. To ascertain the year in which the mining project was considered active, I used the resolution date associated with the mining project's approval and cross-referenced with the year in which mines were given Environmental Impact Assessment (EIA) approval (Li, 2009). EIAs have been required for all mining projects since the early 1990s and correspond with a license to begin land preparation, construction and extraction (Li, 2009). EIAs were identified using the Ministry of Environment's records for each large-scale, titled mining project (MINAM, 2022). Therefore, EIA date are particularly useful for

identifying the year in which large-scale mining projects were given official governmental approval to conduct all mining-related activities in the 1993-2007 timeframe.

Dataset 2: Independently collected survey data

To evaluate whether youth aspirations and outcomes vary by whether or not they are exposed to large-scale mining projects, an electronic survey instrument was coded into Qualtrics software as part of an explanatory sequential mixed methods design (Creswell & Plano Clark, 2007). To enhance validity and reliability of the survey, I built on existing research, and worked with native Spanish speakers, Peruvian researchers, and my doctoral advisors to develop appropriate questions (Pokorny et al., 2019). The survey instrument, in conjunction with secondary data analysis and subsequent semi-structured interviews was designed to triangulate results (Bryman, 2006).

The survey instrument targeted youth between the ages of 18 and 30 and was approved by Penn State's Institutional Review Board in January 2021 (STUDY00016856). A pilot version of the survey was sent to ten youth organizations between August, 28th, 2020 and September 20th, 2021. The pilot survey was reviewed to assess any survey glitches, unclear question wording or unnecessary questions (e.g. questions that were consistently skipped), and to add additional questions (Singleton & Straits, 2010). Unable to obtain a sampling frame of all Peruvian youth, a nonprobability sampling approach was employed to recruit survey respondents (Baker et al., 2013; Dillman, Smith, & Christian, 2014). Specifically, a network-driven data collection strategy was employed by sending a link to the survey with a description of the research project to registered youth organizations through the local and national government. Such sources included the National Registry of Youth Organizations (SENAJU, 2021) the Metropolitan Network of Youth Organizations (http://redmetro.gpvlima.com/public/), and

departmental and provincial-level registries of youth organizations maintained by local municipalities between the months of September and December, 2021. In total, 650 youth- and environmentally-focused organizations were contacted via email. Fifty-two organizational representatives responded and subsequently shared the survey link with their organizational, personal and professional contacts. Two organizations shared the survey link on their organization's Facebook page. In total, 549 young people responded to the Qualtrics survey, representing 60 of Peru's 196 provinces across the country. A number of quality checks were implemented to determine the final analytic sample (Aust, Diedenhofen, Ullrich, & Musch, 2013). Responses were excluded from analysis if they met any of the following disqualifications: 1) birth year suggests they are under 18 years of age or 2) did not respond to key questions included in analysis (i.e. aspirations, demographics, geography). The final analytic sample left 387 respondents.

Web-based surveys are powerful data collection tools given their affordability and the shorter timeframe needed for research (Schonlau, Van Soest, Kapteyn, & Couper, 2009). Additionally, in the context of the Covid-19 pandemic, web-based surveys offered a safe alternative to in-person methods. However, web-based surveys are subject to a number of limitations related to nonprobability sampling, under coverage, and self-selection (Baker et al., 2013; Bethlehem, 2010). Nonprobability sampling refers to non-random sampling within a population in which the parameters of the population are undetermined (Baker et al., 2013). In other words, there is no sampling frame from which to draw a sample of potential participants. Additionally, web-based surveys face self-selection issues in which only those who view the survey link and choose to participate will be included, excluding anyone who does not have easy access to the internet or those suspicious of external survey links (Bethlehem, 2010). Under

coverage is another concern related to web-surveys in which only the population with access to the internet is sampled, excluding any young people without internet access. According to INEI (2020), 91% of youth aged 17-24 from urban areas in Peru made regular use of the internet in 2020, compared to 66% of youth in the same age range from rural areas. Older individuals (ages 25+) were less likely to report making regular use of the internet in 2020; only 66% of those from urban areas and 24% from rural areas. Thus, the survey instrument used for this study likely over represents youth who are slightly younger and from urban areas.

To account for under coverage, I apply sampling weights in all analysis, employing a strategy outlined by Valliant and Dever (2018). To develop sampling weights, I draw from the nationally representative Peruvian Permanent Employment Survey (*Encuesta Permanente de Empleo*) collected by INEI between December, 2019 and February 2020 (INEI, 2020a). This strategy assesses the likelihood of survey respondents' participation based on their distribution in the population on a number of characteristics; race, gender, education level and current employment status. While the application of weights reduces estimation biases associated with under coverage, it does not eliminate them (Bethlehem, 2010; Valliant & Dever, 2018). Nor does the inclusion of weights account for self-selection into the survey (Baker et al. 2013). Therefore, given the inferential error associated with nonrandom sampling, self-selection and under coverage, the results from this survey are not meant to be generalizable to all Peruvian youth. In fact, the survey methodology was designed to garner quasi-qualitative insight into the daily lives of youth by including a number of open-ended text response options for which participants could describe their lived experience (Behar-Horenstein & Feng, 2018; Fricker & Schonlau, 2002). Therefore, the results of this survey and subsequent semi-structured qualitative interviews are

intended to elucidate patterns and commonalities across a sub-sample of Peruvian youth and to identify areas for future research.

The survey instrument used for this study included both closed and open-ended questions in five substantive areas: current employment or study situation, future aspirations, demographic information, information about opinions of and experience with mining, and the impacts of Covid-19 on the respondents' lives. The full list of questions is available in Appendix A (English) and Appendix B (Spanish). Table 4.1 below provides a brief summary of the types of questions in each section:

Table 4.1: Summary of survey questions

Question category	Description
Current situation	Participants' current situation included questions of employment status (full-time, part-time, seasonal), study (full-time, part-time, university or technical institute) or other responsibilities (caring for family, preparing for higher education, looking for work, other), travel time to and from their place of work/study, length of time employed or studying and the nature of their work or area of study.
Future Aspirations	What they hoped to be doing in 1 year and 5 years (select all that apply), including: working full- or part-time, studying full- or part-time, starting a family, other.
Demographic Information	Age, gender identity, migration history, race/ethnicity, parental status, marital status, educational attainment, current province of residence
Mining opinions and experience	Assessment of the social, environmental and economic impacts of mining, whether or not they or a family member has ever worked for a mine.
Impacts of Covid-19	Whether participants had contracted the virus, lost a loved one, put off future plans due to the pandemic, or experienced mental health struggles.

Mining opinions and experiences were assessed in two distinct ways based on whether a participant lived in a province with a large-scale mine using Qualtrics skip-logic. While the

questions were the same for all participants, the wording varied slightly for one particular question related to the impacts of mining. Those from provinces without a large-scale mine were asked how they felt about the impacts of mining in *Peru,* while those residing in provinces with large-scale mining activity mine were asked how they felt about the impacts of mining in their *community*. This strategy was meant to capture the nuanced attitudes toward mining by those more directly impacted by large-scale mining activity. Subsequent interviews were conducted to further elucidate differences in opinions about mining between those from and not from mining areas.

Dataset 3: Semi-structured interviews

The final dataset utilized in this project are twelve semi-structured interviews with young people from around Peru. Follow-up interviews were invaluable for providing context, nuance and elaboration on themes that arose from the web-based survey (Creswell & Clark, 2018). Employing qualitative research methods to further explain significant patterns and outliers found in quantitative analysis is a pertinent element of the established mixed-methods research methodology known as explanatory sequential design (Creswell & Clark, 2018). In such studies, qualitative methods follow quantitative methods in order to explain patterns and findings identified from quantitative analysis. To illustrate, young women from the 2007 census were significantly more likely to be employed in service occupations and less likely than young men to be employed in the mining sector in provinces with large-scale mines. Therefore, I asked interview participants about their perceptions of gendered job divisions and availability within mining companies. Similarly, I found survey participants in the present study to hold favorable views of the economic impacts of mining, and thus asked interview participants to further explain their views of mining.

To recruit interview participants, I obtained IRB approval to alter my original study procedures in September 2021. I added a question to the end of the survey asking if participants would be interested in participating in a follow-up interview related to the themes of the survey. Interested participants were directed to a separate Qualtrics survey that was not linked to their prior survey responses in order to protect anonymity. Interested participants provided their name, gender, province of residence and contact information. In total, 38 individuals submitted contact information for a follow-up interview. Participants were contacted via email and/or WhatsApp in January 2022 and twelve participants agreed to participate in follow-up interviews conducted virtually via Zoom or WhatsApp. All interviews were audio recorded with participant permission. Participants chose whether or not to use video during the interviews. I used video in every interview in order approximate in person interviewing as closely as possible.

Semi-structured interviews are well suited for understanding the lived experiences of participants and answering questions of *how* or *why* things occur (Brinkman & Kvale, 2015; Yin, 2013). As such, semi-structured interviews were utilized to address a series of questions which, together, help to better understand the lived experiences of youth growing up around mining towns (Maxwell, 2009). An interview guide was constructed following guidance outlined by Gerson & Damaske (2020), such as asking questions about "what" "when" and "where" followed by more speculative "why" questions and opinion questions. In addition, the guide integrated input from faculty on my graduate committee, and was adapted after field testing with Spanish-speaking friends and relatives. The guide was arranged around four topical areas: (1) individual life-histories and current lived experience, (2) community context (3) knowledge and opinions about mining, and (4) future plans and aspirations. The full interview guide (in Spanish) can be found in Appendix C. The semi-structured nature of the interview process allowed me to

probe surprising or unexpected information relevant to the study's theme while remaining sensitive to interview subjects' comfort (Gerson & Damaske, 2020), and therefore not all participants were asked the exact same questions in the exact same way. However, by orienting the interview around the four central themes, common response patterns began to emerge.

In total, twelve interviews were conducted, including six young women and six young men. Four of the twelve participants were from mining provinces, three of whom were young women. Those not from mining provinces spanned the country from the northern-most coastal region, northern jungle region, and the capital city. Interviews ranged in length from 30-90 minutes, with most interviews lasting around an hour. Interviews were transcribed by a third-party transcription service and analyzed in Spanish by myself using NVivo Qualitative software.

Triangulation

Triangulation is a research strategy of employing multiple forms of data in an effort to enhance a study's validity by integrating methodological approaches and data sources that cover each other's limitations (Singleton & Straits, 2010). For example, some of the limitations of secondary data employed for this study include being outdated (i.e., latest data from 2007) and having a narrow scope of available questions (e.g., youth well-being is captured primarily through education and employment). Independently-collected survey data cover these limitations by offering a contemporary lens and offering a broader range of questions through which to assess youth well-being. However, the primary survey data are not representative due to its virtual format and nonprobability sampling approach, a limitation covered by census microdata. Finally, interview data offer nuanced and narrative experiences of well-being not available through secondary and primary survey data. Therefore, employing secondary and primary data in

conjunction triangulate results related to youth well-being by covering each other's weaknesses and offering a clearer portrait of youth well-being in the context of large-scale mining.

Positionality and reflexivity

Throughout the interview and survey recruitment processes, I was cognizant of my position as a white foreign woman who speaks Spanish as a second language. Prior to this research, I had served four years with the Peace Corps in Peru (2009-2013). I lived in a remote village for two years, becoming intimately familiar with Peruvian culture. My personal and professional familiarity with Peru and the issues faced by Peruvian youth drove my research interests in large-scale mining and youth well-being. In an effort to utilize this place-specific knowledge and my own personal experiences, I fielded questions and provided information about myself and the study to participants prior to each interview through WhatsApp messages. For survey recruitment, I included links to my institutional profiles and provided my contact information (phone number and email) in each email, offering to discuss any questions about my project. As a result, I set multiple meetings with youth leaders and organizers to discuss my survey instrument and research goals, providing space and opportunity to probe my background, experience, methods and research goals. In these meetings, I explained both my research goals, as well as my history living and working in Peru, how I learned to speak Spanish, and my family ties in the country. As such, I made an effort to embrace principals of feminist qualitative research of being cognizant of identity and remaining reflexive about the impact of my physical self and personal background on respondents (McHugh, 2014). During and after interviews, I kept notes about how I felt and the verbal and physical cues of interview participants (Mruck & Mey, 2019). I took ample time to encourage questions, explain or rephrase questions that elicited pause or that participants asked me to repeat, and maintain eye contact when applicable. Such

efforts can never fully alleviate my status as an outsider or how my person influences respondents, but represent cognizant effort to mitigate discomfort and navigate cultural and social differences in international research.

Research Question(s) 1: Has the proliferation of large-scale mining in Peru since the 1990s been associated with improved educational and employment outcomes for youth? Do demographic outcomes for youth in mining provinces differ from provinces unaffected by mines?

Inferring causality within the social sciences is complex, as it is often difficult to isolate factors that directly result in social phenomena. A range of study design and statistical strategies are available to help identify and test causal relationships. In my research, I seek to assess whether the presence of large-scale mines affects a range of youth outcomes. While causal relationships are exceedingly difficult to determine, existing strategies can assess the strength of relationships spatially and temporally in order to establish the direction and strength of a relationship between mining and youth outcomes. Key resources and methodological training in the social sciences suggest that seeking to unambiguously claim causality may be a fruitless exercise. According to Singleton and Straits (2010), the use and understanding of causality in the social sciences has been contentious, with some arguing that the concept is unproductive because it is nearly impossible to prove, while others suggest that causality is a useful framework for hypothesizing the direction and strength of relationships. Mehmetoglu & Jakobsen (2017) similarly suggest that, while some statistical methods can help determine causality, they are "not easily applicable and often presuppose longitudinal data" (p. 5). In the absence of longitudinal

data for the present study, alternative analytical techniques are employed to determine whether mining is associated with certain youth outcomes.

Three strategies are employed in social science research to draw findings closer to establishing causal relationships; association, direction of influence, and nonspuriousness (Singleton and Straits, 2010). Association refers to the relative statistical strength or weakness of two variables, often evaluated using correlation analysis. The second strategy establishes the direction of a relationship, for example, by demonstrating that the presence of a mine was followed by a decline in levels of education. The direction of a relationship – whether X has a positive or negative association with Y – is often the subject of a particular hypothesis, formulated by existing theory. Linear regression is a statistical strategy typically employed to test such hypotheses and directions of relationships. However, establishing that a particular relationship is statistically significant does not establish causality or temporal ordering, but instead offers evidence as to the direction and strength of relationships (Agresti & Finlay, 2009). Finally, nonspuriousness refers to the fact that no other hidden or unaccounted for factor is influencing the relationship between the dependent and independent variables. For example, if a mine in a community was found to be statistically, negatively correlated with lower education among youth in the area, such a relationship may be explained by exogenous factors such as out-migration, school closures, an economic downturn, etc. In order to establish nonspuriousness, social scientists typically include a range of control variables, informed by theory, to account for such external, hidden and contextual factors that may play a role in explaining some outcome. In what follows, I describe how I will determine the direction of relationships, correlation, and account for alternative explanatory factors.

My first research question seeks to test whether the proliferation of large-scale mining projects in Peru has affected youth demographics, employment outcomes, and educational outcomes. Given findings from prior research, I hypothesize that mining provinces will have higher employment rates and higher levels of education (Aragón & Rud, 2013; Bury, 2005; Ticci & Escobal, 2014; Wilson, 2012). A common strategy for assessing the impact of an intervention between two or more time points is the difference-in-differences estimation (Puhani, 2012). Difference-in-differences estimations have been widely used in sociological and economic literature to assess the impacts of mining (Aragón & Rud, 2013; Santos, 2018; Ticci & Escobal, 2014; Zabsonré et al., 2018), hydropower plant infrastructure (de Faria, Davis, Severnini, & Jaramillo, 2017; Sgarbi, Uhlig, Simões, & Goldemberg, 2019) and climate variability (Behrman & Weitzman, 2016; Mrejen, Perelman, & Machado, 2020; Pailler & Tsaneva, 2018). This empirical strategy employs an interaction term in logistic regression models between time and groups. The coefficient of this interaction between time and groups describes the effect of a treatment that occurred between two time points and between these two groups (Puhani, 2012). The difference-in-differences estimation does not account for spatial clusters, but will empirically test whether aggregate youth outcomes have changed significantly over time in provinces that received a large-scale mining project compared do provinces that did not. An important assumption of difference-in-differences estimations is that of parallel trends, meaning that predicted outcomes between treated and untreated groups would have otherwise been similar had there been no intervention (Santos, 2018; Ticci & Escobal, 2014). Because some provinces in Peru are unlikely to receive a large-scale mining development project because there are no minerals to extract, I restrict comparison to provinces that either had a large-scale mine between 1993-2006 (treatment group), or received a mine or mining resolution from the government

between 2007-2020 (control group). By comparing provinces that received mines during Peru's mining boom with provinces that would go on to receive mines in the future, I ensure the provincial contexts are otherwise comparable. In other words, youth in the control provinces *could* experience large-scale mining development, compared to provinces that have never received a large-scale mining project. This ensures that youth exposed to mines are compared only to those in pre-treatment provinces, helping to account for exogenous contextual differences. In total, 51 of 168 provinces either had a mine or received a mine between 1993 and 2020. This strategy is consistent with prior work in Peru, in which districts were compared based on the location of mines and percent employed in the mining sector (Ticci & Escobal, 2014). Building on previous studies employing difference-in-differences estimation to assess the socioeconomic impacts of mining in Peru, and in conjunction with visual assessment of spatial clustering of aggregate youth outcomes, this strategy will allow me to make inferences about the impact of mining developments on aggregate youth outcomes (Aragón & Rud, 2013; Ticci & Escobal, 2014).

Difference-in-differences (DD) models for this analysis utilize secondary data from IPUMS-International from two national Peruvian census', from years 1993 and 2007. These years are ideal for evaluating pre and post- provincial-level effects from large-scale mining projects, which have proliferated since the 1990s (Ticci & Escobal, 2014). I calculate the percent of youth who completed their secondary education, pursued a higher education, are currently employed, and that are employed in the service and mining sectors at the provincial level, described in detail below. Provinces that received mines between 1993 and 2006 were coded as 1 (the treatment), and those that received mines in or after 2007 as 0 in order to isolate the effect of receiving a mine on youth outcomes. Provinces that did not receive a mine prior to 2020 were

excluded from this analysis. In addition, I include a number of relevant controls in an effort to enhance nonspuriousness, including gender, native language, age, marital status, rurality, household size, and household access to water, electricity, and technology (phone, television and computers). All controls are calculated as a percent of the youth population within provinces. I then fit a series of difference-in-difference models using Stata 17's *diff* command. The result of these steps allow me to evaluate whether changes in aggregate educational and employment outcomes for youth are associated with the arrival of a large-scale mine between 1993 and 2006 for the following outcomes:

Dependent variables

Completed or partial higher education: Using the IPUMS-International variable of educational attainment which asks "*What is the last year, grade of study, or level completed?*" of all individuals five years of age or older, a binary variable was created in which those who had some or completed post-secondary college or technical training were coded as 1, all others (secondary schooling or less) were coded as 0 (Minnesota Population Center, 2020). The percent of youth with completed or partial education was calculated from the total youth population within provinces.

Employment status: The IPUMS-International categorical variable for employment status asks all individuals ages six and over "*Last week, you were…*". All those considered employed were coded as 1, and those who were either unemployed or inactive were coded as 0 (Minnesota Population Center, 2020). The percent of youth employed was calculated from the total youth population within provinces.

Childbirth: Drawing from the IPUMS International variable that asks "*how many live-born children have you had in total?*" of all women included in the census, a binary variable was generated in which women were coded as either having one or more children (1) or no children (0) ever born (Minnesota Population Center, 2020). The percent of young women who had a child prior to age 29 was calculated from the total population of women aged 15-29 within provinces.

Additionally, four employment outcome variables were constructed to capture the type of employment in which youth are engaged. These outcomes were assessed using a sub-sample from 1993 microdata (N = 226,082) and 2007 microdata (N = 334,949), including only those who reported being employed at the time of each census. Given the low number of youth reporting mining and extraction as the business in which they were employed[1], the following composite variables capture the number of youth employed in sectors hypothesized to be influenced by the mining sector, including services, professional occupations, construction, and elementary occupations (Bury, 2005; Moran, 2016).

Professional employment: Employment as a professional was created drawing from the IPUMS-international occupation variable that was asked of all individuals ages 6 and older and asks "*what is the main occupation that you performed last week, or the last time you were employed*". Those coded as professionals, associate professionals or legislators were coded as 1, all others were coded as 0. Professionals include occupations

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[1] Of youth ages 15-29 in 1993 and 2007, only 0.59% were employed in mining and extraction alone, drawing from the industry variable from IPUMS international that asks "what does the business, organization, or company in which you work do?" asked of all individuals ages 6 and up (Minnesota Population Center, 2020).

such as managers, directors, legislators, mining engineers, industrial engineers, surveyors, cartographers, doctors, statisticians, sociologists, mining technicians, control operators and demographers, among others (Minnesota Population Center, 2020). The percent of youth with professional occupations was calculated from the population of employed youth within provinces.

Employed in service occupation: Employment in a service profession was created drawing from the IPUMS-international occupation variable that was asked of all individuals ages 6 and older and asks "*what is the main occupation that you performed last week, or the last time you were employed*". Those employed as service workers and shop market sales were coded as 1, which included those working in restaurants, salespeople, police officers, etc. All others were coded as 0 (Minnesota Population Center, 2020). The percent of youth with service occupations was calculated from the population of employed youth within provinces.

Employed in construction/elementary occupations: Employment in a construction or elementary occupation was created drawing from the IPUMS-International occupation variable that was asked of all individuals ages 6 and older. Elementary occupations refer to a range of positions, including building construction laborers, mining and quarrying laborers, garbage collectors, messengers, building caretakers, street vendors, construction and maintenance laborers (roads, dams, etc.), etc. As such, this variable is meant to capture mining employment consisting of manual labor. Individuals were asked "*what is the main occupation that you performed last week, or the last time you were employed*".

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Those employed in plant/machine operation and elementary occupations were coded as 1, all others were coded as 0 (Minnesota Population Center, 2020). The percent of youth with construction/elementary occupations was calculated from the population of employed youth within provinces.

Employment in mining/construction industry: To create this outcome, I drew from the industry variable from IPUMS-International which asks "*what does the business, organization, or company in which you work do?*" of all individuals ages 6 and up. All individuals employed in mining and extraction, construction, transportation, storage and communication were coded as 1. All others coded as 0. This variable offers an alternative measure of those employed by mines in manual labor roles intended to capture the spillover employment associated with large-scale mining infrastructure such as truck driving and construction work. (Bury, 2005; Minnesota Population Center, 2020). The percent of youth employed in mining or construction industries was calculated from the population of employed youth within provinces.

Empirical evidence and the theoretical underpinnings of political economy and dependency suggest that the impacts of large-scale mines are not restricted to provincial boundaries within which they lie (Bernard, Rowe, Bell, Ueffing, & Charles-Edwards, 2017a; Castillo & Brereton, 2018b). Therefore, the next analytical step to test the correlation between mining and youth outcomes is to employ exploratory spatial techniques. Exploratory spatial analysis allows for the evaluation of global and local associations of mining locations with the outcome variables of interest. Such measures is the Moran's *I* test and LISA (Local Indicators of

Spatial Association) statistic, are frequently employed in sociological work to map how values of a variable are clustered (Anselin, 1995; Logan, 2012; Sridharan, Tunstall, Lawder, & Mitchell, 2007). For example, Brasier (2005) employed the Moran's *I* measure in her study to determine whether the controls employed in testing factors associated with farm closure during the farm crisis in the 1980s and early 90s were spatially clustered in certain regions of the U.S. In my study, Moran's *I* and LISA will be employed to visually assess and test whether youth outcomes are spatially clustered around large-scale mining sites (Anselin, 1995; Anselin, Syabri, & Kho, 2006). Combined, difference-in-differences and exploratory spatial techniques offer insight into youth outcomes, aggregated to the provincial level, but do not explain possible variations by gender and rurality. Therefore, additional analytical strategies are applied to respond to my second and third research questions.

Research Question(s) 2: Do educational, employment and demographic outcomes vary across axes of gender and rurality between mine- and non-mining provinces? How so?

Difference-in-differences models are helpful to explore the impact of large-scale mining developments for aggregate youth outcomes, but aggregations may disguise individual-level probabilities of educational attainment, employment and demographic change within a given context (Voss, 2007). In addition, the difference-in-differences estimation in this context can only address the impacts of mines built between the 1993-2006 time period. Finally, aggregated analyses limit the ability to assess the gendered impacts and the impacts for rural youth of mining developments. Therefore, I conduct subsequent logistic regression analysis to assess the

impacts of older large-scale mining projects on the predicted probabilities of individual youth outcomes from older and newer mining provinces.

To assess whether outcomes vary between mining and non-mining provinces and across axes of gender and rurality, I fit a series of logistic regression models to predict whether the presence of a large-scale mine is associated with educational, employment, and demographic outcomes for two samples of youth; from 1993 and 2006. These models have the advantage incorporating the impact of large-scale mines constructed and active prior to 1993. The sample includes all youth ages 15-29, a total of 606,285 individuals in 1993, and 757,156 in 2007. Subsequently, I fit a multinomial regression model for a sub-sample of youth that were employed at the time of the census predicting whether being in a province with a large-scale mine influenced the type of occupation they held, drawing from the occupation variable described below. Finally, I fit logistic regression models interacting gender and rurality with the presence of a mine. All models include clustered standard errors at the provincial-level to account for spatial correlation and contextual labor and employment opportunities (Abadie, Athey, Imbens, & Wooldridge, 2017; Mrejen et al., 2020; Rosales-Rueda, 2018). Three dependent variables from aggregate analysis described in the previous section were unchanged: completed or partial higher education, employment, and childbirth. In what follows, I describe how all other key variables were constructed for analysis.

Dependent variables

Mining Employment: Drawn from the IPUMS-International variable (INDGEN) asked of all individuals over six years old which asks "*What does the business, organization, or company in which you work do/what type of activity did the business, organization or*

company in which you work engage last week?" This variable groups employed

individuals by the activity or product associated with the industry in which the person is

employed, consistent with International Standard Industrial Classification (ISIC). All

individual who employed in mining and extraction were coded as 1, all others were coded

as 0 (Minnesota Population Center, 2020).

In-migrant: The Peruvian Census only collected information on migration status

available in the 2007 census using the question "*Were you living in this district five years*

ago?". All individuals who lived in a different province, department or country 5 years

before were coded with 1 and considered a provincial in-migrant. All others were coded

as 0 (Minnesota Population Center, 2020).

Occupation: A 5-category occupation variable was created drawing from the IPUMS-

international occupation variable that was asked of all individuals ages 6 and older and

asks "*what is the main occupation that you performed last week, or the last time you were*

employed". Youth with occupations included only youth considered employed at the time

of the census. Categories included (1) professional occupations (managers, directors,

legislators, mining engineers, industrial engineers, surveyors, cartographers, doctors,

statisticians, sociologists, mining technicians, control operators and demographers,

among others), (2) Machinery, crafts and trades (construction operators,

metal/mill/chemical operators, mechanics, plumbers, etc.), (3) elementary occupations

(building construction laborers, mining and quarrying laborers, garbage collectors,

messengers, building caretakers, street vendors, construction and maintenance laborers,

etc.), (4) agricultural, clerk or other occupations (agricultural laborers and producers, secretaries, transport service employees, clerks, cashiers,), and (5) service occupations (waitress/waiter, bartenders, hairdressers, police, security and guards, sales and trade) (Minnesota Population Center, 2020).

Predictor/key independent variable

Large-scale mines: Individuals exposed to large-scale mines were measured using a 4-group categorical variable: (1) Those exposed to mines between 1993 and 2006 ("new mine province") if they lived in a province in which a large scale mine with a mining resolution and/or EIA between 1993 and 2006, (2) those exposed to a mine prior to 1993 ("old mine province") according to the date of resolution provided by MINAM (2021), (3) and those living in a province that received a mine prior to 1993 *and* between 1993 - 2006 ("double mine province"). (4) Those who were never exposed to mines were coded as 0.

All models include individual-, household- and community-level controls found to be associated with learning, employment and demographic outcomes (Ames, 2013; Crivello, 2011; Esteve & Florez-Paredes, 2018b; Filmer & Pritchett, 1999; OECD, 2017; Sánchez, Favara, Sánchez, & Favara, 2019). Individual-level controls include gender, age, educational attainment, marital status and native language. Household-level controls include household size, an index of basic needs and an index of access to technology. The index of basic needs includes access to sewage, running water, electricity and a toilet. Access to technology was created using measures

of access to television, internet and phone. Finally, community-level controls include whether the individual lives in a rural or urban place.

Research Question(s) 3: Do lived experiences and aspirations of youth vary by whether or not they grew up around large-scale mines?

   a) How do youth describe their lived experiences and aspirations for the future?

   b) In what ways do the lived experiences and aspirations of youth vary by gender and rurality?

   c) What factors do youth identify that constrain or enable them to reach their aspirations?

   d) What perceptions and opinions about large-scale mining do youth in Peru hold?

Analysis of secondary data is invaluable for evaluating the relationship between mines and employment, educational and demographic outcomes, but does not offer insights into youth aspirations. To answer my third research question, I draw from my independently collected survey and interview data. While this analysis is not generalizable to youth in Peru, it offers contemporary insight as to how and whether there is variation among respondents regarding their current outcomes and aspirations and their exposure to mining. I employ descriptive statistics, the Pearson-chi squared test of correlation, and logistic regression to assess whether residing in a province with a large-scale mine is correlated with five key outcomes: current employment situation, future aspirations (in 1 and 5 years), perceptions of community, and perceptions of mining (Mehmetoglu & Jakobsen, 2017). In addition, I draw from text responses from survey questions about the nature of current employment and study and future aspirations to identify differences in youth employment and topics of study by gender and rurality. Open-ended survey responses were recoded into thematic groups and assigned a number using Excel software, and

then merged into Stata 17 Statistical software using an anonymous response ID. Table 4.2 lists

codes applied to survey respondents that listed 'Other' as their aspiration in 1- or 5-years.

Table 4.2: Codes applied to "other" aspiration survey responses

Code	Summary
1	Stable work/be independent
2	Start own business
3	Study a higher degree (MS, PhD)
4	Volunteer / social work
5	Family or free time to travel, other
6	Part time work/part time study

A full list of codes applied to survey write-in text responses is available in Appendix D.

Whenever possible, codes were consistent with coding rules provided by IPUMS-International

(Minnesota Population Center, 2020).

Analysis of interview data was conducted using NVivo Qualitative software. A list of

provisional codes were developed based on theory, survey data results, and researcher experience

before beginning the coding process in order to better identify patterns that could answer key

research questions (Saldaña, 2016). These codes were descriptive and structural categories, such

as descriptions of family, community and mining. Using a sub-set of interviews, sub-codes were

then developed using affective and elemental coding methods (Saldaña, 2016). Specifically, I

employed concept coding to capture broader themes and meaning of participants' life stories and

aspirations, and evaluation coding to classify perceptions of mining (Saldaña, 2016). All

remaining interviews were coded using existing codes and sub-codes, though some new codes

did emerge. NVivo's cross-tabulation command was employed to identify themes across axes of

gender, rurality and whether or not the participant lived in a mining area. I translated specific

quotations from the interviews from Spanish to English to further explicate findings from both

survey and secondary data analysis.

Chapter 5 – Mine proliferation and youth outcomes across time and space

Research Question(s) 1: Has the proliferation of large-scale mining in Peru since the 1990s been associated with improved educational and employment outcomes for youth? Do demographic outcomes of youth in mining provinces differ from provinces unaffected by mines?

Studies of the aggregate, socioeconomic impacts of large-scale mining projects in Peru and around the world have found limited support for enhanced well-being for those impacted by mines (Apergis & Katsaiti, 2018; Freudenburg & Wilson, 2002; Santos, 2018). In some contexts, large-scale mining has been associated with higher wages and reduced unemployment, coupled with growing social inequality, environmental degradation, rising costs of living and increasingly precarious employment (Bridge, 2004; Bury, 2005; Zabsonré et al., 2018). In Peru, some evidence suggests that mining is associated with educational gains and increased employment opportunities, though others suggest such employment benefits are primarily in the mining sector and may be more temporary and labor-intensive positions (Aragón & Rud, 2013; Bury, 2005; Hinojosa, 2013; Paredes, 2019; Pokorny et al., 2019; Ticci & Escobal, 2014). However, existing research does not specifically assess such impacts for youth. Youth represent Peru's political and economic future, and are often employed within political economies of extractive industries as rhetorical tools to advocate for or against new extraction-based investments (Coffey et al., 2018). If large-scale mining as a national economic strategy is not beneficial for youth, future and existing projects may face increased resistance and even sociopolitical backlash (Maconachie, 2014). Given the continuing expansion of mining investments covering more and more of Peru's geography, understanding the impacts for youth over time and across space is paramount for understanding the lasting impacts of large-scale mining investments in Peru (Werner et al.,

2019). Within a political economic framework, I expect that for large-scale mining to continue to be the nation's economic growth strategy, it should be associated with enhanced capabilities in the form of education and employment opportunities for Peru's youth (Ross, 1999; Sen, 1999). Therefore, I hypothesize that large-scale mining projects implemented between 1993 and 2006 in Peru will be associated with educational and employment benefits for young people in mining areas.

Large-scale mining projects have been found to be associated with community- and regional-level demographic changes. For example, large-scale mining projects have long been associated with influxes of (mostly male) labor migrants (Bainton & Banks, 2018; Castillo & Brereton, 2018a; Moran, 2016; Steel, 2013). Additionally, early studies of fertility in mine-impacted locales found fertility was higher in rural mining areas, though recent research suggests large-scale mining may be associated with reduced sexual promiscuity and risky sexual behavior (Godoy 1985, Wilson, 2012). Youth in transition to adulthood are in a period dense with changes that have the potential to induce aggregate demographic shifts, such as marriage, having children, migrating for labor or other opportunities, and finishing school and entering the labor market (Rindfuss, 1991). Thus, the impacts of large-scale mining projects may be particularly evident in localized demographic processes. I expect that mining areas will display different aggregate demographic trends – specifically, childbearing – than in non-mining areas. Specifically, I expect that young women in mining areas will have lower rates of childbearing compared to their peers in mining areas, attributable to enhanced labor-market and educational opportunities.

In order to answer this first research question, I employ a multi-stage analytical approach to compare aggregate youth outcomes in provinces that received and did not receive mines

during the mining boom of the 1990s and early 2000s. Specifically, I utilize difference-in-differences (DD) models and exploratory spatial analysis strategies to assess the impact of large-scale mines on youth outcomes (Anselin et al., 2006; Brasier, 2005; Puhani, 2012). This multi-stage strategy exploits both the spatial and temporal elements of a unique dataset linking provincial-level youth outcomes with georeferenced data on large-scale mining projects. In what follows, I first discuss the results of DD estimation models for four youth outcomes (employment, secondary school completion, higher education and births to young women) and four employment outcomes (professional employment, service occupations, mine-related occupations and employment in the mining sector). I find aggregate youth outcomes for all outcomes are not significantly different between mine and non-mine provinces between 1993 and 2007. Next, I employ exploratory spatial techniques to assess spatial autocorrelation between large-scale mining projects and youth outcomes, identifying significant clusters of youth outcomes spatially linked to large-scale mining projects.

Difference-in-differences

Difference-in-differences models have been widely used to test the impact of programmatic interventions, large-scale developments, or natural disasters (Behrman & Weitzman, 2016; de Faria et al., 2017; Mrejen et al., 2020; Pailler & Tsaneva, 2018; Santos, 2018; Sgarbi et al., 2019; Zabsonré et al., 2018). In Peru, two studies employed a DD strategy to test the impacts of mining on local development and livelihoods (Aragón & Rud, 2013; Ticci & Escobal, 2014). Their findings offer important insight into the impact of mining developments over time and across communities in Peru. However, previous work has not concentrated on the impacts of mining developments for youth outcomes. In addition, while DD designs are useful

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for isolating the aggregate effects of mining projects within provincial boundaries, they do not capture the influence of such large-scale developments across space. At the time of this writing, I am unaware of any study that has employed spatial analysis techniques in the Peruvian context to assess the impacts of large-scale mining projects on socioeconomic outcomes. In what follows, I present findings of a DD empirical strategy to test the impact of mining developments between 1993 and 2006 on youth social, economic and demographic outcomes. I then use exploratory spatial analysis to assess whether mining developments were associated with the spatial distribution of youth outcomes. This latter strategy is important given the documented impacts of large-scale mining developments beyond the immediate proximity to the mine (Bury, 2005; Gamu et al., 2015; Kotsadam & Tolonen, 2016; Sovacool, 2019).

Table 5.1 below displays descriptive statistics for youth outcomes aggregated into provinces for DD analysis. Importantly, the DD models are restricted to provinces that either a) received a mine between 1993-2006, or b) would receive a mine in or after 2007. This strategy ensures that the provinces under scrutiny are comparable. By isolating the comparison between youth living in a province that received a mine and youth in provinces that *could* otherwise have received a large-scale mining development, I assume youth outcomes would have displayed similarly aggregate trajectories if not for the mining development (Ticci & Escobal, 2014). In other words, provinces have similar geographic characteristics and demographic profiles. Figure 5.1 reveals that mining projects initiated in the mining boom period (1993 - 2006) are concentrated in the Northern Andean region, central coast and Andes, and along the southern coast and Andes. Projects developed that began in or after 2007 are all located in the same regions, offering suitable geographic comparison. All variables included in analysis were calculated as percentages from the total population of youth (ages 15-29), with the exception of

household size, for which the mean household size was calculated for each province. In total, 51

provinces are included in the models, 16 provinces that received mines in or after the year 2007,

and 35 mining provinces in the treatment period (1993 - 2006).

Table 5.1 : Descriptive statistics aggregated at provincial-level, percent of youth (15- 29)

	1993		2007	
	Mine Province	Non-mine province	Mine Province	Non-mine province
	Mean	Mean	Mean	Mean
Employment				
Employed	0.406	0.410	0.427	0.426
Professional occupation	0.036	0.037	0.035	0.038
Employed in service occupation	0.223	0.212	0.316	0.301
Employed in mine-related occupation	0.178	0.176	0.257	0.250
Employed in mining sector	0.047*	0.021	0.094	0.074
Education				
Some higher education	0.214	0.178	0.395	0.345
Demographic				
Birth★★	0.493	0.518	0.448	0.462
In Migrant	–	–	0.292	0.302
Gender				
Women	0.493	0.503	0.483	0.487
Men	0.507	0.497	0.517	0.513
Age				
15-19	0.385	0.382	0.370	0.384
20-24	0.329	0.324	0.330**	0.312
25-29	0.286	0.294	0.300	0.304
Language				
Other	0.055	0.018	0.044	0.013
Quechua	0.252	0.314	0.203	0.274
Spanish	0.687	0.660	0.752	0.712
Marital Status				
Married/in a union	0.166	0.207	0.218	0.249
Single	0.585	0.566	0.610	0.593
Divorced/Widowed/Separated	0.378*	0.394	0.367*	0.386
Mean household size	5.216	5.154	5.216	5.154
Amenities				
Potable water	0.429	0.358	0.488	0.509
Electricity	0.367	0.282	0.599	0.483

Bathroom	0.409	0.388	0.638	0.656
Sewage	0.219	0.171	0.374	0.303
Technology				
Phone	0.018	0.017	0.086	0.065
Computer	0.003	0.002	0.066	0.050
TV	0.347	0.263	0.420	0.331
Rural	0.486	0.596	0.421	0.537
Total number of provinces	**35**	**16**	**35**	**16**

Significance: * p<0.05 ** p<0.01 *** p<0.001 – denotes where mean values in mine provinces that significantly differ from non-mine provinces within a given census year based on two-tailed t-test results

★★ Sample only includes women

Received mine '07 -
Received mine '93 -

Figure 5.1: Provinces included in DD analysis - provincial level boundaries

Patterns of youth outcomes and demographic profiles are similar across time, with few

notable variations between mine and non-mine provinces. For example, the percent of youth on

average with a primary education or less dropped dramatically in mining provinces, from 61% to

47%. In non-mining provinces, this drop was less noteworthy, falling only 8 percentage points

from 61% to 53%. Overall, employment rates in mine and non-mine provinces increased over

time. Similarly, demographic shifts were consistent across time and space. More youth in Peru

speak Spanish as their native language in 2007 compared to 1993, a larger proportion of youth have higher educational training, are single, and have access to basic amenities and technology. The percent of youth living in rural areas is higher than the national average in both mine and non-mine provinces. Nearly 60% of youth in non-mine provinces lived in rural areas in 1993, compared to 54% in 2007. This is attributable to the provinces included in analysis; large-scale mining projects are often located in rural and remote locations.

The descriptive overview suggests that only the percent of youth employed in the mining sector in mining provinces in 1993 was significantly higher than in non-mine provinces. No other aggregated youth outcomes between mine and non-mine provinces between 1993 and 2007 was found to be significantly different between mine/non-mine provinces according to two-tailed t-tests of statistical significance. The results of DD estimation models for key youth outcomes confirm this expected result. Table 5.2 displays difference-in-differences estimation models predicting the percent of youth who completed or partially completed higher education, those that are employed and those who had at least one child (includes only women). As expected, the interaction term between mine province and year is not significant for any outcome, suggesting large-scale mining projects at the provincial level did not influence aggregate youth outcomes.

Table 5.2: Difference-in-Differences estimation comparing aggregate youth outcomes between 1993-2007, mine provinces vs non-mine provinces

	(1) % Higher Education		(2) % Employed		(3) % Child birth	
	Coeff.	SE	Coeff.	SE	Coeff.	SE
Year (1 = 2007)	0.043	0.035	-0.005	0.034	-0.033*	0.016
Province received mine	0.016	0.021	0.018	0.020	0.010	0.010
Received Mine * Year 2007	**-0.050**	**0.029**	**-0.026**	**0.028**	**0.004**	**0.015**
Women	0.157	0.320	-0.841**	0.305	–	–
Age (ref: 15-19)						
20-24	0.659	0.427	1.463***	0.413	-0.140	0.213
25-29	1.231**	0.431	0.458	0.430	0.627**	0.194
Education (ref: secondary or less)						
Higher education	–	–	-0.016	0.105	-0.226***	0.054
Language (ref: other)						
Quechua	-0.033	0.073	0.134	0.070	0.089*	0.036
Spanish	-0.003	0.077	0.225**	0.074	0.146***	0.038
Marital Status (ref: divorced/widowed)						
Married/in a union	0.435*	0.201	0.179	0.197	0.211*	0.096
Single	0.944***	0.213	-0.558*	0.225	-0.684***	0.110
Mean household size	-0.041	0.028	-0.047	0.027	-0.035**	0.013
Amenities						
Potable water	-0.114	0.070	-0.069	0.068	-0.007	0.035
Electricity	0.078	0.097	-0.051	0.093	0.031	0.047
Bathroom	-0.120*	0.059	0.079	0.058	-0.005	0.029
Sewage	0.265*	0.131	0.121	0.128	0.013	0.066
Technology						
Phone	0.240	0.218	0.280	0.209	0.120	0.108
Computer	1.093***	0.303	0.060	0.311	0.029	0.155
TV	0.135	0.104	-0.079	0.100	-0.043	0.051
Rural	-0.058	0.086	0.026	0.083	-0.048	0.043
Constant	-0.863*	0.416	0.544	0.406	0.852***	0.186
Observations	102		102		102★★	
R-squared	0.918		0.588		0.853	

Note: All variables are calculated percentages at the provincial level
Significance: * $p<0.05$ ** $p<0.01$ *** $p<0.001$
★★ Sample includes only women

Next, I test whether certain types of employment associated with the mining industry significantly changed in the same time period between mine and non-mine provinces. Theoretically, I expected mining areas to have more youth employed in mining-related

occupations and in the mining sector (Aragón & Rud, 2013; Bury, 2005; Ticci & Escobal, 2014).

However, given the descriptive results, I do not expect to see significant differences between

mine and non-mine provinces over time. Indeed, Table 5.3 displays the results of four DD

models predicting the percent of youth employed in professional roles, in service occupations, in

mining-related occupations and in the mining sector. The DD interaction term reveals no

significant difference over time and between mine and non-mine provinces in the percentage of

youth engaged in these four employment outcomes. However, two significant relationships

across time emerge. First, that significantly fewer youth are employed in professional

occupations in 2007 compared to 1993, and significantly more youth are employed in service

occupations, mining-related occupations, and in the mining sector in 2007 compared to 1993. In

addition, the percent of women employed is significantly lower across all outcomes in 2007

compared to 1993, suggesting a gendered pattern of employment in certain sectors over time.

Table 5.3: Difference-in-Differences estimation comparing aggregate youth employment outcomes
between 1993-2007, mine provinces vs non-mine provinces

	(4)		(5)		(6)		(7)	
	% Professional Occupation		**% Service Occupation**		**% Mining-related occupation**		**% Mining sector**	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Year (1 = 2007)	-0.023***	0.004	0.093**	0.029	0.093***	0.027	0.113***	0.018
Province received mine	-0.002	0.003	0.003	0.017	0.002	0.016	0.006	0.011
Received Mine * Year 2007	**-0.003**	**0.004**	**-0.011**	**0.024**	**-0.005**	**0.023**	**0.003**	**0.015**
Women	-0.156***	0.040	-0.659*	0.259	-0.620*	0.246	-0.537**	0.162
Age (ref: 15-19)								
20-24	-0.086	0.054	1.246***	0.350	1.118**	0.333	0.287	0.219
25-29	-0.027	0.056	0.344	0.365	0.181	0.347	0.495*	0.228
Education (ref: secondary or less)								
Higher education	0.054***	0.014	0.023	0.089	0.003	0.085	0.066	0.056

Language (ref: other)								
Quechua	0.011	0.009	0.098	0.059	0.103	0.056	0.048	0.037
Spanish	0.012	0.010	0.154*	0.062	0.169**	0.059	0.025	0.039
Marital Status (ref: divorced/widowed)								
Married/in a union	0.081**	0.026	-0.050	0.167	-0.023	0.159	-0.421***	0.104
Single	-0.046	0.029	-0.238	0.191	-0.211	0.182	0.020	0.119
Mean household size	0.004	0.003	-0.042	0.023	-0.043	0.022	-0.022	0.014
Amenities								
Potable water	0.013	0.009	-0.056	0.058	-0.044	0.055	0.047	0.036
Electricity	0.020	0.012	-0.133	0.079	-0.126	0.075	-0.195***	0.049
Bathroom	0.000	0.008	0.072	0.049	0.065	0.047	-0.125***	0.031
Sewage	0.011	0.017	0.008	0.109	-0.032	0.103	-0.038	0.068
Technology								
Phone	-0.017	0.027	0.228	0.177	0.134	0.168	0.016	0.111
Computer	0.088*	0.041	-0.238	0.264	-0.244	0.251	-0.175	0.165
TV	-0.028*	0.013	0.156	0.084	0.149	0.080	0.245***	0.053
Rural	-0.013	0.011	-0.032	0.070	0.013	0.067	0.021	0.044
Constant	0.124*	0.053	0.265	0.345	0.254	0.328	0.217	0.215
Observations	102		102		102		102	
R-squared	0.812		0.744		0.683		0.797	

Note: All variables are calculated percentages at the provincial level
Significance: * p<0.05 ** p<0.01 *** p<0.001

The results of DD estimation models suggest that there are no significant differences in aggregate educational, demographic, and employment outcomes for youth over time between provinces that received large-scale mines and otherwise similar provinces that did not receive a large-scale mining project. Counter to the developmental narrative that associates mining with jobs and economic growth, this finding suggests that large-scale development projects are not significantly associated with broad educational and employment gains for young people living in those areas. On the other hand, the positive and significant coefficients for the year dummy variable (1 = 2007) for employment in service occupations, mining-related occupations and in

the mining sector reveal a pattern of specialized employment among youth in Peru's northern, central coast, and southern cone regions (Ticci & Escobal, 2014). This specialization of increasingly precarious, labor-intensive, and low-skilled labor, may suggest that youth well-being in the form of stable, professional employment is being undermined within Peru's political economy of mining. Subsequent analysis in Chapter 6 further disentangles this relationship by assessing the individual-level odds of youth employment in different occupations.

A number of limitations to the DD approach temper the results. First and foremost, comparing youth outcomes at the aggregate, provincial-level does not capture the internal, interconnected work flows that characterize Peruvian labor markets, and the mining industry in particular (Bernard et al., 2017a; Dell, 2010; Vincent, 2000). Previous studies have found that internal migration among youth in Peru and in Latin America is typified by rural outmigration to small towns or departmental capitals, a process difficult to capture using the DD approach (Rodríguez-Vignoli & Rowe, 2018). In order to assess possible spatial effects of mining, I employ exploratory spatial analytical techniques on the spatial dimensions of youth outcomes and large-scale mining developments in Peru.

Analysis of spatial clustering and autocorrelation

The effects of large-scale mining projects likely extend beyond provincial boundaries. In fact, the physical location of a mining project may lie within a particular province, but the urban hub serving the transport and labor demands of the mine may lie within another province (Castillo & Brereton, 2018a). In addition, internal, interconnected work flows in Peru, while difficult to capture, are typically between provinces and within departments, such as from a small town to a larger departmental capital (Bernard, Rowe, Bell, Ueffing, & Charles-Edwards, 2017b). Given previous work in the region, I expect youth employment and educational

experiences to occur within regional clusters rather than within provincial boundaries (Castillo & Brereton, 2018a; Crivello, 2011; Rodríguez-Vignoli & Rowe, 2018).

Connectivity maps in Figure 5.2 were generated using GeoDa's spatial weight generator and display the interconnections between 168 provinces. Spatial weights are applied either by shared borders (contingency weights) or by distance from spatial points (distance weights). Province-level boundaries are based on IPUMS-International harmonization of boundaries and population change between 1993 and 2007 (Minnesota Population Center, 2020). Youth outcomes are aggregated to the province-level for all subsequent analysis. This spatial file uses centroids (center points within each province) rather than polygons, making spatial distance weights more appropriate for analysis. Connectivity maps shown in Figure 5.2 reveal high levels of interconnection using distance-based weights (Queen contingency weights) that appropriately capture the interconnected work flows and high rates of internal migration in Peru (Bernard et al., 2017b). For this analysis, I employ Euclidean distance weights, which display dense regional interconnections theoretically appropriate for the Peruvian context.

Nearest neighbor weights   Euclidean distance weights

Figure 5.2: Spatial Weight connectivity maps

In order to test for spatial autocorrelation of youth outcomes, I calculate the univariate and bivariate Moran's *I* statistic, displayed in Table 5.4. The Moran's *I* reveals whether variables are clustered across space (Logan, 2012). Because the Moran's *I* must be calculated using a continuous variable, univariate and bivariate Moran's *I* statistics are calculated using the continuous measure of hectares occupied by mines within each province.

Table 5.4: Univariate and Bivariate Moran's I statistic of spatial autocorrelation of youth outcomes and large-scale mine hectares

	1993		2007	
	Univariate Moran's *I*	Bivariate Moran's *I*	Univariate Moran's *I*	Bivariate Moran's *I*
Employment				
Employed	0.170***	-0.041**	0.041*	-0.009
Professional occupation	0.074**	0.013	0.116***	0.050**
Employed in service occupation	0.063**	0.008	0.051*	0.035*
Employed in mine-related occupation	0.115***	0.013	0.014	0.019
Employed in mining sector	0.054*	-0.005	0.072**	0.039*
Education				
Some higher education	0.156***	0.007	0.227***	0.107***
Demographic				
Children born	0.249***	-0.028*	0.243***	-0.114***
In-migrant			0.067**	0.012
Total number of provinces	168	168	168	168

Note: Moran's *I* significance calculated using 999 permutations
Bivariate Moran's I (1993) calculated by hectares taken up by mines in prior to 1993
Bivariate Moran's I (2007) calculated with the number of hectares taken up by the mines between 1993-2007
* p<0.05 ** p<0.01 *** p<0.001

The Moran's *I* is interpreted by both the positive or negative slope and the value. Positive slopes suggest spatial clustering and negative slopes suggest spatial dispersion. The calculated

Moran's *I* value reveals amount of clustering or dispersion, while the calculated significance exposes the strength: The higher the statistically significant positive value, the more spatial clustering can be deduced. The positive, significant values for the univariate Moran's *I* statistic across all variables in 1993 suggest significant spatial clustering, though the values are low. The positive slope indicates that certain regions within Peru have areas of high youth employment and/or educational attainment, and others have low youth employment and/or educational attainment. The bivariate Moran's *I* statistic calculated for 1993 outcomes reveals a significant spatial relationship for youth employment and births among young women and land area occupied by mining. Specifically, the negative slope suggests the relationship between mining areas and these outcomes is dispersed rather than clustered, though the values are low. The lack of significant spatial correlation between hectares occupied by large-scale mining projects and youth outcomes is unsurprising given the low number of large-scale projects in operation prior to 1993.

A number of youth outcomes in 2007 reveal a pattern of spatial clustering, indicated by the positive and significant univariate Moran's *I* values. In particular, the univariate Moran's *I* value is significant at the p<0.001 level and positive for the percent of youth with partial or completed higher education, suggesting a high degree of spatial clustering for these outcomes. Spatial clustering of young women who experienced a birth between ages 15 and 29 is significant. Closer scrutiny of the clustered Moran's *I* values (not shown) reveals the majority of provinces with higher percentages of young mothers concentrated in the jungle region of the country, and the lowest percentages among provinces along the coast and the southern cone region. Similarly, employment and professional employment among youth reveal patterns of spatial clustering in 2007. Higher rates of professional employment are concentrated around the

nation's capital and southern coastal and Andean regions and lower rates are found in the northern highlands. The bivariate Moran's *I* between space occupied by large-scale mines and youth outcomes reveals spatial clustering for the percent of youth employed in professional occupations, service occupations, and in the mining sector. Similarly, positive bivariate Moran's *I* for the higher education outcome suggests spatial clustering around mining areas. Finally, the negative and significant bivariate Moran's *I* value for the percent of young women who had a child suggests spatial dispersion rather than clustering in relation to large-scale mining operations.

LISA spatial association

In order to better understand where and how youth outcomes are clustered across space in relation to large-scale mining projects, I employ the Local Indicators of Spatial Association measure (LISA) (Anselin, 1995). The LISA measure helps identify "hot spots" of a relationship between two variables by decomposing the Moran's *I* statistic into spatial cluster typologies (Anselin, 1995). The maps in Figure 5.3 display where significant spatial clustering of youth outcomes exist using the univariate Moran's *I*, overlaying geo-referenced large-scale mine locations for mines that began operations between 1993-2007 (indicated by a black dot). In other words, Figure 5.3 decomposes youth outcomes into four typologies: high-high, low-low, low-high, and high-low, indicating the degree of similarity with neighboring provinces for each province, and hence the degree of spatial autocorrelations. LISA maps are not calculated for the bivariate Moran's *I,* as it is difficult to appropriately interpret (Anselin, 1995).

Cluster typologies are helpful for identifying areas in which youth outcomes are significantly higher or lower than other surrounding provinces. To illustrate, provinces designated as "high-high" for the higher education outcome are those in which the percent of

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youth with a partial or completed higher education is high and the surrounding provinces also have a higher percentage of youth with partial or completed higher education. In other words, the "high-high" typology identifies clusters of provinces in which the percent of youth achieving a higher education is higher than average *and* is surrounded by other provinces with higher-than-average percentages of youth obtaining the same outcome. Put another way, the "high-high" typology signals spatial clustering of an outcome across many provinces in the same region. To offer another example, a "high-low" province is one in which the percent of youth obtaining an outcome within that province is high, but surrounding provinces have a lower-than-average percent of youth obtaining the same outcome. Figure 5.3 displays typologies found to be statistically significant. The provincial boundary shaded in gray represents Lake Titicaca, a boundary with no associated provincial-level population data provided in the IPUMS harmonized shape file (Minnesota Population Center, 2020). Figure 5.4 displays a political map of Peru with department-level boundaries for reference.

Figure 5.3: LISA maps of youth outcomes

Figure 5.4: Map of Peru, department-level boundaries

Map accessed from: https://geology.com/world/1200/peru-political-map.jpg ;
March 21, 2022

Significant spatial clustering is found among the majority of provinces for partial or

completed higher education. Ninety-three provinces were identified as having significant spatial

clustering of youth who obtained partial or completed higher education, the majority of which

typified as "low-low" (N = 43). Provinces with lower rates of youth with higher education

surrounded by other provinces with lower rates of youth with higher education are found predominantly in the North of the country where a nearly a dozen large-scale mining projects are located. On the other hand, provinces typified as "high-high" (N = 32) are found in the central coast and southern cone of the country. The central coast is home to the nation's capital city (Lima) and is therefore unsurprising that rates of higher education would be higher among youth in that area. However, "high-high" typologies are also identified for provinces in which large-scale mining projects are located in the central Andean region and Southern coast near Lima. Similarly, provinces are typified as "high-high" in the Southern cone of Peru, home to a handful of large-scale mining projects. The "high-high" and "low-low" hot spots identified in Peru suggest that the relationship between mines and higher education may vary across space. Youth in the Southern and central regions of Peru appear to experience educational gains associated with proximity to large-scale mining projects, while those in the Northern region do not. Finally, it is noteworthy that only four provinces that house large-scale mining projects do not display significant spatial clustering (three in the south of Peru, one in the North).

The percent of youth with professional occupations is found to be significantly spatially clustered in half of all Peruvian provinces. Nearly all of the "low-low" categorized provinces are clustered in the Northern region of Peru around a number of large-scale mining projects, indicating that such provinces have a low percentage of youth with professional occupations surrounded by other provinces with low percentages of youth with professional occupations. However, about half of the Northern mining provinces are categorized in the "high-low" typology, suggesting a higher percentage of youth obtained professional positions *within* provinces that are homes to large-scale mining projects, but fewer obtained such roles in surrounding provinces. This could be attributable to in-migration of young professionals into

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provinces with mines, a mechanism not captured by DD and spatial methods (Castillo &

Brereton, 2018b).

Provinces designated as having a significant "high-high" spatial relationship for

professional occupations are clustered in the central coast and Andean region of the country, near

the capital city, and in the southern coastal region near a number of large-scale mining projects

and the border with Chile. Higher rates of youth professional employment are to be expected

around the capital city, where professional job opportunities are more prevalent. The "high-high"

typology for one southern province with two large-scale mines suggests the mines *could* be

associated with increased professional opportunity in that region. Clustering of youth in service

occupations is significant in 47 provinces, though typologies identified do not appear to

consistently overlay mining locations, suggesting service occupations are less concentrated in

mining areas.

Finally, significant cluster typologies of those employed in the mining sector are found in

36% (N = 60) of provinces. The majority of provinces found to have significant spatial clustering

of youth employed in the mining sector are in the "low-low" typology (N = 39), primarily

located in the northern Andean and jungle regions. However, a handful of provinces in the

northern Andean region – several home to large-scale mining projects – are considered places

with high percentages of youth employed in the mining sector surrounded by provinces with low

percentages of youth in mining. However, a large number of provinces that house mines have

low youth employment in the mining sector or are not identified as having significantly high or

low levels of youth employment in mining. Provinces categorized as "high-high" for this

outcome are clustered around the capital and along the southern coast near a number of large-

scale mining projects. What emerges is a pattern of geographic inequality for youth outcomes.

Those in the north of the country appeared to be at an employment and educational disadvantage in 2007 compared to youth in the central and southern regions. Most of the areas identified as spatially significant "hot spots" for education and employment overlay large-scale mining project areas, suggesting mining may play a role in youth outcomes differently across space.

Chapter synthesis

In summary, my first research question asks whether the increase in large-scale mining projects in the 1990s and early 2000s was associated with improved educational and labor outcomes for youth or significant changes in demographic outcomes. Drawing findings from DD models, I find that youth educational, labor and demographic outcomes do not significantly differ between provinces that received a large-scale mining project and those that did not (but otherwise could have) in the 14-year period between 1993 and 2007. The conclusion drawn from this finding is that youth outcomes aggregated at the provincial level in 2007 are not significantly better or worse than youth outcomes in 1993 in otherwise similar provinces, whether or not the province experienced a large-scale mining development. This finding is contrary to the widely maintained narrative about the broad employment benefits brought by mining investment (Coffey et al., 2018; North & Grinspun, 2016). From a political economy perspective, the impact of mining as a national economic growth strategy has not had aggregate impacts on youth well-being, despite national GDP growth (Bebbington et al., 2008; Bunker, 1984; Soto-Viruet, 2022). Most notably, for the country's largest demographic group representing the nation's future economic and political stability, large-scale mining has not significantly improved employment opportunities for youth, nor has it significantly enhanced aggregate higher educational attainment for those residing in mining areas.

Contrary to my predictions and to prior work suggesting large-scale mining investments are associated with shifts in sexual behaviors that may reduce childbearing among young women (Wilson, 2012), I do not find any significant difference in childbearing between women in 1993 and 2007 in mining provinces vs. non-mining provinces. While the significant, negative coefficient for 2007 suggests women were having fewer children before age 29 compared to women in 1993, the interaction with living in a mine province was not found to be significant. This finding suggests that proximity to large-scale mining projects was not associated with shifting patterns of childbearing among young women in Peru.

Exploratory spatial analytical tools offer an alternative lens through which to assess the impacts of large-scale mining impacts within the political economic framework. Because DD models do not reveal spatial variation in youth outcomes beyond provincial boundaries, I employ univariate and bivariate Moran's I statistics and LISA cluster maps to demonstrate that educational and labor-market gains were felt unevenly among youth in regionally specific ways. Youth living in northern provinces displayed fewer educational and employment gains, while youth in the central coast and southern regions had higher aggregate educational and labor-market outcomes. These exploratory spatial results suggest certain projects may have better and broader impacts for youth compared to others, though additional research is needed to disentangle this pattern. What emerges is a portrait of mining impacts that vary across space that may not be adequately captured by aggregations of youth outcomes at the national level. Given the limitations associated with aggregating youth outcomes for DD and spatial analysis, the following chapters employ alternative analytical strategies to predict individual-level youth outcomes in mining areas in order to triangulate our understanding of the impacts of large-scale mining for youth outcomes (Singleton & Straits, 2010).

Chapter 6 – What are the odds? Youth well-being in mining areas

Research Question 2: Do educational, employment and demographic outcomes vary across axes of gender and rurality between mine- and non-mining provinces? How so?

Rural sociologists and demographers have a long tradition of paying attention to the spatial dimensions of human action, incorporating context into analysis of broader social and economic changes (Voss, 2007). In the previous chapter, aggregate analyses of the impacts of large-scale mining for youth in Peru did not reveal any significant employment and educational benefits for youth in mining areas over time. However, exploratory spatial analysis demonstrated broader regional impacts extending beyond provincial boundaries. While both analyses situate youth within their geographical contexts, both "fail to recognize that it is the individual, not aggregates, who act" (Voss, 2007, p. 463). Province-level analyses of youth in mining vs non-mining areas tell us little about the odds of *individual* young people gaining employment, obtaining higher education, or migrating within provinces or departments. Similarly, aggregations used in DD analysis do not offer insight into differences between rural and urban areas, or between young men and women. Finally, DD analysis does not incorporate the impact of older mines that existed prior to 1993. This chapter aims to fill these analytical gaps by predicting a set of individual-level outcomes in both 1993 and 2007 based on exposure to large-scale mines built before and after 1993.

Existing research demonstrates the ways in which large-scale mining projects impact communities and individuals unequally across space (Castillo & Brereton, 2018a; Werner et al., 2019). For example, those in rural areas near mines may be pushed off their land or find their land irreparably damaged, and thus be forced to find alternative livelihood strategies

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(Bebbington, Humphreys Bebbington, et al., 2008). On the other hand, large-scale mining projects may offer new employment opportunities for rural youth, allowing them to find alternative income activities near their homes that were not previously available (Vincent, 2000). In urban areas, neighboring large-scale mines have been found to be associated with higher incomes but increased social inequality (Bury, 2005). Therefore, urban youth may find themselves in households with better standards of living, but facing limited opportunity for social mobility. In addition, a young person's family and hometown identity are hypothesized to influence their decisions and aspirations (Sen, 1987). Proximity to mines may influence community and family attitudes toward mining, affecting youth choices related to pursuing work with a mine (Paredes, 2019). In addition, the ways in which nearby large-scale mining activity influences the opportunity structures in areas affected by mining have implications for youth outcomes. For example, additional educational opportunities may arise as local training institutions and universities orient their programming toward mining employment (i.e., engineering, heavy machinery operation). Indeed, higher educational opportunities and attainment has been on the rise in Peru (Guerrero & Rojas, 2020). However, since large-scale mines in Peru have historically hired people outside of local communities into well-paid positions, I expect youth employment opportunities to be limited to physical labor and low-skilled positions (Bebbington & Humphreys Bebbington, 2018; Bury, 2005). On the other hand, I anticipate existing inequalities in employment between rural and urban areas to persist in areas impacted by mines (OECD, 2017). In other words, specialized employment opportunities for youth in non-mine sectors (such as in services or professional work) but related to servicing the mining industry will be concentrated in urban centers (Bury, 2005; Castillo & Brereton, 2018b).

The impacts of large-scale mining developments have been demonstrably gendered (Mahy, 2011; Segerstedt & Abrahamsson, 2019). Women in mining-dominated economic areas face limited job opportunities, lower pay, and increasing gender violence inside and outside the home (Eftimie et al., 2009; Oxfam, 2017; Park et al., 2019). Traditional aggregate methods assessing the impacts of large-scale mines in Peru and elsewhere have overlooked possible differential impacts for women, a gap this analysis seeks to fill (Aragón & Rud, 2013; Ticci & Escobal, 2014). Given rising educational attainment among Peruvian women and the enhanced educational opportunities that may arise in mining areas, I expect both young women and men in mining areas to achieve higher educational attainment (Guerrero & Rojas, 2020). However, I expect young women in mining areas to be significantly less likely to be employed compared to young men in mining areas and young women in non-mine areas. In addition, I expect women's employment in mining areas to be clustered in the service sector compared to other positions. For young men, I expect they will be more likely to be employed compared to women, and more likely to occupy roles demanding physical labor.

Demographic shifts often captured in aggregate trends over time can also be identified in individual probabilities of behavior across time and space (Voss, 2007). Mining areas have historically been associated with large influxes of young male migrants (Castillo & Brereton, 2018b; Steel, 2013). Therefore, I expect youth in mining areas to have significantly higher odds of identifying as a provincial in-migrant compared to non-mining areas. Additionally, I expect young men and those in urban areas to be significantly more likely to be migrants compared to those in rural areas or young women. The likelihood of a young women becoming a mother before age 29 may also be impacted by proximity to mines. Evidence suggests that the influx of highly trained and educated professionals may be associated with reductions in risky and

transactional sexual activity among youth (Wilson, 2012). On the other hand, early research of coal mining areas in the U.S. and Europe found higher fertility in mining areas, associated with low labor-market opportunity for women and high rates infant mortality (Godoy, 1985). Women's limited labor-market opportunity in mining areas could make romantic unions and family formation more probable. For example, in Canada, an increase in pregnancies was found in rural areas impacted by coal production (Shandro et al., 2011). Aggregate analysis of youth outcomes in the previous chapter did not reveal a significant difference in childbearing among women in areas that received mines between 1993 and 2006. Therefore, I expect young women in 2007 in mining areas will not be significantly more or less likely to have had children before age 29 compared their peers in non-mining areas. On the other hand, I expect women in 1993 in areas that received mines to be less likely to have a child before age 29, associated with the influx of outside professionals, increased labor-market opportunity, and growing educational opportunities. Finally, I expect women in rural areas affected by mines to have a higher probability of childbirth compared to their rural peers in non-mining areas. In what follows, I present the results of logistic and multinomial regression models predicting youth educational, employment and demographic outcomes. I then incorporate interaction terms for gender and rurality to test whether the probabilities of each outcome significantly differ between groups. Finally, I extend exposure to mines to departmental-level boundaries to account for possible broader impacts beyond provincial boundaries.

Descriptive Statistics

Table 6.1 displays descriptive statistics for both the 1993 and 2007 census samples. All outcome, predictor and control variables are binary variables with the exception of household-

level characteristics. More youth pursued higher education and were employed in 2007 compared to 1993. On average, slightly more youth were employed in all occupations and in the mining sector in 2007, with the exception of agriculture, clerks and other types of occupations. More youth were residing in urban areas compared to rural areas in 2007 and had better access to technology and services that meet their basic needs (running water, electricity, toilets). Finally, in 2007, only 15% of young people lived in provinces that received mines in the 1993-2007 time period, compared to around 4% of those exposed to large-scale mines in 1993.

Table 6.1: Descriptive statistics, individual-level analysis

	1993				2007			
	Mean	Std. Dev.	Min.	Max.	Mean	Std. Dev.	Min.	Max.
Outcome variables								
Higher education	0.232	–	0	1	0.310	–	0	1
Employed	0.412	–	0	1	0.456	–	0	1
Mining sector ★	0.010	–	0	1	0.016	–	0	1
Professional occupation★	0.134	–	0	1	0.139	–	0	1
Machinery/crafts/trades★	0.183	–	0	1	0.214	–	0	1
Elementary occupation★	0.301	–	0	1	0.330	–	0	1
Service occupation★	0.145	–	0	1	0.163	–	0	1
Agricultural, clerk or other occupation★	0.237	–	0	1	0.155	–	0	1
Provincial in-migrant	–	–	–	–	0.131	–	0	1
Children born★★	0.422	–	0	1	0.403	–	0	1
Exposure to large-scale mine								
Mine province ('93 - '07)	–	–	–	–	0.113	–	0	1
Double mine province	–	–	–	–	0.036	–	0	1
Old mine province (pre '93)	0.080	–	0	1	0.045	–	0	1
Individual-level characteristics								
Male	0.490	–	0	1	0.498	–	0	1
Female	0.510	–	0	1	0.502	–	0	1
Age		–	0	1		–		
15 – 19	0.378	–	0	1	0.360	–	0	1
20 – 24	0.336	–	0	1	0.335	–	0	1
25 – 29	0.285	–	0	1	0.304	–	0	1
Education		–	0	1		–		
Primary or less	0.547	–	0	1	0.418	–	0	1

Completed secondary	0.221	–	0	1	0.273	–	0	1
Some or completed higher ed.	0.232	–	0	1	0.310	–	0	1
Native language		–	0	1		–		
Other	0.028	–	0	1	0.024	–	0	1
Spanish	0.838	–	0	1	0.873	–	0	1
Quechua	0.134	–	0	1	0.103	–	0	1
Marital status		–	0	1		–		
Separated/divorced/widowed	0.015	–	0	1	0.022	–	0	1
Single/never married	0.653	–	0	1	0.643	–	0	1
Married/in union	0.332	–	0	1	0.336	–	0	1
Household-level characteristics								
Household size	5.855	2.959	1	30	5.273	2.667	1	30
Basic needs index	2.382	1.642	0	4	2.903	1.404	0	4
Access to tech. index	0.705	0.674	0	3	1.093	1.010	0	3
Community characteristics								
Urban	0.747	–	0	1	0.783	–	0	1
Rural	0.253	–	0	1	0.217	–	0	1
N	606,285				757,156			

★ Sample includes only youth employed at time of census: N(2007) = 334,949, N(1993) = 238,575

★★ Sample includes only women: N(2007) = 380,616, N(1993) = 322,381

In order to disentangle the impacts of large-scale mines on individual-level youth outcomes, I fit logistic regression models predicting the odds of completing some higher education, current employment, employment in mining (among those youth that are employed) or first childbirth (among young women) for both the 1993 and 2007 census samples. The probability of a young person being an in-migrant is predicted for the 2007 sample. Whether or not individuals lived in a province with a large-scale mine ("old mining province") is the primary predictor for the 1993 sample. In 2007, the primary predictors are whether individuals resided in a province with a mine built before 1993 ("old mining province"), with multiple mines built both before and after 1993 ("double mine province") and with a mine built between 1993 and 2006 in provinces that did not previously have a mine ("new mining province").

Table 6.2 reveals the logistic regression results for the 1993 census sample of youth. The results suggest that youth in 1993 who were exposed to large-scale mining projects had significantly lower odds of being employed. In addition, gender and rurality are significant

predictors of each outcome of interest. For example, women in 1993 are predicted to have had lower odds of being employed or have a job in mining compared to men, but higher odds of completing some or all higher education. Somewhat surprisingly, youth from rural areas had significantly higher odds of being employed in 1993, though this finding may be a function of employment being measured as activity in the past week, including family businesses or work without pay.

Table 6.2: Logistic regression models predicting education, employment and demographic outcomes by large-scale mine exposure in 1993

	(1) Higher Education		(2) Employed		(3) Mining Employment		(4) Children born	
	Odds Ratio	S.E.	Odds Ratio	S.E.	Odds Ratio	S.E.	Odds Ratio	S.E.
Old mining province (pre '93)	1.189	0.167	0.848**	0.053	2.484	1.733	0.820	0.087
Individual-level characteristics								
Gender (female)	1.143***	0.035	0.254***	0.036	0.218***	0.041	–	–
Age (ref: 15-19)								
20-24	5.313***	0.098	3.374***	0.229	1.394***	0.105	6.147***	0.145
25-29	7.373***	0.218	5.684***	0.560	1.618***	0.153	15.163***	0.359
Education (ref = primary or less)								
Secondary	–	–	1.215***	0.056	1.735***	0.239	0.582***	0.038
Higher education	–	–	0.980	0.046	1.875***	0.299	0.258***	0.021
Native language (ref = other)								
Spanish	1.525	0.337	1.073	0.140	1.962*	0.665	1.676***	0.099
Quechua	0.587*	0.132	1.361**	0.160	4.808***	1.486	1.565***	0.103
Marital status (ref = separated/divorced)								
single/never married	2.625***	0.095	0.719***	0.037	1.670	0.567	0.020***	0.001
married/in union	0.964	0.025	0.639***	0.033	1.441	0.507	1.036	0.044
Household-level characteristics								
HH size	0.923***	0.003	0.997	0.004	0.977	0.052	1.091***	0.004
Basic needs index	1.332***	0.037	0.980*	0.008	0.873	0.068	0.923***	0.008
Access to tech. index	1.896***	0.029	1.015	0.019	0.940	0.158	0.756***	0.015
Community characteristics								
Rural (ref: urban)	0.422***	0.036	1.252***	0.077	2.512**	0.836	0.780***	0.030
Observations	606,285		606,285		226,082★		310,320★★	
Pseudo R-squared	0.230		0.143		0.086		0.599	

Exponentiated coefficients; standard errors clustered at provincial level
* p<0.05 ** p<0.01 *** p<0.001
★ Sample includes only youth employed at time of census
★★ Sample includes only women

Employment is often one of the most touted benefits of mining investments by political actors (Coffey et al., 2018). Findings from Model 2 (Table 6.2) suggest youth in mining-impacted areas in 1993 had significantly *lower* odds of being employed compared to those from non-mining areas. This finding is likely associated with the lack of workers trained for mining

employment in the early 1990s in Peru, as well as the fact that large-scale mining companies predominantly hired workers from outside of local communities until the early 2000s (Baillie et al., 2020; Bury, 2005; Ponce & Mcclintock, 2014). However, this finding tells us little about the *type* of employment. In other words, what types of jobs were youth able to obtain in mining areas and did sectoral employment vary by gender and rurality? To disentangle these questions, I fit a multinomial regression model for employed youth, displayed in Table 6.3, predicting occupations that are theorized to be impacted by large-scale mining: service roles, agriculture, elementary occupations and machinery operations or trades (Bury, 2005). I compare the likelihood of working in each occupation to the likelihood of working in professional occupations (reference group).

Table 6.3: Multinomial regression of employed youth predicting occupation compared to professional occupations by exposure to large-scale mines, 1993

	(5) Agriculture, clerks, other		Machinery & trades		Elementary occupation		Service	
	Coeff.	*S.E.*	*Coeff.*	*S.E.*	*Coeff.*	*S.E.*	*Coeff.*	*S.E.*
Old mining province (pre '93)	-0.029	0.037	0.261	0.227	0.316**	0.119	0.099	0.130
Individual-level characteristics								
Gender (female)	-0.240	0.200	-1.243***	0.042	-0.157	0.190	-0.212***	0.032
Age (ref: 15-19)								
20-24	-0.540***	0.044	-0.360***	0.043	-0.712***	0.033	-0.339***	0.056
25-29	-0.980***	0.041	-0.792***	0.044	-1.301***	0.039	-0.802***	0.058
Education (ref = primary or less)								
Secondary	-2.348***	0.319	-2.002***	0.196	-2.646***	0.198	-1.742***	0.186
Higher education	-3.535***	0.480	-4.460***	0.257	-5.459***	0.280	-3.774***	0.261
Native language (ref = other)								
Spanish	0.135	0.098	-0.124	0.138	0.287	0.149	0.250	0.137
Quechua	0.441***	0.131	0.094	0.250	0.636**	0.198	0.366*	0.178
Marital status (ref = separated/divorced)								
single/never married	-0.160*	0.070	-0.340***	0.062	-0.297***	0.069	-0.503***	0.063
married/in union	-0.103	0.073	-0.194**	0.062	-0.498***	0.070	-0.222***	0.065
Household-level characteristics								
HH size	0.007	0.006	0.024**	0.009	0.028***	0.005	0.016	0.009
Basic needs index	-0.158***	0.013	0.039	0.029	-0.062***	0.012	0.026*	0.012
Access to tech. index	-0.272***	0.057	-0.197	0.145	0.052	0.075	-0.218	0.114
Community characteristics								
Rural (ref: urban)	0.543***	0.088	-1.573***	0.299	-0.099	0.156	-1.885***	0.202
Observations	226,082★							
Pseudo R-squared	0.179							

Standard errors clustered at provincial level

* p<0.05 ** p<0.01 *** p<0.001

★ Sample includes only youth employed at time of census

Employed youth in 1993 residing in provinces with large-scale mining projects were significantly more likely to have elementary occupations compared to those in non-mine provinces. A large category, elementary occupations are predominantly labor-intensive and include mining and quarrying laborers, construction laborers, and vehicle operators, among others. As predicted, compared to professional occupations, youth in 1993 were more likely to be employed in physically demanding labor roles in mining areas compared to non-mine areas. These findings from the 1993 census sample suggest that, historically, mining was not significantly beneficial for youth educational and employment outcomes.

The 1993-2007 time period was associated with a proliferation of large-scale investment in mining. In Table 6.4 below, I test whether different histories of large-scale mining were associated with youth outcomes measured in 2007. I find that youth living in new mine provinces had higher odds of completing some higher education and having a mining occupation. However, youth in new mine provinces had significantly lower odds of being employed at all. Finally, those in new mine provinces had lower odds of having migrated into the province within the past 5 years. Those living in provinces that received mines prior to 1993 continued to have lower odds of being employed, lower odds of having migrated into the province and lower odds of having a child before age 29 (among young women). Finally, those living in double mine provinces had significantly higher odds of obtaining some higher education compared to youth in non-mine provinces.

What emerges from these results from the 2007 Peruvian census is that mining activity is associated with better educational outcomes for youth, but poorer employment outcomes. Building on the mixed findings on educational attainment and attendance among children, these findings suggest that young adults in Peru exposed to mining projects are more likely to pursue higher education (Ticci & Escobal, 2014; Zabsonré et al., 2018). However, this higher educational attainment is not resulting in better odds of employment. In fact, youth in mining areas in 2007 were less likely to be employed, suggesting mines are not offering better labor-market opportunities compared to other areas. That those who do find employment in newer and double mine provinces have higher odds of working in a mining occupation is unsurprising. However, this latter finding suggests a specialization effect in mining provinces in which youth opportunities are limited to the mining sector. Finally, newer and older mines are found to be associated with lower odds of youth migration into the province, though this finding may not

capture circular or temporary migrants often associated with mining projects (Castillo &

Brereton, 2018a).

Table 6.4: Logistic regression models predicting education, employment and demographic outcomes by large-scale mine exposure in 2007

	(7) Higher Education		(8) Employed		(9) Mining Employment		(10) In-migrant		(11) Children born	
	Odds Ratio	*S.E.*	*Odds Ratio*	*S.E.*	*Odds Ratio*	*S.E.*	*Odds Ratio*	*S.E.*	*Odds Ratio*	*S.E.*
Mine province (ref = non-mine province)										
New mine province ('93 - '07)	1.335**	0.129	0.799**	0.058	5.504***	1.921	0.801*	0.087	0.890	0.062
Double mine province	2.015***	0.137	0.852	0.087	6.204**	3.980	0.959	0.104	0.868	0.067
Old mine province (pre '93)	1.115	0.112	0.781***	0.039	1.201	0.648	0.699**	0.083	0.811*	0.074
Individual-level characteristics										
Gender (female)	1.208***	0.027	0.310***	0.044	0.173***	0.019	0.985	0.040	–	–
Age (ref: 15-19)										
20-24	5.639***	0.258	3.487***	0.165	1.651***	0.154	1.077**	0.029	5.595***	0.148
25-29	7.665***	0.295	5.832***	0.381	1.992***	0.264	0.858	0.084	13.041***	0.503
Education (ref = primary or less)										
Secondary	–	–	1.419***	0.048	2.016***	0.244	1.252***	0.048	0.611***	0.013
Higher education	–	–	1.216**	0.077	2.844***	0.489	1.250*	0.135	0.306***	0.011
Native language (ref = other)										
Spanish	1.387***	0.129	0.864	0.071	3.699**	1.612	0.884	0.263	1.183*	0.095
Quechua	0.663***	0.071	0.868	0.106	4.451***	1.544	1.222	0.249	1.079	0.087
Marital status (ref = separated/divorced)										
single/never married	2.569***	0.156	0.717***	0.042	1.003	0.114	1.182**	0.062	0.012***	0.001
married/in union	1.016	0.022	0.661***	0.020	1.143	0.136	1.384***	0.039	0.411***	0.016
In-migrant	1.122	0.112	1.574***	0.061	3.650***	0.369			0.731***	0.025
Household-level characteristics										
HH size	0.941***	0.003	1.005	0.004	0.923*	0.029	0.959***	0.008	1.091***	0.009
Basic needs index	1.311***	0.035	1.035	0.031	0.627***	0.040	0.933*	0.029	0.911***	0.008
Access to tech. index	1.381***	0.041	0.917***	0.013	1.024	0.082	0.851***	0.011	0.902***	0.025
Community characteristics										
Rural (ref: urban)	0.377***	0.024	1.022	0.038	1.793	0.563	0.337***	0.036	0.858***	0.037
Observations	757,156		757,156		334,949★		757,156		380,215★★	
Pseudo R-squared	0.205		0.14		0.264		0.028		0.54	

Exponentiated coefficients; standard errors clustered at provincial level
* p<0.05 ** p<0.01 *** p<0.001
★ Sample includes only youth employed at time of census
★★ Sample includes only women

In order to further assess whether youth were more likely to be employed in different

types of occupations, Model 12 in Table 6.5 reveal the results of a multinomial regression model

predicting employment in four occupations compared to professional employment. I find that

employed youth in new-mine provinces are significantly more likely to hold an elementary

occupation compared to youth in non-mine provinces. In double-mine provinces, employed

youth are less likely to hold agricultural or other occupations compared to professional roles, and

more likely to hold jobs in machinery, trades, elementary occupations or service roles. Consistent

with previous research, this latter finding suggests that areas with long legacies of mine activity

are associated with increasingly labor intensive, transient and service occupations among youth

(Bebbington & Humphreys Bebbington, 2018; Maconachie, 2014; Vincent, 2000). Rurality and gender are significant predictors of occupation as well. Rural youth are found to be more likely to be in agricultural or elementary roles, and less likely to be in machinery/trades or service roles. Women are found to more likely to be employed in service occupations and less likely to hold agricultural jobs or machinery/trades jobs.

Table 6.5: Multinomial regression of employed youth predicting occupation compared to professional occupations by exposure to large-scale mines, 2007

	(12)							
	Agriculture, clerks, other		Machinery & trades		Elementary occupation		Service	
	Coeff.	*S.E.*	*Coeff.*	*S.E.*	*Coeff.*	*S.E.*	*Coeff.*	*S.E.*
Mine province (ref = non-mine province)								
New mine province ('93 - '07)	-0.073	0.088	0.13	0.111	0.189*	0.086	-0.025	0.077
Double mine province	-0.204***	0.050	0.377***	0.104	0.288***	0.075	0.245***	0.033
Old mine province (pre '93)	0.000	0.123	-0.136	0.075	0.052	0.192	-0.017	0.115
Individual-level characteristics								
Gender (female)	-0.387*	0.164	-1.603***	0.085	-0.069	0.039	0.266**	0.090
Age (ref: 15-19)								
20-24	-0.125*	0.059	-0.364***	0.035	-0.683***	0.035	-0.587***	0.031
25-29	-0.605***	0.092	-0.898***	0.070	-1.336***	0.078	-1.125***	0.063
Education (ref = primary or less)								
Secondary	-1.891***	0.159	-1.460***	0.055	-1.968***	0.070	-1.373***	0.050
Higher education	-3.177***	0.346	-3.643***	0.094	-4.337***	0.175	-3.371***	0.124
Native language (ref = other)								
Spanish	-0.489***	0.118	-0.066	0.175	-0.298*	0.123	-0.071	0.187
Quechua	0.013	0.161	0.252	0.257	0.183	0.213	0.111	0.241
Marital status (ref = separated/divorced)								
single/never married	-0.660***	0.131	-0.660***	0.045	-0.422***	0.079	-0.646***	0.068
married/in union	-0.090*	0.044	-0.233***	0.046	-0.377***	0.052	-0.266***	0.059
In-migrant	-0.246**	0.092	0.028	0.093	0.095	0.145	0.072	0.050
Household-level characteristics								
HH size	0.003	0.007	0.051***	0.011	0.057***	0.004	0.035***	0.009
Basic needs index	-0.185***	0.021	0.023	0.018	-0.128***	0.014	0.056***	0.017
Access to tech. index	-0.056***	0.014	-0.408***	0.043	-0.312***	0.023	-0.346***	0.030
Community characteristics								
Rural (ref: urban)	1.032***	0.166	-0.995***	0.188	0.360***	0.050	-1.264***	0.121
Observations	334,949★							
Pseudo R-squared	0.166							

standard errors clustered at provincial level

* p<0.05 ** p<0.01 *** p<0.001

★ Sample includes only youth employed at time of census

Interaction models

In prior models, gender and rurality are found to be significant predictors of youth educational, employment and demographic outcomes. In order to disentangle the impacts of mining development for young men and women and for youth from rural and urban areas, logistic regression models were fit for each outcome including interaction terms for each census sample year. No significant interactions between gender or rurality and old-mine provinces were found among the sample of 1993 youth (results not shown). This is likely attributable to the shorter exposure to large-scale mining projects, resulting in minimal differential outcomes attributable to mining between rural and urban areas and between young men and women.

Gender and rurality interactions for youth in 2007 were tested both for old-, new- and double- mine provinces, displayed in Table 6.6. While several significant interactions are found, the predicted probabilities for six interactions are calculated and discussed below. Significant interactions to be discussed in greater detail are identified in bold in Table 6.6. A significant interaction between gender and old-mine provinces is identified for higher education outcome, and between gender and new-mine provinces for mining employment. Significant interactions are found between rurality and double mine provinces for higher education, employment, and migration. Finally, significant interactions are identified between old-mine provinces and rurality for children born to women under 29.

Table 6.6: 2007 Interaction models, logistic regression

| | (13) | | (14) | | (15) Mining | | (16) | | | |
| | Higher Education | | Employed | | Employment | | In-migrant | | Children born | |
	OR	R.S.E.	OR	R.S.E.	OR	R.S.E.	OR	R.S.E.	OR	R.S.E.
Mine province (ref: non-mine prov.)										
New mine province ('93 - '07)	1.448**	0.169	0.862	0.086	5.775***	2.046	0.895	0.119	–	–
Double mine province	2.145***	0.202	0.683***	0.072	6.485**	4.284	0.992	0.119	–	–
Old mine province (pre '93)	1.176*	0.087	0.941	0.056	1.157	0.660	0.723***	0.067	–	–
Gender (female)	1.240***	0.021	0.316***	0.052	0.228***	0.029	1.012	0.038	–	–
Gender Interactions										
Mine province ('93 - '07) * Gender	0.849*	0.055	0.849	0.186	**0.511**	0.120	0.790*	0.085	–	–
Double mine province * Gender	**0.886***	0.048	**1.560***	0.334	0.631*	0.138	0.935	0.048	–	–
Old mining province * Gender	0.902	0.064	**0.669***	0.130	1.577	0.524	0.935	0.090	–	–
Psuedo r-squared	0.205		0.141		0.264		0.028			
	(17)		(18)		(19)		(20)		(21)	
Mine province (ref: non-mine prov.)										
New mine province ('93 - '07)	1.284*	(0.137)	0.720***	(0.068)	7.408***	(3.042)	0.765**	(0.064)	0.935	(0.084)
Double mine province	1.977***	(0.138)	0.823	(0.083)	4.420**	(2.348)	0.905	(0.065)	0.863*	(0.061)
Old mine province (pre '93)	1.197***	(0.063)	0.762***	(0.053)	1.565	(0.831)	0.766	(0.116)	0.893	(0.076)
Rural/urban	0.371***	(0.026)	0.959	(0.044)	2.134*	(0.775)	0.329***	(0.040)	0.922	(0.054)
Rural/Urban Interactions										
Mine province ('93 - '07) * Rural	1.205	(0.204)	1.337**	(0.142)	0.584	(0.290)	1.207	(0.309)	0.883	(0.091)
Double mine province * Rural	**1.673***	(0.373)	**1.745****	(0.309)	3.594*	(2.007)	**3.453***	(0.962)	1.409*	(0.197)
Old mining province * Rural	0.586*	(0.124)	1.115	(0.126)	0.547	(0.211)	0.451**	(0.113)	**0.745***	(0.056)
Psuedo r-squared	0.205		0.141		0.268		0.028		0.539	

Exponentiated coefficients; standard errors clustered at provincial level

All models include controls

* p<0.05 ** p<0.01 *** p<0.001

Significant interaction terms suggest a significant relationship, but coefficients of interaction terms do not lend themselves to drawing conclusions about the direction and strength of the effect in logistic regression models (Mize, 2019). Therefore, I first calculate the predicted probabilities separately for select significant interactions (indicated in bold in Table 6.6). The predicted probabilities are displayed below in Figure 6.1.

Figure 6.1: Predicted probabilities for gender and rural/urban interactions with mine provinces

Gender and mine province predicted probabilities displayed in Figure 6.1 suggest that differences in the predicted probability of higher education between women in both non-mine and double-mine provinces are significant. A similar pattern is found between urban and rural areas for higher educational outcomes. For mining employment, the predicted probabilities for men and women appear to be significantly different in non-mine provinces, but not in new-mine provinces. Predicted probabilities for youth employment and children born (among young women) reveal differences between mine and non-mine areas by rural or urban status may not be significant, given overlapping confidence intervals. In order to formally test the significance of these interaction effects, I calculate the predicted probabilities and marginal effects using Stata's *margins* command, displayed in Table 6.7 (Long & Freese, 2014).

Table 6.7: Probability of youth outcomes and gender, with test of interaction effect

Gender Interactions	Probability	AME of mine-female	Second differences
Higher education			
Double-mine province – Male	0.411***	-0.017	
Double-mine province – Female	0.428***		-0.018
Non-mine province – Male	0.282***	-0.035***	
Non-mine province – Female	0.317***		
Mining employment			
New-mine province – Male	0.058***	0.050***	
New-mine province – Female	0.008**		-0.041**
Non-mine province – Male	0.012***	0.009***	
Non-mine province – Female	0.003***		
Employed (double-mine)			
Double-mine province – Male	0.507***	0.150***	
Double-mine province – Female	0.356***		0.094*
Non-mine province – Male	0.588***	0.244***	
Non-mine province – Female	0.343***		
Employed (old mine)			
Old-mine province – Male	0.575***	0.318***	

	Probability	AME of urban-rural	Second differences
Old-mine province – Female	0.257**		-0.074
Non-mine province – Male	0.588***	0.244***	
Non-mine province – Female	0.343***		
Rural/Urban Interactions	**Probability**	**AME of urban-rural**	**Second differences**
Higher education			
Double-mine province – Urban	0.445***	0.090*	
Double-mine province – Rural	0.355***		0.058
Non-mine province – Urban	0.319***	0.148***	
Non-mine province – Rural	0.171***		
Employed			
Double-mine province – Urban	0.427***	-0.105**	
Double-mine province – Rural	0.532***		0.133**
Non-mine province – Urban	0.466***	0.009	
Non-mine province – Rural	0.458***		
Demographic Outcomes	**Probability**	**AME of urban-rural**	**Second differences**
Migration			
Double-mine province – Urban	0.149***	-0.016	
Double-mine province – Rural	0.165***		0.118**
Non-mine province – Urban	0.162***	0.010***	
Non-mine province – Rural	0.060***		
Children born			
Old mine province – Urban	0.397***	0.034***	
Old mine province – Rural	0.362***		-0.027***
Non-mine province – Urban	0.407***	0.007	
Non-mine province – Rural	0.400***		

* p<0.05 ** p<0.01 *** p<0.001

Table 6.7 reveals that five of the eight interaction effects of interest are truly significant. The difference in the probability of obtaining higher education between men and women in non-mine provinces is 3.5 percentage points, significant at the p < 0.001 level. This suggests that the gendered educational attainment gap is significantly larger in areas without mines compared to those with long histories of mining. However, the interaction effect of gender *between* double-mine and non-mine provinces is not found to be significant. Similarly, a significant difference of

9.0 percentage points for higher education between rural and urban areas is found in double mine provinces, compared to 14.8 percentage points in non-mine areas. However, the interaction effect of rural/urban status *between* double mine and non-mine provinces by rurality is not significant, suggesting educational attainment gaps by rural or urban status differ within provinces with and without mining activity but not between provinces with and without mining activity.

Employment outcomes are also found to be significantly different between youth in rural and urban areas and between young men and women in double-mine areas. The interaction effect of rural/urban status *between* double-mine areas and non-mine areas is 13.3 percentage points and is statistically significant. In other words, rural youth in provinces with long histories of mining were significantly more likely to find employment in 2007 compared to urban youth *and* compared to youth in non-mine provinces. Double-mine provinces also have significant employment differences for men and women. The difference between men and women's employment in double-mine provinces is found to be 15.0 percentage points compared to 24.4 percentage points in non-mine provinces. The interaction effect for rural/urban status *between* double-mine provinces and non-mine provinces is 9.4 percentage points. In other words, women experience substantial employment disadvantages in both mine and non-mine areas, but the employment gap between young men and women is wider in non-mine provinces. Provinces with long histories of mining do not enhance employment opportunities for young women.

A significant difference is found between men and women for mining employment as well. As evident in Figure 6.1 and as predicted, the probability of mining employment is higher in new mine provinces and among men. The difference between men and women's employment in mining in new mine provinces is found to be 5.0 percentage points, compared to 0.9 percentage point difference between men and women in non-mine provinces. The difference of

five percentage points is found for the effect of gender *between* new-mine and non-mine provinces for mining employment, statistically significant at the $p<0.05$ level.

Demographic outcomes were also found to vary significantly by geography. In non-mine areas, migration to urban areas among youth is significantly higher, a difference of 1.0 percentage points. In contrast, the difference between in-migration to rural and urban areas within double-mine provinces is not significantly different. This finding may be associated with the higher employment in rural areas associated with a long mining history in rural areas. The effect of rural/urban residence on migration *between* double-mine and non-mine provinces is also found to be significant. This finding suggests that areas in Peru with long histories of mining activity may attract youthful in-migrants to rural areas, helping to retain the vitality of rural places affected by mining (Castillo & Brereton, 2018a; Coffey et al., 2018). The probability of young women having children before age 29 varies significantly by rural/urban status and mine exposure in old-mine provinces. Overall, young women in old-mine provinces had lower predicted odds of childbearing compared to their peers in non-mine provinces. Young women in rural areas in old mine provinces had lower predicted odds of childbearing compared to young women in urban areas, a difference of 3.4 percentage points. That young women in rural areas had significantly lower predicted odds of childbearing is consistent with prior findings that adolescent fertility is on the rise in urban areas in Peru (Esteve & Florez-Paredes, 2018; Neal, Sarah; Harvey, Chloe; Chandra-Mouli, Venkatraman; Caffe, Sonja; Camacho, 2018). The interaction effect of rural/urban status *between* old-mine and non-mine province is found to be significant as well, a difference of 2.7 percentage points. As expected, young women in old-mine areas have significantly lower predicted odds of having at least one child by age 29 compared to non-mine areas, particularly if they live in rural areas. Given prior evidence that the impact of

large-scale mines and youth outcomes extend beyond provincial boundaries, I now turn to an analysis of youth well-being at the department-level.

Expanding the scale: Department-level exposure to large-scale mining projects

Results from exploratory spatial analysis in the previous chapter revealed patterns of spatial clustering that extend beyond provincial boundaries across a number of youth outcomes, particularly for mining projects developed after 1993. In fact, social and demographic spatial research has found that modifying the spatial unit can influence empirical results (Weeks, 2004). In order to test whether individual-level youth outcomes vary beyond provincial units, I fit logistic regression models for each outcome with mine exposure measured at the departmental level, and a multinomial regression model predicting occupation among employed youth. Departments represent the second level of aggregation available through IPUMS-International (Minnesota Population Center, 2020). Given prior research on the migratory impacts of mines, the impacts of large-scale mining projects are likely felt far beyond provincial and even department-level boundaries (Bebbington & Humphreys Bebbington, 2018; Bury, 2005; Castillo & Brereton, 2018b). However, by testing the impacts on youth over a larger geographical scale, I account for possible broader regional impacts of large-scale projects. Spatial clustering was found to be more strongly associated with mining among the 2007 census sample. Therefore, Table 6.8 displays the results for department-level analysis of the 2007 sample. At the department-level, newer mining projects continue to be associated with significantly better odds of higher education and lower odds of employment. The odds of mining employment among youth at the department level are high and strongly significant ($p<0.001$), suggesting a broader impact on youth in the mining sector beyond provincial boundaries. Additionally, a significant effect on youth occupation compared to professional occupations is not found for new mine

departments (Model 23). This finding, while difficult to disentangle, may suggest that employed youth in departments with newer mines in 2007 were more likely to work in the mining sector across a broader range of positions. Alternatively, this latter finding may imply that the mining sector had broader reach beyond provincial boundaries compared to different occupations. Finally, measures of demographic change suggest youth have lower predicted odds of migration into departments with newer mines and double mines, and no significant effect on young women having children is found associated with mining projects. This finding suggests that demographic behavior changes associated with large-scale mining projects are concentrated on smaller geographic scales.

Table 6.8: Logistic regression models predicting education, employment and demographic outcomes by large-scale mine exposure, department-level 2007

	(18)		(19)		(20)		(21)		(22)	
	Higher Education		**Employed**		**Mining employment**		**In-migrant**		**Children Born**	
	OR	*R.S.E.*	*OR*	*R.S.E.*	*OR*	*R.S.E.*	*OR*	*R.S.E.*	*OR*	*R.S.E.*
New mine department ('93 - '07)	1.388*	0.178	0.776***	0.047	7.653***	2.119	0.481***	0.086	0.876	0.116
Double mine department	1.241	0.186	0.826*	0.068	2.437	1.355	0.633**	0.096	0.875	0.063
Old mine department (pre '93)	1.111	0.168	1.133	0.072	0.245*	0.139	0.724	0.163	0.955	0.060
Pseudo r-squared	0.203		0.14		0.253		0.035		0.54	
N	757,156		757,156		334,949★		757,156		380,215★★	

Multinomial regression model preidcting occupation by large-scale mine exposure, department-level 2007

	(23)							
	Agriculture, Clerks, Other		**Machinery & trades**		**Elementary occupation**		**Service**	
	Coeff.	*S.E.*	*Coeff.*	*S.E.*	*Coeff.*	*S.E.*	*Coeff.*	*S.E.*
New mine department ('93 - '07)	-0.084	0.106	0.086	0.117	0.14	0.144	-0.019	0.066
Double mine department	-0.025	0.138	0.137	0.136	0.295*	0.126	0.066	0.087
Old mine department (pre '93)	-0.165	0.117	-0.480***	0.131	-0.613***	0.125	-0.052	0.096
Pseudo r-squared	0.166							
N	334,949★							

Standard errors clustered at department level

All models include controls

* p<0.05 ** p<0.01 *** p<0.001

★ Sample includes only youth employed at time of census

★★ Sample includes only women

Chapter synthesis

The results of analyses presented in this chapter suggest that the impact of large-scale mining projects is beneficial for youth educational outcomes, but limited in terms of providing additional employment opportunities. Furthermore, differential youth outcomes are found in

mining areas across axes of gender and rurality, particularly in areas with multiple mines and newer mining areas. Finally, the higher educational benefits and employment limitations associated with mines at the province-level are found to extend to departments, suggesting broader implications of mining activity for youth in an economically mining-dependent state.

At the start of the mining boom, open-door policies to facilitate large-scale mining investments in Peru were touted for the presumed economic growth and labor-market activity (Bebbington et al., 2008; Bury, 2005; Ponce & Mcclintock, 2014). However, I find that youth in 1993 residing in provinces that already had histories of large-scale mining activity had lower odds of employment overall. Employed youth in 1993 were more likely to be employed in elementary occupations compared to professional occupations, suggesting a degree of precarity and physically demanding labor-market opportunities in mining areas. However, outcomes among youth in mining areas in 1993 did not significantly vary by gender and rural/urban status, suggesting the gendered and geographic impacts found to be associated with mining activity were minimal prior to the subsequent mining boom. In contrast to DD models presented in Chapter 5, individual-level evidence suggests that youth in mining areas in 1993 were already experiencing an economic disadvantage in terms of finding employment. Such evidence runs counter to the paradigm of job growth pervasive in the political economy of mining, but is consistent with prior work demonstrating limitations for local economic benefits of mines in Peru and elsewhere (Gamu et al., 2015; Ponce & McClintock, 2014). In other words, at the start of the large-scale mining boom in Peru, the country's largest and most vulnerable demographic group had not benefitted economically or educationally from prior exposure to mining projects.

Youth sampled 15 years after the mining boom began in Peru experienced higher predicted odds of obtaining higher education, but lower odds of employment in provinces that

received mining projects. This finding suggests that youth are more likely to obtain higher education in mining areas, but encounter limited employment opportunities to meet their professional skill in mining-impacted areas. Higher educational outcomes for youth appears to be a key benefit associated with the arrival of large-scale mining projects, as more young people access higher education and fewer obtain only a secondary-level education or less. This finding is consistent with prior research on the educational influence of mining from Peru and around the world (Ticci & Escobal, 2014; Zabsonré et al., 2018). As expected, in provinces with long histories of mining, youth that *do* find employment have significantly higher odds of employment in the mining sector and elementary occupations, associated with increasingly tenuous and precarious labor conditions (Bebbington & Humphreys Bebbington, 2018; Bury, 2005). In a political economic context in which opportunities for gainful, professional employment among youth are demonstrably low, the impact of Peru's economic growth strategy by way of extraction has done little to remedy the glut of qualified young people that cannot find employment (OECD, 2017; Wolseth & Babb, 2008). Instead, while large-scale mining activity is associated with improved higher educational attainment among youth, professional training and education is mismatched with local employment opportunities (OECD, 2017).

Educational and employment outcomes in mining areas among youth in 2007 are found to vary by gender and geography. Consistent with prior research in Peru, women had higher predicted odds of higher education compared to young men in both mine and non-mine areas (Guerrero & Rojas, 2020). A persistent gender education gap is identified in non-mine areas but not in mine provinces, suggesting mining may be associated with minimizing the gender gap in higher education. The mechanisms through which women's educational attainment is enhanced in mining areas but not in non-mine areas is unclear and warrants further research. For this study,

I conceptualize higher education attainment in mining provinces and departments within Sen's (1999) capabilities framework. As large-scale mining projects shift local economies and opportunity structures within a broader political economy oriented toward mining, young women experience a broadening educational landscape to reach their aspirations. On the other hand, young women had significantly lower odds of mining employment in new mining areas, and significantly lower odds of being employed in double-mine provinces, suggesting educational attainment for young women does not translate into closing the employment gap. In other words, national economic gains, local socioeconomic changes, and a broader social shift of valuing women's education has resulted in broader capabilities for young women in the form of higher education. However, such gains are not translating into work within the mining industries themselves. This finding is consistent with previous research of "mining masculinity" in which women are excluded from mining occupations (Segerstedt & Abrahamsson, 2019, p. 617). Thus, while mining is associated with closing the educational gap between men and women, such training is not necessarily translating into better overall well-being in the form of career opportunities *within* provinces with large-scale mining activity.

Finally, I find youth in rural and urban areas to face distinct outcomes in mining areas compared to non-mine areas. In provinces that both had a mine pre-1993 and received a mine after 1993, youth in rural areas had significantly higher odds of higher education compared to their rural peers in non-mine provinces, and significantly higher odds of employment compared to their urban peers in double-mine provinces. Unlike for men and women, provinces with long histories of mining were not associated with minimizing the educational attainment gap between rural and urban youth. On the other hand, rural youth in double-mine provinces had broader opportunities for employment compared to their urban peers and peers in non-mine provinces.

Thus, mining is associated with enhanced capability development in the form of employment for rural youth (Sen, 1999). This finding may be attributable to enhanced opportunities for more precarious, transient and physically demanding labor the operationalization of employment as work in the past week (for pay or not for pay) (Bury, 2005).

Finally, contrary to my prediction, young rural women in old-mine provinces were found to have significantly lower predicted probability of bearing a child before age 29 compared to rural women in non-mine provinces. Diverging from early work identifying higher fertility in rural areas impacted by extractive industries, evidence from this study suggests young women impacted by extractive industries are *less* likely to have a child in their youth. This finding is consistent with research that fertility rates among urban youth in Peru are on the rise despite educational gains, as well as work in Zambia that found lower rates of risky sexual behaviors among youth in mining areas (Esteve & Florez-Paredes, 2018; Neal et al., 2018; Wilson, 2012).

To summarize, a key benefit associated with large-scale mining activity in the Peruvian context for youth has been higher educational gains. Rural youth are more likely to study some or complete a higher education degree in mining areas, particularly those that have long histories of mining (pre- and post-1993). The difference in predicted odds for men and women attending higher education in mining areas is not significant, suggesting places with longer histories of mining are associated with closing the educational gender gap. However, educational gains in mining areas are not met with higher odds of employment for young people. This may be attributable to a specialization effect in mining areas in which jobs and services are all oriented around the mining industry (Tallichet, 2014). Youth who obtain higher educational degrees that are not mining oriented may be less likely to obtain positions in their home provinces. Thus, consistent with existing evidence, large-scale mining activity is not necessarily associated with

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localized employment (Gamu et al., 2015; Ponce & McClintock, 2014). From a political economy standpoint, large-scale mining activity in Peru has been associated with national-level economic gains. Such gains are felt locally for youth in the form of higher educational attainment in mining areas, but has not translated into jobs for youth in mining contexts.

Chapter 7 – Contemporary youth experiences of well-being decades after Peru's mining boom

Research Question(s) 3: Do lived experiences, aspirations and perceptions of mining among youth vary by whether or not they grew up around large-scale mines?

a. How do youth describe their lived experiences and aspirations for the future?

b. What factors do youth identify that constrain or enable them to reach their aspirations?

c. What perceptions and opinions about large-scale mining do youth in Peru hold?

d. In what ways do the lived experiences, aspirations and perceptions of mining vary by gender and rurality among youth in Peru?

In previous chapters, I found that youth well-being was impacted by large-scale mining developments. Specifically, large-scale mining projects were found to have educational benefits and employment disadvantages for youth 15 years ago and that these impacts were clustered differentially across geographic space. While insightful, the previous chapters are limited in two important ways: First, youth outcomes from 2007 may not reflect contemporary youth outcomes, as three decades have passed since the start of the large-scale mining boom in Peru. Secondly, survey questions available through census samples are limited, leaving much of the lived experiences of youth in mining areas poorly understood. For example, how do youth themselves perceive the impacts of large-scale mining in their country? What are their lived experiences and does the broader political economy of an extractive state influence their future aspirations? Previous research demonstrates that youth in Peru are strongly encouraged to obtain a higher education, seen as a pathway out of poverty (Ames, 2013). As indicated in prior research and in previous chapters for this study, large-scale mining investments improve the odds of youth educational attainment (Hinojosa, 2013; Zabsonré et al., 2018). However, young adults face

difficult and uncertain employment prospects, despite educational gains (Corbett & Forsey, 2017; OECD, 2017). Indeed, analysis of secondary data demonstrates that the mining boom of the 1990s and early 2000s was not associated with improved employment for youth in mining areas. What remains unknown is whether youth well-being has improved over time since 2007.

In order to offer a contemporary lens through which to assess the impacts of large-scale mining on youth well-being, I draw from independently collected survey data and in-depth, semi-structured interview data to answer five interconnected research questions. These questions ask whether, how and in what ways large-scale mining influences youth experiences, aspirations and opinions about mining. In addition, I ask whether experiences and aspirations vary by context (rural/urban, proximity to mines), gender, and ethnicity. Youth aspirations, experiences, and perceptions of mining offer a lens through which to better understand youth capabilities within the political economy of a mineral extraction state (Sen, 1999). As such, I avoid employing youth as objects acted upon by broader political economic forces, or as rhetorical tools in political disputes about mining (Coffey et al., 2018). Aspirations in particular reflect youth values, hopes, and the ability to act within physical and contextual constraints, and are thus a key lens through which to capture youth well-being (Crivello, 2015; McGregor, 2007). Given prior research and findings from previous chapters, I expect youth to have higher educational outcomes and aspirations in mining areas, but divergent occupational outcomes by gender and proximity to mining. In what follows, I describe key findings from surveys conducted with 387 individuals, as well as from twelve in-depth interviews in order to elucidate the contemporary experiences of Peruvian youth. Cognizant of the limitations of data collected virtually, these results speak to the sample of youth included, and should not be considered generalizable. Nevertheless, survey respondents and interview participation spanned the entire country, as

displayed in Figure 7.1. Representation from Peru's diverse geographical regions, rural and urban areas, and from North to South offers modern and novel insight into the lived experiences, perceptions, and aspirations of Peruvian youth.

Figure 7.1: Provinces represented by survey respondents (unweighted sample)

Descriptive Statistics

Tables 7.1-7.3 below display descriptive statistics for the survey sample. Table 7.1 displays how survey weights affected the proportion of respondents in mining and non-mining provinces in order to more closely reflect the national population of youth (Valliant & Denver, 2018). Mining provinces are defined as those that have a large-scale mine located within provincial boundaries according to the Ministry of Energy and Mines (MINAM, 2021). Most notably, the survey weights account for a higher response rate from women and youth studying

higher degrees. Participants who reported always having lived in the same place are considered

"non-migrants", all others are considered migrants. Of those who had migrated, a third moved

within the past three years and nearly 70% moved within the past 10 years. All subsequent

results draw from the weighted sample.

Table 7.1: Survey participant demographics in mining and non-mining provinces, proportions in weighted vs unweighted sample

Variable	Mining Provinces		Non-mining Provinces	
	Unweighted	*Weighted*	*Unweighted*	*Weighted*
Current situation				
Finishing high school	0.00	0.00	0.01	0.02
Employed - full-time, part-time or seasonally	0.26	0.22	0.27	0.25
Studying - university or technical institute, full-time or part-time	0.50	0.50	0.51	0.51
Mixture of employment and studying	0.17	0.23	0.16	0.20
Neither employed or studying	0.07	0.04	0.05	0.03
Aspirations - 1 year				
Employment	0.75	0.76	0.71	0.63
Higher Education	0.28	0.27	0.36	0.44
Family	0.05	0.04	0.03	0.04
Other	0.20	0.19	0.16	0.18
Aspirations - 5 years				
Employment	0.75	0.75	0.71	0.70
Higher Education	0.08	0.08	0.16	0.20
Family	0.13	0.10	0.12	0.11
Other	0.34	0.31	0.31	0.28
Demographics				
Male	0.38	0.43	0.37	0.47
Female	0.62	0.57	0.63	0.53
Age				
18 - 19	0.19	0.24	0.23	0.28
20 - 25	0.47	0.46	0.48	0.51
26 - 31☆	0.34	0.30	0.25	0.21
Education				
Less than secondary	0.01	0.03	0.01	0.03
Completed secondary	0.28	0.48	0.32	0.55
Technical institute (complete or incomplete)	0.12	0.14	0.07	0.09
University (complete or incomplete)	0.60	0.35	0.59	0.32
Marital status				

Single	0.80	0.82	0.82	0.81
Married, cohabiting	0.19	0.17	0.18	0.19
widowed/divorced/separated	0.01	0.00	0.00	0.00
Migrant status				
Non-migrant	0.59	0.58	0.77	0.79
Migrant	0.41	0.42	0.23	0.21
Race (Mestizo)				
Mestizo	0.77	0.87	0.80	0.86
Other	0.23	0.13	0.20	0.14
Urban	0.64	0.63	0.67	0.65
Rural	0.36	0.37	0.33	0.35
Total Participants	104		283	

☆ 5 participants aged 31 at the time of the survey were included in analysis due to low response rate

In addition, in order to discern possible differences in youth experiences, perceptions and aspirations by gender, geography and exposure to mines, the proportion of youth in mine and non-mine areas by gender (Table 7.2) and rural/urban residence (Table 7.3) for key outcomes are displayed below. A higher proportion of young women are found to be currently studying at the time of the survey compared to young men, both in mining and non-mining areas. A higher proportion of young women in mining areas both study and work compared to young men and to their peers in non-mining areas. Very few young people are neither employed nor studying, with the highest proportion (0.05) among young men in mining areas. A larger proportion of men and women in non-mining areas are employed, primarily in full-time or seasonal positions. More young men and women in mining provinces aspire to be employed in a year compared to those in non-mining areas. Finally, a larger share of men in non-mining areas aspire to higher education in five years compared to young women and men in non-mining areas.

Table 7.2: Descriptive statistics by gender (weighted sample)

	Women		Men	
	Mine	**Non-mine**	**Mine**	**Non-mine**
	Proportion	*Proportion*	*Proportion*	*Proportion*
Current situation				
Finishing high school	0.00	0.01	0.00	0.03
Employed - full-time, part-time or seasonally	0.14	0.24	0.03	0.27
Full-time	0.09	0.11	0.19	0.11
Part-time	0.02	0.02	0.07	0.04
Seasonal	0.04	0.10	0.08	0.11
Studying - university or technical institute, full-time or part-time	0.55	0.56	0.44	0.45
University full-time	0.42	0.48	0.34	0.34
University part-time	0.12	0.07	0.05	0.08
Technical Institute full-time	0.00	0.01	0.00	0.02
Technical Institute part-time	0.01	0.00	0.05	0.01
Mixture of employment and studying	0.27	0.19	0.18	0.21
Neither employed nor studying	0.04	0.01	0.05	0.04
Aspirations - 1 year				
Employment	0.78	0.63	0.73	0.64
full-time	0.23	0.29	0.42	0.37
part-time	0.36	0.22	0.33	0.25
seasonally	0.20	0.16	0.01	0.08
Higher Education	0.34	0.49	0.17	0.38
University	0.32	0.45	0.17	0.36
Technical Institute	0.03	0.04	0.00	0.02
Family	0.05	0.02	0.04	0.07
Other	0.17	0.13	0.21	0.24
Aspirations - 5 years				
Employment	0.76	0.72	0.75	0.67
full-time	0.53	0.54	0.60	0.44
part-time	0.26	0.17	0.14	0.27
seasonally	0.02	0.07	0.02	0.04
Higher Education	0.03	0.16	0.14	0.24
University	0.03	0.48	0.14	0.21
Technical institute	0.00	0.05	0.00	0.05
Family	0.11	0.10	0.08	0.11
Other	0.36	0.30	0.24	0.27
N	64	177	40	106

Descriptively, number of notable differences are evident between those from rural and urban areas among surveyed youth. Fewer youth are currently employed in rural areas compared to those in urban areas. A larger share of rural youth in the sample are currently in higher educational settings compared to those in urban areas, though a slightly higher share is in technical training schools or studying part-time. A higher proportion of youth from rural areas are simultaneously studying and employed compared to those from urban areas, consistent with prior findings by Guerrero and Rojas (2020) that rural youth are more likely to have work to fund their higher educational pursuits. In terms of aspirations, a higher proportion of those from urban mining areas reported aspiring to be employed within a year compared to youth in urban non-mining provinces and compared to rural youth. Part-time employment was the most selected employment aspiration among urban youth in mining areas. The majority of respondents reported aspirations to be employed in five years, though a higher proportion of youth from rural non-mining areas reported higher education aspirations in five years compared to their urban and rural mining area peers.

Table 7.3: Descriptive statistics by rural/urban status (weighted sample)

	Urban		Rural	
	Mine	**Non-mine**	**Mine**	**Non-mine**
Current situation	*Proportion*	*Proportion*	*Proportion*	*Proportion*
Finishing high school	0.00	0.02	0.00	0.01
Employed - full-time, part-time				
or seasonally	0.25	0.29	0.18	0.18
Full-time	0.16	0.14	0.08	0.06
Part-time	0.05	0.05	0.01	0.00
Seasonally	0.04	0.10	0.08	0.12
Studying - university or technical				
institute, full-time or part-time	0.49	0.47	0.53	0.57
University full-time	0.37	0.42	0.40	0.40
University part-time	0.11	0.05	0.07	0.13
Technical Institute full-time	0.00	0.00	0.00	0.03
Technical Institute part-time	0.01	0.00	0.06	0.01
Mixture of employment and				
studying	0.21	0.18	0.26	0.22
Neither employed or studying	0.04	0.03	0.04	0.02
Aspirations - 1 year				
Employment	0.82	0.66	0.65	0.59
full-time	0.26	0.33	0.39	0.31
part-time	0.43	0.21	0.20	0.28
seasonally	0.15	0.14	0.07	0.10
Higher Education	0.20	0.42	0.39	0.48
University	0.20	0.40	0.35	0.43
Technical Institute	0.00	0.02	0.04	0.05
Family	0.05	0.05	0.03	0.02
Other	0.21	0.17	0.16	0.19
Aspirations - 5 years				
Employment	0.76	0.72	0.74	0.66
full-time	0.56	0.55	0.56	0.38
part-time	0.23	0.16	0.18	0.33
seasonally	0.03	0.04	0.01	0.08
Higher Education	0.05	0.17	0.13	0.24
University	0.05	0.15	0.13	0.23
Technical institute	0.00	0.03	0.00	0.05
Family	0.07	0.10	0.15	0.12
Other	0.36	0.30	0.22	0.25
N	67	191	37	92

Finally, Table 7.4 displays the descriptive statistics for the twelve in-depth interview participants. All names are pseudonyms to protect participant anonymity. In total, six young men and six young women participated in a virtual interview. Four participants are from provinces impacted by large-scale mining projects and three are from rural areas. Participants lived from the northern- to the southern-most regions of Peru, representing the coast, Andean region, and the jungle. The majority of participants were from urban centers but only one resided in the capital city (Lima). Two participants resided in peripheral communities or human settlements (*asentamientos humanos* in Spanish). In Peru and elsewhere, human settlement communities are associated with high levels of poverty, crime, and a lack of services to meet basic needs, such as water or electricity (Winchester, 2005). While no individual experience can be generalized to larger populations or sub-populations, interview participants for this study offer deeper understanding of a wide variation of youth experiences in the Peruvian context.

Table 7.4: Interview participant descriptive statistics

Pseudonym	Age	Gender	Mine province	Rural/urban
Maria	29	F	Yes	Rural
Cyntia	19	F	Yes	Urban
Valeria	19	F	Yes	Urban
Barbara	18	F	No	Urban
Karla	26	F	No	Urban
Zoila	23	F	No	Urban
Juan	27	M	Yes	Rural
Alberto	21	M	No	Rural
Carlos	25	M	No	Urban
Hector	21	M	No	Urban
Javier	22	M	No	Urban
Jose	23	M	No	Urban

Youth outcomes and aspirations: evaluating associations with proximity to mines

In order to assess whether the lived realities and aspirations of youth from mining areas and non-mining areas significantly differ within this sample of youth, I first fit a multinomial logistic regression predicting participant's current situation (work, higher education, other) by whether or not they reside in a province with a large-scale mining project, shown in Table 7.5. The model predicts whether youth in mining areas were significantly more likely to be working or studying compared to the baseline category, "other" (finishing secondary schooling, mixture of work and school, or neither working or studying). Controls include age, gender, race, marital status, education, whether or not a young person has migrated in their lifetime and rural/urban status. The significant F-statistic for the multinomial model affirms model fit. Whether or not youth live in a province with a large-scale mining project is not found to be a significant predictor a young person's current situation, suggesting the influence of large-scale mining projects at the provincial scale does not play a role in predicting whether youth are currently working or studying in this sample of youth. Gender and urbanicity are also not found to be significant predictors of employment or study. Subsequent models including interaction terms for gender and rural status (not shown) were not found to be significant. However, insights from interviews reveal variation in the *type* of work and topic of study between mining and non-mining areas, elaborated in more detail below.

Table 7.5: Multinomial logistic regression predicting current employment/study status by residence in a mining province

	Employed		Studying	
	Coeff.	*S.E.*	*Coeff.*	*S.E.*
Mining province	-0.631	0.416	0.105	0.447
Gender (female)	0.005	0.405	0.164	0.356
Age in years	0.181**	0.063	-0.193**	0.070
Marital status (single)	0.159	0.491	0.313	0.523
Race (Mestizo)	0.956*	0.426	0.137	0.437
Education (some higher ed)	0.871	0.543	-0.723	0.373
Non-migrant	0.171	0.434	0.312	0.387
Urban (vs rural)	0.248	0.489	-0.063	0.386
F-statistic	5.86***			
N	387			

Baseline category includes individuals working and studying, neither working *nor* studying, or those finishing secondary studies

In addition to one's current educational/employment status, youth aspirations speak to their current values, intentions and expectations for the future (Crivello, 2015). As such, aspirations offer a lens through which the broader political economy is perceived by way of youth expectations. Therefore, I test whether youth aspirations in one- and five-years differ by proximity to large-scale mining projects. Tables 7.6 and 7.7 display results for four logistic regression models predicting the odds of youth aspiring to be employed, pursue higher education, start/care for family, or other aspirations in one- (Table 7.6) and five-years (Table 7.7). The F-statistic of model fit reveals that only four models are statistically significant: employment and higher education aspirations in 1 year, family and other aspirations in 5 years. This suggests that only results from these four models are appropriate for interpretation. What emerges from these models is that young people in mining areas have lower predicted odds of reporting higher educational aspirations in one year, controlling for age, education, gender and rurality. In other words, those who reside in provinces with large-scale mines are less likely to

report aspirations to study full- or part-time at either a university or technical institute a year later. This may be attributable to the fact that over 70% of those residing in mining areas were currently studying at the time of the survey and may be completing their studies in the near future. However, it may also imply that participants from mining areas are less likely to aspire to tertiary education, such as Masters or PhDs.

Table 7.6: Logistic regression predicting aspiration in 1 year

	Employed Odds Ratio	S.E.	Higher Education Odds Ratio	S.E.	Family Odds Ratio	S.E.	Other Odds Ratio	S.E.
Mining province	1.793	(0.590)	0.433*	(0.148)	0.748	(0.473)	0.904	(0.295)
Gender (female)	1.206	(0.358)	1.499	(0.448)	0.599	(0.374)	0.539	(0.182)
Age in years	1.084	(0.055)	0.867*	(0.050)	1.095	(0.120)	0.998	(0.058)
Marital status (single)	2.269*	(0.802)	0.745	(0.310)	0.783	(0.633)	0.773	(0.326)
Race (Mestizo)	0.612	(0.243)	1.417	(0.546)	2.338	(2.394)	2.037	(1.024)
Education (some higher ed)	1.378	(0.425)	0.493*	(0.154)	1.175	(0.820)	1.541	(0.655)
Current situation (ref: finishing secondary, unemployed or not studying)								
Employed	2.837	(1.767)	0.195**	(0.113)	0.489	(0.458)	0.790	(0.587)
Studying higher degree	1.934	(1.158)	0.338*	(0.172)	0.294	(0.358)	0.628	(0.446)
Mixture of work and study	0.974	(0.625)	0.412	(0.232)	0.488	(0.557)	2.056	(1.490)
Non-migrant	1.040	(0.342)	0.698	(0.230)	0.555	(0.327)	0.590	(0.200)
Urban (vs rural)	1.402	(0.429)	0.778	(0.234)	1.668	(1.228)	0.830	(0.312)
F-statistics	1.96*		3.71***		1.06		1.41	
N	387		387		387		387	

Note: Standard errors in parentheses, all models include survey weights
Significance: * $p<0.05$ **$p<0.01$ *** $p<0.001$

Table 7.7: Logistic regression predicting aspiration in 5 years

	Employed Odds Ratio	S.E.	Higher Education Odds Ratio	S.E.	Family Odds Ratio	S.E.	Other Odds Ratio	S.E.
Mining province	1.375	(0.447)	0.246**	(0.116)	0.779	(0.325)	1.126	(0.339)
Gender (female)	1.197	(0.356)	0.470*	(0.179)	1.129	(0.462)	1.496	(0.429)
Age in years	1.031	(0.055)	1.059	(0.069)	0.980	(0.060)	0.960	(0.055)
Marital status (single)	1.232	(0.422)	1.447	(0.771)	1.043	(0.477)	0.651	(0.216)
Race (Mestizo)	0.770	(0.300)	1.860	(0.917)	1.361	(0.753)	1.402	(0.530)
Education (some higher ed)	1.148	(0.424)	0.555	(0.258)	2.627	(1.654)	1.360	(0.517)
Current situation (ref: finishing secondary, unemployed or not studying)								
Employed	0.951	(0.605)	1.355	(1.347)	1.296	(1.164)	0.713	(0.450)
Studying higher degree	2.786	(1.754)	2.003	(1.891)	0.295	(0.286)	0.275*	(0.168)
Mixture of work and study	0.858	(0.564)	3.221	(3.127)	0.268	(0.250)	0.739	(0.475)
Non-migrant	1.289	(0.403)	0.441	(0.185)	0.560	(0.229)	0.864	(0.256)
Urban (vs rural)	1.444	(0.460)	0.530	(0.220)	0.399*	(0.184)	1.342	(0.416)
F-statistics	1.21		1.45		3.49***		2.05*	
N	387		387		387		387	

Note: Standard errors in parentheses, all models include survey weights
Significance: * p<0.05 **p<0.01 *** p<0.001

Qualitative evidence from those interviewed in mining areas offers additional insight into this finding. Of the four participants from mining areas, three young women were currently studying and one had completed a degree in international business. When asked about their future goals, only Cyntia claimed she would like to pursue a PhD, hoping to earn a scholarship that would allow her to study in Lima or abroad. Juan, Maria and Valeria explained wanting to move forward with their careers and families. All three described ideals of working in public institutions that served their communities. For example, Juan and Maria explain:

> *"In the future I have planned to be an authority here in my town, no? I can be the mayor or something like that, no?"* - Juan, 27, Male, Rural, Mining province

> "*This is my vision, no? That when I can finish my degree [in administration and public management], I can keep doing what I like, no? And what I want is to be able to help my population somehow. My population and, above all, my country, no?* -Maria, 29, Female, Rural, Mining province.

On the other hand, Valeria explains that she has thought about studying for a Master's degree, but it would depend on whether or not she could get a scholarship. However, when asked specifically about what she hopes for the future, she explains:

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"I would like… after helping my family, obviously. Because I have two younger brothers, so, according to the agreements within my home……….. I'm studying with a scholarship, so, I hope, I have good labor prospects. And maybe, yes, in the future I would like to start a family. Yes, it's in my plans…

…I would like to work in my municipality, and if not, maybe I would work in immigrations" -Valeria, 19, Woman, Urban, Mining province.

In contrast, those from provinces without large-scale mines described plans to pursue tertiary education (4), begin and/or complete their university education (3), and one young man, Carlos, hoped to find a good job that would allow him time to pursue his hobbies. In sum, qualitative evidence suggests youth aspirations to pursue tertiary degrees are less likely in mining areas, though few significant differences in the lived experiences and aspirations of youth between mine and non-mine provinces were identified through survey data. However, proximity to mines may be associated with variable opinions of mining. Therefore, I now turn to an analysis of how youth perceive the impacts of mining in their communities and country.

Youth perceptions of mining

How youth perceive the impacts of large-scale mining developments in their country speaks to their understanding of the broader political economic context in which they live their lives. Youth experiences are embedded in the economic, political, and social circumstances of their time (Polanyi, 1957; Wolseth & Babb, 2008). The meaning young people make out of their reality reflects how the political economy is accepted and contested (Gough & McGregor, 2017). In addition, integrating individual youth perceptions of mining into a study of the impacts of large-scale mines acknowledges youth agency to define the impacts of mining as they experience it (Coffey et al., 2018; Sen, 1999). On the survey instrument, youth responded to two main questions related to their perceptions of mining on the virtual survey. First, they were asked to

rank the social, environmental and economic impacts of large-scale mining from mostly bad to mostly good. Second, youth were asked if they had noted a range of positive and negative changes in their communities, including population change, increased or decreased crime, more or less employment opportunities for youth, better or worse infrastructure, etc. Related to the first question, Figure 7.2 below displays the average score from 1-4 of youth's perceptions of the social, economic and environmental impacts of mining between those who lived in mining provinces and those who did not. Youth from this sample perceive the economic impacts of mines to be positive on average, and hold negative perceptions on average of mining's social and environmental impacts.
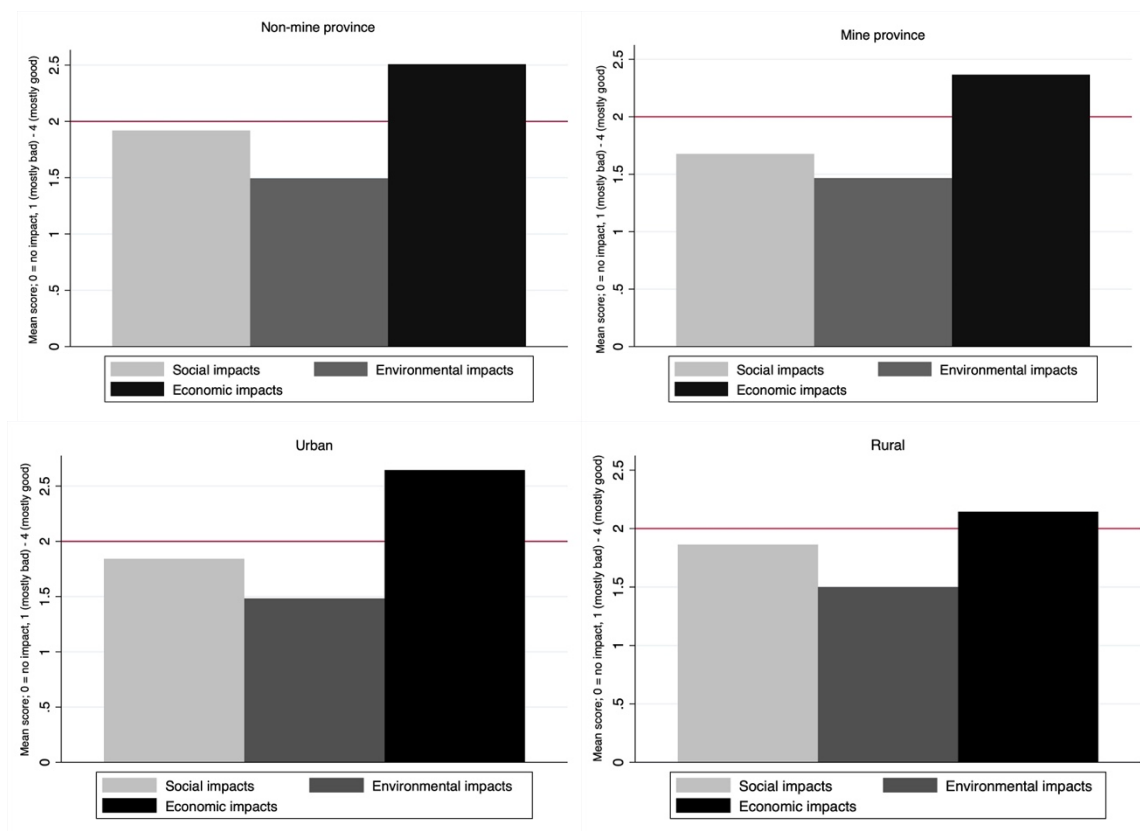

Figure 7.2: Perceptions of the social, economic and environmental impacts of mines

Chi-squared tests reveal significant differences in the perceived economic and environmental impacts of mines between those from rural and urban areas, but not between mine- and non-mine provinces. Those from urban areas had more positive perceptions on average of the economic benefits of mines and more negative perceptions of the environmental impacts compared to those from rural areas. This finding is consistent with previous findings that youth who live in rural areas are more likely to live in proximity to a mine and less likely to experience economic benefit (Bury, 2005; Steel, 2013; Vincent, 2000). However, while chi-squared tests divulge whether perceptions of mining differ significantly between two groups, they do not evaluate the strength of the relationship between predictor variables and perceptions of mining, nor do they account for survey weights applied in prior analysis (Rao & Scott, 1981). Therefore, the results of three ordinal logistic regression models are displayed in Table 7.8 below. Each mining impact was measured on a scale of 1 - 3, with 1 = negative perceptions, 2 = no impact, and 3 = positive perceptions. Because not all participants responded to questions about the perceived impacts of mining, the total number of participants is lower than in prior analysis (N = 353). In addition, two additional control variables are included that are hypothesized to be associated with perceptions of mining: 1) whether or not the respondent has a family member that works for a mine (94%) and 2) whether or not the respondent themselves works for a mine (3%).

Table 7.8: Ordered logistic regression predicting perceptions of mining impacts

	(1) Social Impacts		(2) Environmental Impacts		(3) Economic Impacts	
	OR	SE	OR	SE	OR	SE
Mining province	0.858	(0.253)	1.652	(0.897)	0.432*	(0.153)
Gender (female)	1.580	(0.432)	1.576	(0.735)	1.503	(0.457)
Age in years	0.810***	(0.047)	0.840*	(0.064)	0.903*	(0.046)
Marital status (single)	0.725	(0.252)	0.485	(0.244)	0.793	(0.295)

Race (Mestizo)	0.736	(0.231)	0.507	(0.255)	1.239	(0.417)
Education (some higher ed)	1.274	(0.399)	0.828	(0.408)	1.104	(0.376)
Current situation (ref: Other)						
Employed	2.383*	(0.998)	1.399	(0.869)	2.753*	(1.304)
Studying higher degree	0.472*	(0.178)	0.265**	(0.134)	0.915	(0.321)
Wants to stay in community	1.202	(0.343)	0.814	(0.319)	1.088	(0.323)
Family member works for mine	0.482	(0.243)	0.959	(0.831)	0.101*	(0.099)
Works for mine	0.685	(0.504)	1.789	(1.884)	0.572	(0.425)
Migrant	1.026	(0.296)	0.699	(0.352)	2.496**	(0.860)
Urban (vs rural)	0.671	(0.189)	0.186***	(0.078)	2.657**	(0.829)
cut1	0.003***	(0.004)	0.012*	(0.023)	0.008**	(0.013)
cut2	0.006***	(0.009)	0.030	(0.057)	0.018*	(0.031)
N	353		353		353	
F	2.179*		3.088***		3.093***	

Note: Exponentiated coefficients, standard errors in parentheses, all models include survey weights
Significance: * p<0.05 **p<0.01 *** p<0.001

Results of ordered logistic regression models suggest that those in mining provinces hold significantly different opinions about economic impacts of mines compared to those in provinces without large-scale mining projects. Specifically, living in a mining province reduces the odds of reporting more favorable perceptions of the economic impacts of mining by a factor of 0.43, holding all other variables constant. Conversely, living in an urban area or having migrated into the province where you currently reside are associated with increased odds of reporting more favorably on the economic impacts of mines.

Interview data offer additional nuance to results from the descriptive and regression analyses. With the exception of Maria, all interview participants described mining as economically beneficial for the country. However, every participant was quick to point out that mining causes environmental harm and social conflict. Interviewees often distinguished between informal or artisanal mines and large-scale mining projects, describing that the environmental damage from informal or illegal mining is much worse than that of large-scale mines. This

understanding of harm related to small-scale, artisanal mining reflects an acceptance of the

hegemonic economic development model associated with large-scale mining endeavors, despite

evidence that smaller-scale mining projects offer more direct, localized economic benefits

(Pokorny et al., 2019; Sovacool, 2019). Nonetheless, participants often pointed out that the long-

term implications of extraction in their country was unknown. In addition, participants were

aware of the social conflict around mines. Some, like Juan, seemed sympathetic to the concerns

of rural populations protesting mining projects.

> *So, there are always clashes between the local population with the police or private mine security and you always see... they show mistreatment, no? From them onto the local people. The locals blame the mine for taking over their land and the mine says that they are the owners so that causes fights. Sometimes there are even deaths. Every year there are always protests over there. So I think, as for impacts, I don't see many good ones. There is money going to the municipalities that is called the mining cannon, but you don't see the authorities taking advantage of it. So, all of that has made the mine, like I said, I believe the benefit is small.* -Juan, 27, Man, Rural, Non-mine province

Like Juan, Jose described the Mining Cannon – mining revenue redistributed by the government

to communities impacted by mining projects (Ponce & Mcclintock, 2014) – as beneficial, but

wrought with corruption and inadequate distribution:

> *I think that a good measure that the mine is working on to correct this [not helping local communities] is the Mining Cannon. It's something I liked a lot, and I've heard, that instead of giving money directly, they build or do a project and important infrastructure for a nearby town. For example, they build hospitals, fix roads, build buildings, build schools, and that ultimately helps community growth. Because just giving money that then just disappears somewhere… it's interesting because I've heard that they always give money and they never see, never see it expressed in the community. So you feel a bit like it's all talk, which is very much associated with corruption.* - Jose, 23, Male, Urban, Non-mine province

Comments by Juan and Jose are consistent with research around the distribution of the mining

cannon, suggesting youth are aware of the issues around mining, social conflict, and the misuse

or poor allocation of the mining Cannon (Ponce & Mcclintock, 2014). Despite this awareness,

most still perceived the overall economic benefits associated with mining to be positive. For

example, Barbara explained:

> *I consider that in Peru, in some ways it [mining] is favorable because it helps the economy. And, well, it can help our economy, but the environmental impacts that they leave is not all favorable for our us in the future*. -Barbara, Woman, Urban, Non-mining province

Others, like Cyntia explained conflict around mines in general terms, but, like many of her peers,

highlights the economic and employment benefits offered by the mine. She explains:

> "*Some years ago there was an accident, a mining shipment broke and damaged the road. This limited transportation and communication between Cusco and Lima - a principal line that brings food and everything was harmed. Prices went up... So because of this many said it was the mine's fault and their responsibility, they shouldn't have done that. And others said, no, it's the government's fault for not managing things well. So then there was a debate about how the mine doesn't... how the mine harms us and others that said no, the mine benefits us. But yes, it manifested in that some are for and others are against. Many are against [the mine] because of the environment, because they leave a small Cannon, but many of us are in favor thanks to the economic activity, since that is the mere fact of transporting people to work. They leave us good economic activity. Many are in favor and against.*" -Cyntia, 19, Woman, Urban, Mining area.

From an urban area impacted by mining activity, Cyntia placed herself with the pro-

mining group, using phrases like "many of us are in favor", while describing the conflict around

mines in terms of "others". While she was aware of the impact of mines and the social disputes

around it, she perceived economic benefits from the mine. In contrast, Maria lived in a rural

community directly impacted by an active, large-scale mining project. Her account of the mine

and its relationship with her community resonated with numerous previous case studies in Peru

that have documented such tensions, describing tensions within the community and a lack of

agency felt by community-members in terms of decision-making around the mine (Bebbington &

Bebbington, 2018; Hinojosa, 2013; Paredes, 2019; Petrova & Marinova, 2013). Unlike the others

interviewed for this project, Maria did not perceive economic benefits to mines. She explained:

"*When they first started this project they said that there would be a lot of work opportunities. They said that it would benefit the community. The typical promise, no? The political promise that they make. They tell you that mine will bring jobs, the mine offers opportunity. But since they started with these mining projects, you haven't seen any labor market increase; on the contrary, I see more unemployment. There are not job opportunities for everyone, like they said. All of the professionals are brought from outside. They don't give opportunities to our professionals in the area, and on the other hand, they create community divisions*." -Maria, 29, Woman, Rural, Mining province.

Thus, while Maria's peers perceived the economic benefits of mining, Maria's direct experience speaks to broader findings associated with mining communities in Peru and around the world; few labor-market opportunities for local community members and social divisions (Apergis & Katsaiti, 2018; Aragón & Rud, 2013a; Bury, 2005; Hinojosa, 2013; Pokorny et al., 2019; Santos, 2018; Steel, 2013). While studies that aggregate employment outcomes around mining developments have found mining to be associated with reduced unemployment, Maria perceived *more* unemployment. Her perceptions may reflect local realities for rural communities in which the combination of land appropriation, out-migration and employment opportunities specializing in mining excludes rural residents from employment opportunities (Bebbington & Bebbington, 2018; Bury, 2005). In addition to the lack of perceived employment opportunities, Maria offered a particularly insightful account of how youth in her community were impacted by social conflict around mining. She explains:

"*[Mining] companies that come from other countries to harm, to harm your home, believing they have the right to do it. And you, as a child, a teenager, not being able to do anything or say anything, no? Because, you simply look at the situation and in some way that creates traumas, it creates psychological problems that… more than anything is creates psychological problems in all of the kids, the teens. Why? Because there will always be two ways to take things that… the obstacles that we are going to have ahead, no? You can take it positive, or negatively. There are a lot of kids today, or youth actually, that if you say "hey, what do you know about the mine?" they say "no, we don't want the mine". I mean, they have a reaction. They have a reaction that is often defensive but, well, from afar it might even look funny, but it should be. Why? Because in some way we are harming their childhoods. They now think of themselves as warriors.*" - Maria, 29, Woman, Rural, Mine province

Maria's account contributes a deeper understanding of youth experiences in mining areas that are difficult to capture through survey data. She described the impact of mines as entrenched in childhood and youth experiences in her community. Maria viewed such experiences at young ages as traumatic and psychologically damaging. Her direct experience stands in contrast with her peers, who – with the exception of Jose – had no direct experience working with or around mines. In fact, only three percent of youth sampled by the survey reported working for a mine, though 23 percent reported they would consider working for a mine in the future. Among those interviewed, only one (Jose) had ever worked for a mining company. Eight interviewees said that, given the opportunity, they would work for a mine in some capacity. This parallels research from Sierra Leone, in which youth discontent with mining did not translate into a desire for mining activity to cease, as youth had come to associated mines with opportunity for employment (Maconachie, 2014). In fact, two interviewees (Carlos and Juan) had applied for positions with mines, but had not obtained employment. Thus, the political economy of mining is reflected in youths' resounding acceptance of mines as an opportunity for work, despite low probabilities of them actually obtaining employment through mines.

The sample of youth included in this study had limited experience working for mines directly (3% of sample), but 94% reported having family members who worked for a mine in some capacity. Therefore, while youth engaged in this study had limited personal experience working for a mine, nearly all participants had some familiarity through family regarding what mining employment was like. The most common position held by a family member in the mines was machine or equipment operator. This is consistent with national statistics and empirical work revealing low employment of Peruvians in multinational mines, and reports of professional positions going to those outside of local communities (Bury, 2005; Soto-Viruet, 2022). Given

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youth familiarity with mining jobs, interview respondents resoundingly described positions with the mines as well paid, allowing their family or friends to live comfortably. However, youth also described mining employment as hard work, both physically demanding as well as socially and emotionally challenging. Working for mines was described as demanding lengthy periods away from family. Jose's account confirmed the second-hand experiences described by his peers. He had previously worked for a mining company, having been recruited out of college for a professional youth training program run by a large mining company in Northern Peru. Jose explained:

> "*Most people earn well, good money. For example there are categories; the lowest category in the mine, I was practically [the lowest]… I earned 1,800 soles, but the positions that are above this, the operator, which were people who didn't have university training but did manual work, they earned the lowest, and the lowest was 4,900 soles… The work is tiring because you work 14 days without rest, 12 hours a day. But you rest 14 days. So you work 14 days without rest for 12 hours a day. I got up at 5:00am in the morning and got back to my room really tired after working until almost 10:00pm at night. I would go straight to sleep, because I had to bath and get dressed the next day and I was so tired. And if there was an emergency, for example, or a strike in the entrance. Sometimes the community could be in disagreement with the mine or there was an avalanche that blocked the road. They told us that since they couldn't bring in our replacements – because they are 14 days on, we work 14 days and rest 14 days – we have a replacement the 15 days that we are at home, sleeping and resting with family. So, those 14 days a bus would come, but if it couldn't get there, we had to keep working. They pay you extra, but it wasn't that cool. You could stay there 21 days, 30 days if they took a long time to clean the road or solve the problem. That was a little tiring because it was 30 days without rest, working 12 hours every day, it was a little tiring.*" - Jose, 23, Male, Urban, Non-mine

Despite the good pay and encouragement from his father to keep the job, Jose did not enjoy the work given the long work days and extended time away from home. He left his job to go back to school, get a Master's degree, and one day become a researcher. He described his decision to work for the mine because he didn't have a job or any money, and thought it would be a good way to gain experience and save. His work experience reveals the high demands placed on young, professional workers for the mines. Having earned the role through a youth

training program, he described receiving the lowest pay despite his university degree. Jose's experience is illustrative because it demonstrates how, on the one hand, mines offer opportunities for professional development for young people. On the other hand, Jose's experience is unique in that he was the only person interviewed from the capital city, Lima. As evident through survey analysis and narratives offered by participants, the opportunity afforded to Jose is not equally accessible to other young people in Peru, particularly not to young women and those from rural areas. In fact, qualitative evidence from this project – presented in detail below – suggests rural youth lack guidance when considering higher education compared to urban youth. In addition, young women were more likely to describe being influenced by their families regarding their higher educational decisions. Therefore, I now turn to analysis of whether the *types* of jobs and higher education youth pursue and how youth *describe* their experiences and goals differ between mining and non-mining areas across axes of gender and geography.

Youth outcomes and aspirations: testing the associations with gender and geography

Previous models using survey data offer limited insight as to whether the *type* of work and subjects of study vary by residence in a mining province, gender, and rurality. Neither do prior models offer insight into how youth describe and perceive their current circumstances and future plans. Previous research assessing youth aspirations in Peru suggest that women are more likely to pursue higher education, but less likely to pursue STEM (Science, Technology, Engineering, and Math) fields (Guerrero & Rojas, 2020). In addition, youth from rural areas may have limited access to higher education or less disciplinary variation accessible to them compared to youth in urban areas (Leinaweaver, 2008). In order to disentangle such nuanced relationships – and to address the final sub-question for this chapter – subsequent analyses

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presented below examine whether the *types* of jobs and higher education training youth pursue

and how youth *describe* their experiences and goals differ between mining and non-mining areas

and across axes of gender and geography. I draw from survey results in which youth describe

their employment, areas of study and future aspirations. Responses were re-coded into areas of

study to facilitate quantitative analysis. Descriptions for how text responses were re-coded can be

found in Appendix D. Table 7.9 and 7.10 display descriptive statistics of youth responses to five

questions: describe current job, describe area of study, describe aspirations following secondary

schooling, and describe employment aspirations in one year and five years.

Table 7.9: Descriptive statistics - work, study and aspirational descriptions by gender (weighted sample)

	Women		Men	
	Mine	**Non-mine**	**Mine**	**Non-mine**
	Proportion	*Proportion*	*Proportion*	*Proportion*
Type of work				
Professional	0.45	0.45	0.50	0.45
Service	0.55	0.05	0.04	0.42
Agriculture / Manual labor	0.00	0.04	0.26	0.08
Other	0.00	0.01	0.20	0.05
N	25	77	20	43
Subject of study				
Administration	0.41	0.14	0.23	0.21
Science	0.02	0.20	0.00	0.25
Social Science	0.18	0.14	0.11	0.15
Engineering/Architecture	0.06	0.15	0.43	0.17
Nursing / Teaching	0.25	0.31	0.10	0.11
Other	0.08	0.06	0.13	0.10
N	41	108	18	55
Aspirations after secondary				
Work	0.32	0.27	0.47	0.41
Study higher ed	0.51	0.55	0.36	0.46
Travel	0.12	0.08	0.12	0.05
Other	0.05	0.10	0.05	0.08
N	64	177	40	106
Work aspirations - 1 year				
Technical/professional	0.49	0.39	0.41	0.18

	Mine Proportion	Non-mine Proportion	Mine Proportion	Non-mine Proportion
Social, environmental, public service	0.31	0.35	0.33	0.61
Sales/Marketing	0.05	0.13	0.08	0.16
Entrepreneur	0.03	0.03	0.05	0.04
Other	0.12	0.11	0.13	0.01
N	48	125	29	73
Work aspirations - 5 years				
Technical/professional	0.38	0.31	0.37	0.46
Social, environmental, public service	0.42	0.47	0.36	0.41
Entrepreneur	0.14	0.14	0.13	0.06
Other	0.07	0.08	0.14	0.07
N	48	127	30	73

Table 7.10: Descriptive statistics - work, study and aspirational descriptions by rural/urban status (weighted sample)

	Rural		Urban	
	Mine	**Non-mine**	**Mine**	**Non-mine**
	Proportion	*Proportion*	*Proportion*	*Proportion*
Type of work				
Professional	0.18	0.21	0.64	0.56
Service	0.50	0.65	0.20	0.37
Agriculture / Manual labor	0.30	0.13	0.03	0.02
Other	0.03	0.01	0.13	0.04
N	15	31	30	89
Subject of study				
Administration	0.27	0.12	0.40	0.20
Science	0.00	0.34	0.02	0.15
Social Science	0.06	0.02	0.22	0.21
Engineering/Architecture	0.20	0.08	0.19	0.21
Nursing / Teaching	0.30	0.41	0.12	0.12
Other	0.18	0.03	0.05	0.10
N	23	58	36	105
Aspirations after secondary				
Work	0.47	0.35	0.34	0.33
Study higher ed	0.52	0.49	0.40	0.51
Travel	0.01	0.07	0.18	0.06
Other	0.00	0.09	0.08	0.10
N	37	92	67	191
Work aspirations - 1 year				
Technical/professional	0.39	0.39	0.49	0.54

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Social, environmental, public service	0.38	0.26	0.29	0.25
Sales/Marketing	0.11	0.12	0.04	0.07
Entrepreneur	0.02	0.03	0.04	0.02
Other	0.10	0.21	0.12	0.11
N	25	57	52	141
Work aspirations - 5 years				
Technical/professional	0.50	0.22	0.30	0.46
Social, environmental, public service	0.34	0.51	0.42	0.41
Entrepreneur	0.01	0.11	0.20	0.10
Other	0.14	0.15	0.08	0.04
N	29	61	49	139

Table 7.9 and 7.10 reveal that larger shares of women in mining areas and men in non-mining areas work in service professions compared to their peers. A larger share of those in rural areas reported employment in service professions and agriculture or manual labor positions compared to their urban counterparts, a finding that is consistent with reports on youth employment and represents the opportunity structures in rural vs. urban areas (OECD, 2017). A larger share of men in mining areas reported studying engineering compared to women and men in non-mining areas, while the majority of women in mining areas reported studying administrative, nursing or teaching degrees. This later finding is reflected among interview respondents as well: all four participants who reside in mining areas were either currently studying or had completed a degree in administration, finance or international business. Those who did not reside in large-scale mining areas studied or planned to study engineering (4), administration (2), or computer science (1). Three of the four young participants from mining areas are women, and one is a young man in a rural area. As will be further elaborated below, descriptions of how career and educational decisions were made are marked by gender and rurality among the youth interviewed for this project. Finally, descriptive statistics from Table 7.9 reveal that a smaller share of women in mining and non-mining areas aspired to find work

compared to young men, reporting higher education as their post-secondary school aspirations. This is consistent with prior work by Dercon and Singh (2013) and Ames (2013) in which familial expectations for young women's education in Peru has been on the rise. Among interview participants, higher education was described and framed as a necessary and assumed next step in their careers, consistent with previous findings about youth educational aspirations in Peru (Ames, 2013; Leinaweaver, 2008).

In order to assess whether such descriptive differences are statistically significant, I use the Pearson chi-squared test for statistical significance (Rao & Scott, 1981). Pearson chi-squared tests are useful for assessing whether two outcomes significantly differ between groups.

Table 7.11: Pearson chi-squared correlations (weighted sample)

	Mine province chi-squared	**Non-mining provinces** chi-squared
Gender		
Type of work	5.653**	0.727
Subject of study	1.989	1.251
Post-secondary aspirations	0.6579	1.626
Aspirations 1 year	0.179	3.281*
Aspirations 5 years	0.254	1.248
Rural/Urban		
Type of work	4.826**	5.116**
Subject of study	1.534	6.400***
Post-secondary aspirations	3.729*	0.059
Aspirations 1 year	0.668	1.003
Aspirations 5 years	2.467	3.345*

Significance: * $p<0.05$ **$p<0.01$ *** $p<0.001$

The results of the chi-squared tests are displayed in Table 7.11 and reveal significant differences between men and women in mining provinces in terms of their type of work. While a similar share of men and women in mining areas are professionally employed, a larger share of

women in mining areas work in service roles, while significantly more men are employed in agriculture and/or manual labor roles. This finding suggests a gendered labor division consistent with prior research in mining areas in which young women are more likely be employed in service roles compared to young men (Segerstedt & Abrahamsson, 2019). Young men in mining areas, particularly those from rural areas and/or of lower socioeconomic status, are more likely to work in physically demanding roles (Park et al., 2019). Indeed, when asked whether men and women could obtain different types of positions within large-scale mines, interview participants confirmed resoundingly that men would get physically strenuous roles, while administrative positions were more likely to be filled by women. For example, when asked what type of work a young woman could get with a mine, participants responded:

> "*No, I don't think [she could get a job with a mine]. Because it's more, the mine is associated with, it has this idea that it's for men.*" -Barbara, 18, Female, Urban, Non-mine province

> Researcher: "*What do you think about the fact that there are differences in the types of jobs men and women can get?*"
> Carlos: "*The differences, I don't know, I think it's biological. I mean, you don't see a lot of people, of women, doing heavy work, maybe, that requires strength. It could be prejudice or could be machismo, but, like, it stays that way. Or maybe the female population, maybe they don't dare do that type of work.*" - Carlos, 25, Male, Urban, Non-mine province

> "*There is a ton of work there in the mine, a ton of positions. The heavy work is for men. Women take notes, taking information to the boss.*" -Hector, 21, Male, Urban, Non-mine province

> "*… but men are, well, stronger, or can carry more weight, move faster. So men, they always contract men in mines. And when we talk about administrative roles, there I think the opportunities are fought over, very competitive. Because I even had a friend, and she was an administrator in a mine. But, up to now I still don't know any man that is an administrator in a mine.*" -Javier, 22, Male, Urban, Non-mine province

> "*Normally women occupy light work positions, not heavy work. Not heavy machinery, but light work, administrative work or those that are related to mining engineering and geology*" -Cyntia, Woman, Urban, Mining province

These excerpts reflect a consistent and pervasive message from young respondents about the perceived roles for men and women in mines. In fact, the only respondent who previously worked for a large-scale mine expressed the opinion that heavy-lifting and labor- intensive work was not suitable for women, though he mentioned that he had known many women who operated heavy machinery. Such qualitative insights reflect the pervasiveness of "mining masculinity" described by Segerstedt and Abrahamsson (2019, p. 617). Mining work is perceived around the world as "men's work", and mining areas are often characterized by masculine attitudes and machismo. Young women may be discouraged from pursuing a field related to mining, an experience Valeria described:

> "*I was really interested in Mining Engineering... in my region there is only one university with mining engineering, the national university... my older brother studies there and my older brother got a little involved in my decision because he knows the situation in the national university, and specifically in the mining faculty. He commented to me that is it a little corrupt, so to speak. Then, especially since I am a woman, it was going to affect me because there are professors who go too far with their students, no? So my brother said that, that happens. And sometimes I see the mining students and they are all playing cards, they don't study, and I don't know what. My brother studies economics, one of the best fields in the national university, so, I was hearing these comments and so I thought about it.*" -Valeria, Woman, 19, Urban, Mining province

Valeria's experience is exemplary of an undercurrent of machismo that discourages women from certain fields in Peru, resulting in a systemic under-representation of women in STEM fields (Guerrero & Rojas, 2020). In addition, Valeria's experience parallels those of several other young women participants in terms of the role of family in their academic and career decision-making. For example, Maria – who had already earned a degree in agriculture – described her decision to pursue that field:

> *It all started to fulfill, practically, my mother's dream, because she always dreamed that I would study agriculture. I never saw it as an option, but the moment came… Because she was in poor health… And practically it was her, like her will, no? That she said "look, you know what… I wouldn't want to go from this world without seeing you, no? Seeing you*

study agriculture." So, it was because of that that I started studying agricultural production. -Maria, Woman, 29, Rural mining province

Their stories speak to previous qualitative work that finds women's career decisions are often dictated by other family members and were undermined by familial domestic responsibility (Ames, 2013; Dercon & Singh, 2013; Guerrero & Rojas, 2020). The interconnectedness of family and context in youth decision-making can be situated within Sen's (1987) multiple identities framework. Specifically, young women's identities as women and as family members were found to strongly influence their career paths and aspirations. As women, youth are excluded and discouraged from fields that are perceived as male-dominated and, therefore, unsafe or unfriendly to young women. Familial roles and memberships also dictate what these young people study and where. This deeper and more nuanced understanding of youth experiences is not captured in traditional quantitative measures, thus shedding light on the ways in which gender and family influence youth outcomes within a political economy of mining and extraction.

In addition to differences between men and women, type of employment is found to be significantly different between those in rural and urban areas in both mine and non-mine provinces. In mining areas, a significantly higher share of urban youth is found to be employed in professional occupations compared to youth from rural areas. In non-mining areas, a larger share of rural youth is engaged in agriculture and service roles and fewer are employed in professional occupations compared to their urban peers. In addition, rural and urban youth in non-mining areas study significantly different subjects. While the share of urban youth is spread across a range of disciplines, rural youth are concentrated in fields of nursing, teaching, science and administration. Such patterns reflect a national portrait of rural-urban divisions in labor-

market and educational opportunity found by the OECD (2017), contributing additional

distinctions between those in mining areas and those who are not.

Interview respondents offered richer contextualization of young people's lived

experiences between rural and urban areas in terms of their academic and employment pursuits.

For example, Alberto, grew up in an agricultural, non-mining community in Northern Peru as

one of twelve siblings. He described delays finishing his secondary education, recently

completing his public-school education at age 21. Alberto was currently working in Ecuador in

the shrimping industry and attributed his delays in schooling partially to his family dynamics:

> *Because my mom is separated, I don't know, she has her partner and my dad does too. Maybe it's a little difficult for my mom and me to understand each other. To find her looking after me, to look after how I do in school. Well, maybe that's why... that's why I took so much longer in school.* -Alberto, Man, 21, Rural non-mining province

Alberto currently sought to pursue a degree in heavy machinery. When asked why he wanted to

study that field, he responded:

> *Well, on the one hand because it's a bit, like, a shorter degree, no? Because sometimes to study more time, they said, three-to-four, five years, it demands a lot of money. And sometimes, how can I tell you? I don't have help at times from my parents who are poor. I have to work hard on my own.* -Alberto, Man, 21, Rural, Non-mining province

Alberto's experiences of poverty and family separation influenced his current situation as well as

his future goals. On the other hand, rural youth may feel compelled to obtain a college degree,

but lack information about what options are available. For example, Juan is a young man in a

northern mining area of Peru. From a rural town in which most people are employed in

agriculture and pastoralism, Juan was raised by public school teachers with one sibling. Juan

described knowing he would go on to study *something* in college, but described the challenges

around making choices about what and how to study:

> *Well, to start... the motivation [to go to] university is like I told you. You finish secondary school and you have to choose something. I'm going to say this, this was 8... 9 years ago,*

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and it was something, you know, something impactful, no? Because… I remember that I finished high school and I swear I didn't know that university existed, even though I have parents who are teachers, no one ever told me "look, after secondary what will you do?" Yes, everyone asks this type of question, no? But, for example, they asked me and I still remember that I responded 'fighter pilot', no? But, just that, you know? But no one tells you that for this you need to study somewhere else, or tells you that for that there is something called university or something like that. So that was impactful.

And where is the university? … And then you have to migrate, and where do you migrate? Where you have family, right? You can't go alone, you have to look for support, no? So you look for, for example, the brothers of your dad that live there or something like that, and that's how I went. I went to the university. I remember that here you have to apply for the public universities, they have an exam. I remember I was… here in secondary… I was one of the best students, no? But when I went to the city I was one of the worst. So that is the abysmal difference that there is. And it opens your eyes, and it makes you mad as well.
-Juan, Man, 27, Rural mining province

Juan described doubt and insecurity about his academic choices that he associated with a lack of orientation in his formative secondary-school years. Such experiences led him away from his home community, where he later returned and now works for the local municipality in the tourism department. He hopes to remain in his community, possibly opening a business or becoming mayor. The experiences emerging from Alberto and Juan reveal a persistent belief that higher education is needed, but limited information, guidance, and financial resources constrain their possibilities. In addition, the lack of engagement from their families – for Alberto his parental separation and for Juan his parents' lack of discussion about future options – were weaved into narratives about their choices and outcomes. As such, while young women's familial identities are described as playing active roles in their lives, young men's familial identities are perceived to influence their outcomes by way of disengagement. Below, I describe how a similar gendered pattern of familial influence emerges within discussions around future aspirations.

Survey results reveal significant differences in one-year aspirations in non-mining areas between men and women, and 5-year aspirational differences between rural and urban areas. A

larger share of young men in non-mining areas aspire to roles in public service, protecting the environment, or serving their communities compared to women. A larger share of young women aspired to technical or professional roles in the next year. This finding may reflect a broader trend in Peru in which families invest in young women and girls to improve their own and their families' futures (Dercon & Singh, 2013). Girls in Peru are perceived as more likely to stay home and support their families compared to boys, and thus parental expectations for them may be higher or more pointed (Ames, 2013). Interview responses about future goals shed light on such gendered differences in how youth describe their futures. In response to a question about what they hoped for themselves in the future, young women typically responded with practical goals such as pursuing a higher degree or becoming a professional. Young men were more likely to lead with broad goals of happiness, satisfaction, and earning a good living. The following examples illustrate the ways women and men described their future goals. Barbara explained:

> "*If God allows, I would like to study, finish my studies, to my postgrad degree, my Masters. I want to achieve more things than what my parents have done to have better opportunities in my professional life.*" - Barbara, 18, Woman, Urban, Non-mining province.

Barbara, from a human settlement outside of a regional capital city in the jungle of Peru explained her goals within a framework of how hard her family struggled to give her and her nine siblings more opportunities than they had. She felt inspired by their hard work and sacrifice, and employed her family's history as motivating her to work hard for a better future. In another part of the Peruvian jungle region, Zoila currently worked in a plastic factory in order to support her young child. Having left her studies to work to support her baby, she described her future goals:

> "*In the future I would like to learn, well, what I was studying was information processing, but normally I would like to study something else, which would be nursing. And, well, I*

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would like to have, work, study, and start a business that would be mine, and, well, live off of that, in the future." -Zoila, 23, Woman, Urban, Non-mining province.

Cyntia, who studies finance in a regional capital city described her future goals in the following way:

"*I would like to develop personally in a professional setting. For that my short-term goal is to finish university, successfully one could say, and having the best grades. And, look for a scholarship that would finance studies in Lima or abroad. In terms of quality of life as a person, I like to go out, travel, get to know a lot places, learn other languages, and all of that.*" -Cyntia, 19, Woman, Urban, Mining province.

Finally, Maria lived in a rural area neighboring a large-scale mining project. As the only rural woman interviewed for this project, Maria's experiences are particularly illuminating. Living with her step father and mother, Maria described the importance of her family in supporting her and guiding her. As noted previously, Marie's mother influenced her decision to study agriculture, a field she grew to love when she connected to content related to protecting animals and the environment. In addition, Maria identified herself as being native and speaking Quechua, one of the native languages in Peru. She described the discrimination her grandparents faced when they migrated from the Andean region, and discrimination she experienced growing up as a Quechua speaker. Finally, she attended a unique pilot school program that championed community service and giving back in rural areas. Thus, her family and life experiences were instrumental in shaping her passion for helping her community, driving her to study an additional degree in public administration.

In Maria's case, her experience in a rural area, her self-described interconnectedness with nature, her unique educational background and her drive to help society all form part of her future goals. Overall, women interviewed for this project had clear visions of what their futures could be. On the other hand, young men often couched their goals within broader ambitions for happiness and well-being. For example,

"Well, I hope for many things. Which, in a few words, I hope to reach more happiness, no? Now, more specifically, I would like to get a job that allows me to have time to do a lot of things, things that I like to do. I don't hope for a job that absorbs all my time, all day." - Carlos, 25, Male, Urban, Non-mine province

"Abundance, everyone wants that. Prosperity, happiness, not just for me but for my family. To take my family to another country, that's my dream. Take them… get them out of Peru and take them with me. When I have my own profession and live in another country, to take them there." -Hector, 21, Male, Urban, Non-mine province

"It's interesting because, like I said, it depends how you ask me, no? What do you hope for in the educational sense, what do you hope for professionally because they are different things. What do you hope for personally and yes. Well, personally, what I want is to be happy. No? What, what a human being is always searching for. I am not a person who has the need to share my life with someone else, so things like get married or have kids are things that, that I would not like. I am not waiting and I'm also not looking for that. But in terms of happiness, yes. The way for me to be happy is when I know I've left my mark on humanity. Because I am not afraid of death but I am afraid of being forgotten……. And in reality, my goals, like, where I am aiming is this: to be mayor of my city, or well, regional governor they say now. And well, as my mom says "If God wills it" then, I can aim to be President." -Javier, 22, Male, Urban, Non-mine province

"My life in the future I see it on a good track, I see it prosperous, I see that… with my family. In general I, I like to travel but also I like to come back, no? I want to travel the world but I also want that, to hold with me that I will always be here, I mean, I will always come back here." -Juan, 27, Male, Rural, Mine province

What emerges from responses to questions about future aspirations is that young women ground their goals in their current realities and practical ambitions within their experiences. Their goals are further attributed to their lived experiences and their families. On the other hand, young men describe their aspirations more broadly, rooting their hopes in abstract feelings of happiness and fulfillment. References to family are prominent among young men when describing their future goals. For young men, family forms a part of their future (forming a family or not, bringing family to another country), but unlike young women, young men were less likely to describe familial influence in their career decision-making. Instead, young men often articulated histories of family separation and associated mental health struggles as influencing their happiness and well-being. Discussions of mental health brought up among young men

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participants and their aspirations for prosperity and happiness may speak to broader societal

expectations for young men. In Peru, despite educational and employment gains among women,

men are still often perceived as breadwinners and providers (Fuller, 2001). Such pressures to live

up to societal expectations in a difficult economic climate, compounded sector specialization

resulting from the political economy of mining, is reflected in how young men talk about their

futures.

Differences in how rural and urban youth envisioned their futures were also detected both

by survey data and through interviews. A significantly larger share of urban youth aspired to

professional occupations in five years compared to youth in rural areas. According to survey

results, youth in rural areas were more likely to report aspiring to service roles or "other", which

included references to positions that pay well, that will be enjoyable, or vague unspecified roles

such as "practitioner". Such differences in aspirations in rural areas may reflect broader

opportunities available in urban areas for professional development. Qualitative insights from

participant interviews are helpful to elucidate lived experiences. For example, Juan, cited above,

perceived his life as on track and prosperous. However, in describing his specific career goals, he

was vague:

> *If you ask me what are you going to do I couldn't tell you because I like to be an "everything" person. If you, if you propose a business idea and I see that it is going well I will do it. If I see another thing that I like I'll do that too. It's not that I like to be in only one thing. So that's it, that's the topic of having a good future, obviously, economically, a good place to have a happy family, that is all I see for my future.* -Juan, 27, Male, Rural, Mining Province

Similarly, Alberto from a small rural area described his future goals in the following way:

> *The first thing I want is to study, to get a degree, ya. And if I get the degree then I can make money, I can have things, I can go and study another degree, more related to my work. Actually, I don't know. I want to open opportunities, I want to get to know what opportunities there are because maybe I'll meet someone who maybe some professional and you know what? This degree is easier [they'll tell me], and maybe I'll try it cause*

I'm motivated, you know? Because what I want is to have a degree, but, little by little like I said, working like I am working now. They say sometimes that work is hard, but I don't want to reach a time, like, for me, difficult, in my old age as they say. I don't want to get there like this, sacrificing myself." -Alberto, 21, Male, Rural, Non-mine province

For Alberto like Juan, the end results of his future goals are happiness and prosperity. In Alberto's case, he sees getting his degree in *something* as a pathway out of hard manual labor, reflecting prior studies demonstrating youth's attitudes about higher education as a pathway out of poverty (Crivello, 2011). Finally, Maria described her future goals as serving her community. Like Alberto and Juan, she is less specific about the job she will do or hopes to do, and instead refers to general ways her career will be meaningful and impactful, both for her and society.

Youth from urban areas also expressed a desire to travel, either to migrate permanently out of the country or to temporarily leave to gain experience and knowledge about other areas. Getting a scholarship to study abroad was a common refrain I heard from participants from urban areas, reflecting a broader awareness of scholarship study opportunities. In fact, nearly all urban youth planned to leave their home cities, either for studies or work, and only one planned to live out their lives in their home town. In rural areas, two of three participants planned to stay in their communities to live out their adult lives. In contrast to literature emerging from the US and Canada about the rural brain drain and rural youth outmigration, I find that youth in urban areas are much more likely to want to migrate away from their home cities, while those in rural areas are rooted in a commitment to serve and improve their home communities (Coffey et al., 2018; Sherman & Sage, 2011).

Perceived constraints to reaching aspired futures

In addition to asking what youth aspire to and how such aspirations are influenced by proximity to mining, gender, ethnicity and rurality, I ask what constraints young people perceive to reaching their envisioned futures. Ten of the twelve participants asked about what they needed

to reach their future goals mentioned money. Funds to afford tertiary degrees, travel, or to pay startup costs for their own small businesses were seen as paramount. In addition to money, Valeria and Jose mentioned the need to learn another language, while Karla and Alberto mentioned the need to stay motivated and work hard. Some participants were asked what they believed could limit their ability to reach their future goals. Three young women mentioned the lack of opportunity and/or corruption. For example, Karla explained that the unstable economic conditions in Peru make it difficult to imagine or plan for your future. Similarly, Cyntia described the government's instability associated with the Covid-19 pandemic as adversely impacting her ability to get financial aid. Finally, Barbara described the need to have connections to get a good job as a limitation impacting her future prospects. These three examples illustrate the ways in which the broader political economic context is perceived by young people to affect the options available to them. In other words, economic and political conditions theorized to be interconnected with Peru's investment in mining as an economic development strategy restricts youth capabilities to reach their future aspirations (North & Grinspun, 2016; Sen, 1999).

What emerges from these excerpts is youth experiences regarding their academic choices were more profoundly influenced by gender and rurality than by proximity to mining, though this finding is likely attributable to the underrepresentation of participants from mining areas. What also emerges from interviews and survey data is the influence of the broader political economy of Peru as a mining state. For example, fields such as environmental engineering, heavy machinery operation and industrial engineering are popular among Peruvian youth, fields that are well suited to employment withing the mining complex. The type of work that women and men in mining areas engage in suggests undertones of an industry dominated by machismo, evident in other areas around the world and in youths' own perceptions of mining employment

(Segerstedt & Abrahamsson, 2019). In theoretical terms, the political economy of mining in Peru impacts youth capabilities to achieve their envisioned futures by way of employment and educational opportunities that are unevenly afforded across axes of gender and rurality (Sen, 1999).

Chapter synthesis

Drawing from independently collected survey data and in-depth interviews, I sought to disentangle youth experiences, perceptions, and aspirations within the political economy of a large-scale mining state. Specifically, I ask whether experiences, aspirations and perceptions differ between youth from mining areas and youth from non-mining areas. I expected that the direct exposure to mines would influence youth well-being by shifting opportunity structures in ways that specialize local economies around mining activity (Bunker, 1984; Bury, 2005). In other words, I expected youth employment in mining areas to be lower than in non-mining areas, and for the jobs youth did hold to be temporary, physically demanding, and/or related to the mining industry. However, survey and interview analysis reveal that youth experiences in terms of employment and study are not significantly different between those in areas impacted by mines and those in areas unaffected by mines. In other words, the capabilities of youth to pursue their goals and happiness do not appear to be undermined by proximity to large-scale mines in this sample of young Peruvians (Sen, 1999).

Existing studies have found that children benefit from proximity to mining activity in terms of their educational attainment and attendance (Jensen et al., 2012; Zabsonre et al., 2018). On the other hand, one study in Colombia found children were more likely to miss school in mine producing regions (Santos, 2018). In Peru, children impacted by mining activity had better

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schooling outcomes (Hiojosa, 2013). These works suggest children's schooling outcomes may improve, but none have assessed the implications for youth and higher educational outcomes. Secondary analysis conducted in Chapter 6 revealed that youth in mining provinces have significantly higher odds of obtaining higher education compared to those in non-mining provinces. Therefore, I expected that youth surveyed from mining areas would be more likely to be in or have completed higher education. However, survey and interview analysis reveal that the number of youth currently studying higher educational degrees is not significantly different between those in residing in provinces with large-scale mines and those in non-mine provinces. On the other hand, youth from mining provinces had significantly lower odds of aspiring to higher education in 1 to 5 years. In fact, narratives from interview participants affirm that those from mining areas were less likely to describe tertiary degree ambitions compared to their peers in non-mining provinces. This finding in consistent with prior work describing college ambitions among youth as pervasive (Ames, 2013; Leinaweaver, 2008). Viewed as a pathway out of poverty and a mechanism for better types of employment, youth across Peru hold higher education as a necessary step in their professional development. However, this analysis reveals that those in living in proximity to mines are less likely to aspire to higher education, particularly further education beyond college (Masters or PhD). Future research should address *why* youth from mining areas are less likely to aspire to higher education than their peers.

I find that youth outcomes and well-being vary significantly by gender and geography, rather than proximity to mining. This may be attributable to the broader political economy of mining: While some young people reside closer to large-scale mining projects, all youth in Peru live in a state in which mining is pursued as an economic development strategy (Aragon & Rud, 2013; Castillo & Brereton, 2018, Bebbington & Bebbington, 2018). I find that women are more

likely to describe family influencing their higher education and career decisions, while young men are more likely to describe their own mental health issues and family stress or absence. Within mining provinces, young women sampled by the survey had significantly different types of jobs than young men. Women in mining areas were more likely to hold service positions (assistants, receptionist, sales or caretaking roles). Young men surveyed from mining areas were more likely to hold positions in manual labor, agriculture, or artistic roles. Such differences are consistent with the body of work demonstrating women are largely excluded from positions in mining industry (Eftimie et al., 2009; Oxfam, 2017; Segerstedt & Abrahamsson, 2019). In fact, youth interviews reveal that youth themselves believe men and women do and should hold distinct roles in mining companies. The prevailing attitude among youth is that men are better suited for hard physical labor, a belief that reflects existing gendered labor divisions.

Distinct labor and educational divisions are found to exist between youth surveyed from rural and urban areas. Youth from rural areas were more likely to work in physical labor roles or agriculture compared to youth from urban areas, who were more likely to hold professional positions. This division is not surprising given previous work assessing youth opportunity and well-being between rural and urban areas (OECD, 2017). In addition, I find that youth from rural areas are more likely to study applied degrees such as nursing, teaching and administration. This may be associated with opportunity structures and practical employment goals. Interview narratives illustrate how rural youth are often less aware of opportunities and describe their employment goals in vague terms associated with economic stability. In Sen's terms (1999), rural youth experience capability deprivation based on extrinsic factors (access to universities, geography, local economic conditions) and intrinsic factors (motivation and aspirations). The opportunities available locally to rural youth are thus inherently interconnected with their

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aspirations such that the primary aspiration is to overcome lives of economic and physical hardship.

Finally, I find perceptions of mining among the sample of youth for this study to be remarkably consistent, reflecting a broader acceptance of the economic development paradigm in which large-scale mining is a key ingredient. Youth perceived mining to be economically beneficial for their country and communities, but also associated mining with social issues and environmental harm. Most youth have second-hand experience with mining through family, associating mining employment with good pay but also with being physically and emotionally challenging. Most interview participants were willing to take positions working for a mine, and two had applied for employment but not obtained positions. In sum, the resounding perception that mining is economically beneficial reflects the hegemonic development paradigm in which GDP growth is resoundingly positive, despite the fact that few youth themselves experience positive economic change associated with such growth.

In sum, findings from survey responses and interviews offer contemporary insight into the lived experience of youth within a political economy of large-scale mines. I find youth experiences and aspirations vary more by gender and geography than by proximity to mining, reflecting a subscription to the broader implications of mining for youth in an extraction-based economy. However, large-scale mines are associated with lower educational aspirations among youth living in proximity, as well as more physically-demanding employment for young men and service occupations for young women. Future scholarship should disentangle the mechanisms through which mining influence academic aspirations and the implications for perpetuating gendered labor divisions.

Chapter 8 – Conclusion, limitations and future directions

The research presented here began from the premise that large-scale mining as a national economic development strategy has implications for youth well-being. Deep histories of unequal exchange, colonization and power perpetuate large-scale extraction as a prevailing economic development strategy, despite evidence of long-term negative consequences for the communities and countries affected (Apergis & Katsaiti, 2018; G. A. Davis & Vásquez Cordano, 2013; Freudenburg & Wilson, 2002; Gamu et al., 2015; Ross, 1999). For youth in such contexts, the result of economic specialization, environmental deterioration, and community division can undermine their ability to thrive by way of capability deprivation (Sen, 1999). Representing the social, political and economic future of a nation, youth well-being is paramount for maintaining stable, safe and healthy communities (Cunningham, McGinnis, Verdu, Tesliuc, & Verner, 2008; Wolseth & Babb, 2008). Peru is the ideal setting for disentangling the relationships between large-scale mines and youth well-being. In recent decades, Peru has adopted aggressive economic liberalization and development projects, most notably by fostering international investment in the mining sector (Ponce & Mcclintock, 2014; Sullivan, 2014). As such, large-scale mining projects have proliferated in Peru since the early 1990s, offering a unique setting through which to assess the impacts of mining for youth.

This project drew from three data sources and employed multiple analytical strategies in order to triangulate results relating to youth well-being in the context of large-scale mining (Singleton & Straits, 2010). In what follows, I will re-articulate the main results, framing findings within the theoretical framework employed in this study and tying findings to previous research. I will highlight key limitations for interpreting these results, and conclude by describing policy implications and directions for future research.

To evaluate the impacts of large-scale mining on aggregate youth outcomes over time, I utilize both difference-in-differences and exploratory spatial analysis techniques. DD is a quasi-experimental methodology meant to isolate the effect of an intervention (Aragón & Rud, 2013; Puhani, 2012; Santos, 2018; Ticci & Escobal, 2014). As such, I isolated the impact on youth outcomes based on whether or not they were exposed to large-scale mines between 1993 - 2007. I assessed whether youth employment, higher education, and childbearing outcomes aggregated within provinces significantly differed over time between places that received a mine and those that did not. Prior research suggests that large-scale mining projects are associated with higher wages and less unemployment. For school-age children, mining has been associated with better school attendance in some contexts (i.e. Chile) and worse in others (i.e. Colombia) (Jensen et al., 2012; Santos, 2018). Limited evidence suggests youth experience employment benefits in mining areas (Maconachie, 2014). Theoretically, mining as an economic development strategy is lauded as a way to stimulate economic growth and create jobs (Broad & Fischer-Mackey, 2017; North & Grinspun, 2016; Ross, 1999). However, national economic growth attributable to mining is felt locally in minimal, socially stratified, and unequal ways (Aragón & Rud, 2013; Baillie et al., 2020; Bury, 2005; Ponce & Mcclintock, 2014). Indeed, I find that aggregate youth outcomes are not significantly different over time between those in provinces that received mines and those in areas that did not receive a mine (but otherwise could have). In addition, no significant differences were found for different occupations associated with the mining industry. This finding is noteworthy given the continued prevalence of large-scale mining investment in Peru. Within a political economy of mining, youth well-being in the form of employment and education is paramount for the country's future economic and social health. As in other contexts, a dearth of youth employment opportunities can result in growing unrest and conflict

(Maconachie, 2014; Wolseth & Babb, 2008). Indeed, social-environmental conflicts associated with large-scale mining projects have been on the rise in Peru, often led by women and youth (Isla, 2014; Sosa & Zwarteveen, 2012). Therefore, opportunities for employment, professional development, and educational advancement in mining areas is needed to offset potential social and political instability.

Aggregate analyses comparing mining provinces to non-mining provinces uncover national level patterns, but do not account for spatial variability *within* Peru. Therefore, I employ exploratory spatial analysis techniques, finding that youth outcomes vary across space. Specifically, youth in mining provinces in the Southern, central coast and central Andean region experience better employment and educational outcomes compared to their peers in the Northern mining region of Peru. This finding suggests that certain mining projects may be associated with better youth outcomes. Additional research is needed to disentangle what factors associated with large-scale mines influence youth well-being, possibly including characteristics of the mining company, community and youth outreach programming, physical geographic characteristics such as rurality or proximity to urban centers, etc.

In terms of demographic change, data limitations restrict DD analysis to measures of childbearing. No significant differences between mine and non-mine provinces over time are found in terms of the number of children born to young women. Prior work suggests that influxes of highly educated in-migrants is associated with less risky and transactional sexual behaviors, possibly lowering the likelihood of partnership and childbearing among young women (Wilson, 2012). However, this finding is not substantiated in the Peruvian context at the provincial level. Spatial results suggest the impacts are spatially dispersed rather than concentrated around mining projects, and no spatial relationship is found for in-migration.

Aggregations of youth outcomes do not enable researchers to shed light on individual-level probabilities of educational attainment, employment and demographic change within a given context (Voss, 2007). In addition, in the words of Voss (2007), "it is the individual, not aggregates, who act" (p. 463). Finally, aggregations of youth outcomes within provinces do not facilitate analysis of possible gendered and geographic differences of youth outcomes. Therefore, I employed logistic regression, multinomial regression models and analyzed interaction effects to disentangle the impacts of large-scale mining projects separately for youth in 1993 and 2007. As such, I was able to assess the impacts of mines built prior to 1993 on youth outcomes, the impacts for youth in areas with long histories of large-scale mining, and those impacted by the mining boom period between 1993 - 2007. Given the substantial body of literature assessing mining's differential impacts on rural livelihoods and for women, I expected rural youth and young women to have lower employment outcomes in mining areas compared to those in non-mining areas. On the other hand, I expected educational outcomes for rural youth and young women in mining areas to be higher than those in non-mine areas, associated with expanding educational opportunities and training institutes specializing in mining-related fields (engineering, heavy machine operation, management) and the Mining Cannon that allocates funds for research (Ponce & Mcclintock, 2014). In addition, youth in mining areas might envision greater returns for their investment in higher education (Crivello, 2011).

I find that youth in 2007 in mining areas had lower odds of being employed but higher odds of obtaining partial or complete higher education. In addition, older-mining areas are associated with demographic behaviors: lower odds of youth in-migration and bearing children. In addition, I find that youth employment is significantly more likely to be in machinery operation or elementary occupations (construction, cleaning, etc.) relative to professional

occupations, suggesting increasing precarity of labor-market conditions for youth in mining areas, particularly in those with long histories of mining ("double-mine" provinces). Finally, I find significant differences in well-being outcomes by gender and geography. Young women in mining areas are significantly less likely to be employed, or to be employed in the mining sector, compared to men in mining areas. Contrary to my predictions, educational gains for rural youth are not identified, but rural youth are found to have a distinct employment advantage in provinces with long histories of mining. These findings shed a unique light on the impacts of large-scale mines in the Peruvian context. While prior studies have found mixed evidence as to the schooling impacts of mining for school-age children, my research suggests that large-scale mining investments are associated with educational gains in mining-impacted areas, particularly beneficial for reducing the educational attainment gap between men and women (Jensen et al., 2012; Santos, 2018; Zabsonré et al., 2018). However, such gains are not necessarily translating into employment opportunities, suggesting the mining industry is not providing sufficient job opportunities for highly trained and qualified young people. Rural youth are found to experience the most employment gains, likely attributable to increased opportunities for low-skill, physically demanding and precarious work. In sum, within a political economic framework, mining as an economic development strategy may be a misguided effort, as a surplus of qualified and trained youth professionals enter a specialized job market in which they are overqualified and underemployed (OECD, 2017; Ross, 1999).

Insights from independently collected survey data and in-depth interviews provide a more nuanced understanding of the interconnections between large-scale mining and youth well-being in Peru. Drawing from Sen's (1999) conceptualization of capabilities, youth perceptions, current realities and future aspirations offer a fuller portrait of youth well-being within a political

economy of mining. In addition, these data offer more contemporary insights into youth perceptions of and experience of large-scale mining in their current political economic context. Given current literature suggesting gender and rurality play strong roles in educational and employment outcomes, I expected youth from rural areas and young women to have different outcomes and aspirations than their peers (Ames, 2013; OECD, 2017). Additionally, I expected youth in proximity to large-scale mines to have more negative perceptions of the social, economic and environmental impacts. However, survey and interview analysis reveal that youth employment and educational outcomes are not significantly different between those in areas impacted by mines and those in areas unaffected by mines. Within Sen's (1999) capabilities framework, the ability for a young person to pursue happiness in a mining area is not significantly different than for a young person in a non-mining area within this sample of young Peruvians. However, youth in mining areas were less likely to aspire to higher education in the next year or five years. Given that aspirations are reflections of current realities and expectations for capability development within a given context, being less likely to aspire to higher education may reflect a growing recognition of its limited utility in mining contexts (Crivello, 2015; McGregor, 2007).

Youth experiences, aspirations and outcomes were found to be more prominently marked by gender and rurality. Women and men were found to pursue different educational and career paths, formed by gendered expectations and familial obligations (Ames, 2013; Dercon & Singh, 2013; Guerrero & Rojas, 2020). Rural youth were found to be much more likely to be engaged in physically demanding roles, and to pursue practical and applied professions. Within a capability framework, youth capabilities can be understood as shaped more by opportunity structures associated with the socioeconomic conditions in rural areas, gender and gendered patterns of

labor, and by one's identity and role within a family (Sen 1987; 1999). In addition, building on the resource curse literature, the long-term impacts of a mining-based economy may be felt unevenly across axes of gender and rurality, as rural youth and young men seek training for mining-related careers while women face limited job opportunities in mining specialized areas.

Prior research documents social, economic and environmental impacts on communities around Peru (Aragón & Rud, 2013; Bebbington, Humphreys Bebbington, et al., 2008; Bury, 2005; Hinojosa, 2013; Ticci & Escobal, 2014). As such, I hypothesized that the lived experiences of youth in mining areas would translate into more negative perceptions of the mining industry. However, I found that youth resoundingly accept that mining offers an economic benefit for Peru, despite acknowledgments that benefits are not necessarily going to local communities (Ponce & Mcclintock, 2014). Indeed, nearly all youth sampled had a family member employed in the mining industry, reflecting the prominence of the industry in the broader political economy as well as the limited access to such employment for youth themselves. Most significantly, youth's acceptance of the economic benefit of mining reflects an acceptance of the mining-development paradigm in which national economic growth by way of extractive industries is associated with "development", despite the limited benefit to youth themselves. This finding is consistent with prior research on the power-dynamics between youth and mining projects found in Sierra Leone (Maconachie, 2014). While youth may contest the environmental impacts and social power mining projects inflict, they do not think large-scale mining should disappear from the country's economic landscape. Instead, youth experience the political economy through their family members employed in mines, national GDP growth, and well-publicized social conflicts around mining and local communities.

Limitations

A number of limitations temper interpretation of the results of this research project. Difference-in-differences and spatial techniques are subject to a number of limitations that influence interpretation of these results. First and foremost, the scale at which mining exposure is measured (province level) does not adequately capture the flow of goods and labor between mining projects, urban hubs, and rural areas (Bernard, Rowe, Bell, Ueffing, & Charles-Edwards, 2017a; Castillo & Brereton, 2018; Dell, 2010; Vincent, 2000). In other words, the social, economic and environmental impacts of any particular large-scale mining project are likely felt unevenly within and across provinces. For example, a mining project may be located near a border of two provinces. While the impacts are only technically assessed in one province, laborers and materials may be flowing from the capital city of another, neighboring province (Castillo & Brereton, 2018). Given data limitations, provinces are the smallest available unit in which to capture youth outcomes for the DD analysis employed in this study. While limited, this analytic strategy is consistent with prior work assessing the impacts of mining impacts that restricts analysis within geographic units (Santos, 2018; Ticci & Escobal, 2014; Zabsonre et al, 2018). I employed a number of methodological strategies to minimize this limitation. Spatial analysis techniques allow for an extension of mining impacts beyond single provincial unit boundaries, though are they still limited to province-level aggregations of youth outcomes. In addition, subsequent analysis of individual-level outcomes extended the assessment of mining-impacts to the department-level, while qualitative insights from interview data offered insights into the complex ways in which the political economy of mining transcends geopolitical boundaries.

Another key limitation of this study is how youth well-being is captured and conceptualized. Well-being is a contextually relevant and often subjective experience that is difficult to quantify, measure and compare across contexts (Crivello, 2015; McGregor, 2007). In addition, Sen's (1999) capabilities framework has been critiqued for the difficulty in operationalizing key constructs, such as capability and freedom (Burroway, 2017). Therefore, I utilize common measures of well-being employed in the literature (employment and education) as well as more subjective measures (aspirations, experiences) (Ames & Rojas, 2009; Chaaban, 2009; Crivello, 2015; OECD, 2017). By drawing from multiple data sources, I attempt to understand well-being both on aggregate and individual scales. Interview data, in particular, shed light on how youth experiences of mental health, family connections, and discrimination influenced individual well-being in this context. Broader measures of employment and education allowed for more comparability with existing research. Indeed, others have utilized educational attainment and employment in efforts to measure well-being within the capabilities framework (Burroway, 2017; Sen, 1999). Therefore, while this study is limited in how well-being is measured and assessed, I draw from previous literature and multiple data sources in an effort to offer a more complete picture.

Finally, a lack of representative sampling and thus generalizability of primary data limits this study's ability to speak in broad terms about the experiences of contemporary Peruvian youth. In particular, virtual data collection methods are limited to those who have access to technology. While a growing share of Peruvian youth have access to cell phones and internet, 16% of the rural population continued to live without regular electricity, compared to 1% of those in urban areas in 2019 (INEI, 2020). Considering large-scale mines are predominantly located in rural areas, this translates into a major limitation for this study. In an effort to

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minimize the effect of this limitation, survey weights were applied using a representative sample of Peruvian youth. In addition, results emerging from survey data did not contradict prior findings drawn from representative census samples from 1993 and 2007, suggesting a degree of validity by way of triangulation (Singleton & Straits, 2010).

Future directions & policy implications

This study points to a number of research directions fruitful for scholars of rural sociology, demography, natural resource development, and international studies. First and foremost, due to limitations associated with data availability, this investigation was unable to take advantage of the most recent Peruvian census data from 2017. Extensions of methodologies employed in this study, including DD, spatial analysis and regression could be applied to this more recent census data to assess longer-term impacts associated with large-scale mining projects for youth. Further, additional contextual controls may be of interest to future scholars interested in mining, youth outcomes and governance, such as ownership and management of the mine, community outreach efforts, infrastructural development associated with mines, or local government efficacy. For example, given results of spatial analysis suggesting better youth outcomes in some mining regions compared to others, it seems prudent to address whether management under different transnational organizations differentially impacts youth outcomes. Future research should identify practices that better serve youth and, therefore, broader social and economic well-being.

Qualitative insights of this study were limited to a dozen interviews, few of which were conducted with individuals who directly experienced the impacts of large-scale mining. Therefore, future scholarship should expand this study by including a larger sample of youth in

interviews, focus groups, or participant observation. Indeed, a number of themes emerging from in-depth interviews for this research are well-suited for further qualitative scrutiny. For example, exploring the factors that influence career and academic decision-making between young men and women and those from rural and urban areas, disentangling the interconnections between youth aspirations and family or community obligations, or deeper probes into gender beliefs associated with mining and mining employment. While qualitative research methods assessing the impacts of mining on communities have been applied in the Peruvian context, none have specifically addressed youth outcomes, perceptions and well-being (Bebbington & Bebbington, 2018; Hinojosa, 2013; Paredes, 2019; Petrova & Marinova, 2013; Segerstedt & Abrahamsson, 2019). Such insights would be invaluable for furthering understanding about the impacts of large-scale mining development on youth well-being.

The key finding from this study is that large-scale mining is associated with higher predicted odds of partial or completed education for women and those from rural areas. However, better odds of higher education did not translate into higher predicted odds of being employed. Indeed, aggregate province-level change over time suggests that youth in mining areas fare no better than their peers in non-mining areas. This finding contradicts the hegemonic neoliberal development paradigm of economic growth attributed to open-door mining investment and expansive development. Additionally, employment in mining areas among youth appears to be concentrated in physically demanding, service positions and manual labor. As such, youth face increasingly precarious working conditions. Policy makers should be attentive to labor protection laws and ensure that even informal positions are afforded minimum worker protections under the law.

Finally, in order to take advantage of the demographic dividend and avoid the pitfalls of specialization associated with the resource curse, policy makers should work to diversify Peru's economy beyond large-scale mining investments. A growing body of work suggests that an economic bust commonly follows economic booms associated with extraction-based growth, but such an outcome is not a foregone conclusion (Bunker, 1984; Davis & Vásquez Cordano, 2012; Fleming, Measham, & Paredes, 2015; Tallichet). Evidence suggests that efforts to diversify economies and maximize public windfalls associated with an extractive boom help support economies in their post-extraction phase (Kinchy et al., 2014; Tallichet, 2014). Alternative developmental paradigms that prioritize well-being, environmental protection and/or re-investment in social goods are growing traction in some areas of the Global South (Broad & Fischer-Mackey, 2017; North & Grinspun, 2016). Therefore, training opportunities and scholarships should be created for youth in diversified sectors. Finally, given the documented lack of women in STEM fields and under-representation of women in the mining sector, a strategy to promote women in STEM and to create safe working environments within the mining sector should be pursued (Guerrero & Rojas, 2020).

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Appendices

Appendix A: Survey Instrument (English)

Thank you for your interest in our study of youth aspirations! We are seeking young people ages 18-25 to answer a few questions about their communities, current school and work activities, and future plans. Your answers will help us better understand factors that influence youth well-being and long-term outcomes. This study is part of a thesis project by Carolyn Reyes, a graduate student at the Pennsylvania State University in the United States.

If you agree to participate, you will be asked to answer a series of questions in a survey. The survey will take around 20 minutes. For some questions, you will select a response from a list of options. Other questions will ask you to type in your answer. Your participation is **completely voluntary**. You may choose not to answer any question or may stop the survey at any time.

All of your answers will be completely **anonymous**, meaning there will be no way to know it was you that answered the questions. At the end of the survey, you will be asked if you would like to voluntarily provide your contact information for a follow-up virtual interview to discuss your responses on this survey. If you would not like to participate in a virtual interview, NO personally identifying information (such as your name or ID number) will be collected. The researcher will only see a random ID number assigned to each set of answers and will not be able to trace them back to you.

If you would like to participate in a follow-up, virtual interview, you will be asked for your first name, telephone number, and/or email address at the end of the survey. You may decide not to participate in the interview at any time. All records of your contact information will be removed from our records following your participation in a virtual interview, or if you decline to participate in an interview. If you agree to participate in an interview, your identity will not be disclosed or discernable in any future report that I write.

If you have any questions, concerns, or additional comments, please contact:

Carolyn Reyes	**Leif Jensen**
PhD Candidate	Distinguished Professor of
Rural Sociology & Demography	Rural Sociology & Demography
The Pennsylvania State University	The Pennsylvania State University
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If you would like to proceed with the survey, please click YES, NEXT

1. No, thank you
2. Yes, next

[**targetgroup**] Are you between the ages of 18-29?

1. Yes

2. No

[**thanks**] Thank you for agreeing to fill out this survey! Your responses will help us better understand how young people in Peru like you are doing.

Please answer the following questions as honestly as possible. THIS IS NOT A TEST. There are no right or wrong answers and you will NOT be evaluated based on your responses. Your answers are completely CONFIDENTIAL and ANONYMOUS; this means that no one will know what answers you provide or who you are. You may skip any questions that you prefer not to answer, or stop the survey at any time. Thank you!

[**q1**] Which one of the following best describes your current situation:

1. Employed full time, year-round (8 hours per day / 40 hours per week or more)
2. Employed part time, year-round (less than 8 hours per day / less than 40 hours per week)
3. Employed seasonally (full-time or part-time)
4. Studying at a college or university full-time
5. Studying at a college or university part-time
6. Studying at a technical institute full-time
7. Studying at a technical institute part-time
8. Mixture of employment and studying at a college/university or technical institute
9. Finishing High School
10. Finishing High School and working at the same time
11. Neither employed nor studying

[**q1a**] What do you do for work (example: receptionist, accountant, farmer)?

[**q1b**] Do you have to travel outside of your community for work?

1. Yes
2. No

[**q15b**] Approximately how much time to you spend traveling to your place of work?

1. Less than 30 minutes
2. 30- 59 minutes
3. 1 hour
4. 2 hours
5. 3 hours
6. More than 3 hours

[**q1c**] Approximately how many MONTHS per year are you employed?

1. 1
2. 2
3. 3

4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10
11. 11
12. 12

[**q1d**] Do you have to travel outside of your community for work?

1. Yes
2. No

[**q15d**] Approximately how much time to you spend traveling to your place of work?

1. Less than 30 minutes
2. 30- 59 minutes
3. 1 hour
4. 2 hours
5. 3 hours
6. More than 3 hours

[**q1e**] What subject are you studying?

[**q1f**] Do you have to travel outside of your community to study?

1. Yes
2. No

[**q15f**] Approximately how much time to you spend traveling to your place of study?

1. Less than 30 minutes
2. 30- 59 minutes
3. 1 hour
4. 2 hours
5. 3 hours
6. More than 3 hours

[**q1g**] What best describes your current situation? (select all that apply):

1. Caring for your household (including caring for children, elderly parents or grandparents)
2. Looking for work
3. Preparing for higher education studies
4. Other

[**q1g_4_text**] Text box from "Other" option in **q1g**.

[**q2**] If you could choose, which of the following best describes what you ***would like to be*** your situation **ONE YEAR from now** (select all that apply):

1. Employed full time, year-round (8 hours per day / 40 hours per week or more)
2. Employed part time, year-round (less than 8 hours per day / less than 40 hours per week)
3. Employed seasonally (full-time or part-time)
4. Studying at a college or university full-time
5. Studying at a college or university part-time
6. Studying at a technical institute full-time
7. Studying at a technical institute part-time
8. Finishing High School
9. Finishing High School and working at the same time
10. Forming a family or having children
11. Caring for elderly parents or grandparents
12. Other

[**q2_34_text**] Text box from "Other" option in **q2**.

[**q2a**] Please describe the type of work you would like to be doing one year from now:

[**q2b**] Please describe what you hope to be studying?

[**q3**] If you could choose, which of the following best describes what you ***would like to be*** your situation **FIVE YEARs from now** (select all that apply):

1. Employed full time, year-round (8 hours per day / 40 hours per week or more)
2. Employed part time, year-round (less than 8 hours per day / less than 40 hours per week)
3. Employed seasonally (full-time or part-time)
4. Studying at a college or university full-time
5. Studying at a college or university part-time
6. Studying at a technical institute full-time
7. Studying at a technical institute part-time
8. Forming a family or having children
9. Caring for elderly parents or grandparents
10. Other

[**q3_10_text**] Text box from "Other" option in **q3**.

[**q3a**] Please describe the type of work you would like to be doing five years from now:

[**q3b**] Please describe what you hope to be studying five years from now:

[**q4**] Think back to when you were last in school (not including higher education/university). What did you want to do after finishing secondary school?

[**q5**] What do you believe your parents or caretakers wanted you to do after finishing school (not including higher education/university)?

[**q6**] Do you feel like you have achieved what you wanted to do since leaving school (not including higher education/university)?

1. Yes
2. No

[**q6a**] Do you feel like you will achieve what you wanted to do since leaving school (not including higher education/university)?

1. Yes
2. No

[**q6b**] Please explain why you believe you will not do what you thought you would do after school (not including higher education/university):

[**q7**] Please select one of the following that best describes where you live?

1. Rural
2. Urban
3. Small town
4. Other

[**q7_4_text**] Text box from "Other" option in **q7**.

[**q8**] Have you always lived in the community where you are currently living?

1. Yes
2. No

[**q8a**] Why did you move to your current community?

1. Work
2. School
3. Romantic partnership / marriage
4. Other, please explain

[**q8a_4_text**] Text box from "Other" option in **q8a**.

[**q8b**] What year did you move to your current community?

[**q9**] Where you live now, how many people engage in the following types of work/industries?

    _1. Agriculture
    _2. Mining and extraction
    _2. Tourism
    _4. Services (hotels, restaurants, commercial shops, banks)
    _5. Public Sector (education, health or social work)
    _6. Independent worker (contractor, small business)

1. No one
2. Very few people
3. About half of the people
4. Nearly everyone
5. Everyone

[**q10**] Do you plan to make your life in your current community?

1. Yes
2. No

[**q10a**] Where would you like to live other than in your community?

[**q10b**] Please provide 1-2 reasons why you don't plan to make your life in your current community.

[**q10c**] Please explain why you would like to make your life in your current community.

[**q13**] What year were you born?

[**q14**] Which of the following best describes you:

1. Male
2. Female
3. I do not identify as either male or female
4. Prefer not to say

[**q15**] Which of the following best describes your marital status?

1. Single
2. Married
3. In a committed, unmarried relationship
4. Divorced or separated
5. Widowed

[**q16**] Do you have any children?

1. Yes
2. No

[**q16a**] How many children do you have?

[**child1**] Age of child 1
[**child2**] Age of child 2
[**child3**] Age of child 3
[**child4**] Age of child 4
[**child5**] Age of child 5
[**child6**] Age of child 6
[**child7**] Age of child 7
[**child8**] Age of child 8
[**child9**] Age of child 9
[**child10**] Age of child 10

0. Less than 1 year
1. 1 year
2. 2 years
3. 3 years
4. 4 years
5. 5 years
6. 6 years
7. 7 years
8. 8 years
9. 9 years
10. 10 or more years

[**q17**] Please select which of the following you identify as you your racial/ethnic identity (select all the apply)

1. Asiatic
2. Mestizo
3. Indigenous from the Andes
4. Native or indigenous of the Amazon
5. Black or Afrodescendant
6. White
7. Other

[**q17_6_text**] Text box from "Other" option in **q17**.

[**q18**] What is the highest level of education you completed?

1. No Schooling
2. Some Primary schooling
3. Primary (completed)

4. Some Secondary schooling
5. Secondary completed
6. Some technical institute training
7. Technical institute school completed
8. Some University
9. University Completed

[**q19**] What province do you live in?

[**q20**] Have you always lived in this province?
1. Yes
2. No

[**q20a**] Which province did you live in before your current province?

Provinces coded as in **q19**

Questions only for those who live in mining provinces

[**q22**] **The province you live in has a lot of mining activity. In this final section, we will ask you a few questions regarding your thoughts and experiences with the mine.**

Please rate how you perceive the following impacts of mining on **your community**.
_1. Social impact
_2. Economic impact
_3. Environmental impact

1. Mostly bad
2. Bad
3. No impact
4. Good
5. Very good

[**q23**] Please rate the impact of mining on **your life**.

_1. Impact of mining in your life

1. Mostly bad
2. Bad
3. No impact
4. Good
5. Very good

[**q24positive**] Have you perceived any of the following changes in your community? (select all the apply)
1. Economic growth.

2. Fewer people living in poverty.
3. Improved schooling infrastructure.
4. More higher education opportunities.
5. More employment opportunities for youth (ages 16-30).
6. Improved infrastructure (roads, buildings, running water, electricity)
7. Increased tourism.
8. Increase in people moving IN to the community (population growth).

[**q24negative**] Have you perceived any of the following changes in your community? (select all the apply)
1. Economic decline.
2. More people living in poverty.
3. Increase in people moving OUT of the community (population decline).
4. Increased crime/delinquency.
5. Fewer employment opportunities for youth (ages 16-30).
6. Decline in tourism.
7. More people employed in sex work.
8. Harm to the environment (ie: land degradation, water contamination, etc.)
9. Increased negative health impacts (ie: more work-related injuries or death, contamination- related health concerns)

[q62] Do you work for the mining industry?
1. Yes
2. No

[**q25**] Do you work for the mine in or near your community?

1. Yes
2. No

[**q25a**] Would you ever consider working for the mine in or near your community?

1. Yes
2. No

[**q25b**] What work do you do for the mine? (select all that apply)

1. Engineer
2. Security
3. Machine operation/equipment operators
4. Administrative work
5. Food/services (ie: janitorial work, meal preparation, hotel operation for mining laborers)
6. Transportation (of mining goods or mining employees)
7. Community outreach/communication
8. Health professionals
9. Other

[**q25b_9_text**] Text box from "Other" option in **q25b**.

[**q27**] How many members of your family are employed by the mine/s in your community?

0. 0
1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10+

[**q27a**] What work do your family members do for the mine? Select all that apply.

1. Engineer
2. Security
3. Machine operation/equipment operators
4. Administrative work
5. Food/services (ie: janitorial work, meal preparation, hotel operation for mining laborers)
6. Transportation (of mining goods or mining employees)
7. Community outreach/communication
8. Health professional
9. Other

[**q27a_9_text**] Text box from "Other" option in **q27a**.

Questions only for those who do not live in mining provinces
[q22] Peru has a lot of mining activity. In this section, we will ask you some questions about your thoughts and opinions of mining.

Please rate how you perceive the following impacts of mining in Peru.
_1. Social impact
_2. Economic impact
_3. Environmental impact

6. Mostly bad
7. Bad
8. No impact
9. Good
10. Very good

[**q23**] Please rate the impact of mining on **your life**.

_1. Impact of mining in your life

6. Mostly bad
7. Bad
8. No impact
9. Good
10. Very good

[**q24positive**] Have you perceived any of the following changes in your community? (select all the apply)
9. Economic growth.
10. Fewer people living in poverty.
11. Improved schooling infrastructure.
12. More higher education opportunities.
13. More employment opportunities for youth (ages 16-30).
14. Improved infrastructure (roads, buildings, running water, electricity)
15. Increased tourism.
16. Increase in people moving IN to the community (population growth).

[**q24negative**] Have you perceived any of the following changes in your community? (select all the apply)
10. Economic decline.
11. More people living in poverty.
12. Increase in people moving OUT of the community (population decline).
13. Increased crime/delinquency.
14. Fewer employment opportunities for youth (ages 16-30).
15. Decline in tourism.
16. More people employed in sex work.
17. Harm to the environment (ie: land degradation, water contamination, etc.)
18. Increased negative health impacts (ie: more work-related injuries or death, contamination- related health concerns)

[q62] Do you work for the mining industry?
1. Yes
2. No

[**q25**] Would you consider working for a mining company or the mining industry?

3. Yes
4. No

[**q25b**] What work do you do for the mine? (select all that apply)

10. Engineer
11. Security
12. Machine operation/equipment operators

13. Administrative work
14. Food/services (ie: janitorial work, meal preparation, hotel operation for mining laborers)
15. Transportation (of mining goods or mining employees)
16. Community outreach/communication
17. Health professionals
18. Other

[q25b_9_text] Text box from "Other" option in q25b.

[q27] How many members of your family are employed by the mine/s in your community?

11. 0
12. 1
13. 2
14. 3
15. 4
16. 5
17. 6
18. 7
19. 8
20. 9
21. 10+

[q27a] What work do your family members do for the mine? Select all that apply.

10. Engineer
11. Security
12. Machine operation/equipment operators
13. Administrative work
14. Food/services (ie: janitorial work, meal preparation, hotel operation for mining laborers)
15. Transportation (of mining goods or mining employees)
16. Community outreach/communication
17. Health professional
18. Other

[q27a_9_text] Text box from "Other" option in q27a.

Questions about the impacts of Covid-19

[q11] The global pandemic has caused great difficulty and harm to families all around Peru and the world. In this section, we would like to ask you how Covid-19 has impacted your life and life goals.

Please select the statement/s below that are true **as a result of the Covid-19 pandemic** [select as many as apply]:

1. I lost my job
2. I became sick from Covid-19/The Corona Virus
3. Someone in my household lost their job
4. I had to postpone my further education
5. I completely changed my higher education plans
6. I had to postpone my career plans
7. I completely changed my career plans
8. I lost a family member or loved one
9. I have postponed marriage or cohabitating with my partner.
10. I have postponed having children.
11. I no longer desire to have children/more children.
12. Covid-19 has negatively impacted my mental health (examples: has cause anxiety, elevated stress and/or depression).
13. Covid-19 has not impacted me personally.

[**q11a**] In your own words, how would you describe how Covid-19 has impacted your future plans?

[**q12_1**] [**q12_2**] [**q12_3**] Please write three words that best describe your everyday life during the pandemic:

[**q28**] This is the last question. Is there anything else you would like us to know about the experiences of youth in Peru?

Appendix B: Survey Instrument (Spanish)

Información sobre la Encuesta y Consentimiento

[**consent**] ¡Gracias por su interés en nuestro estudio sobre las aspiraciones de los jóvenes! Buscamos jóvenes de entre 18 y 29 años para responder algunas preguntas sobre sus comunidades, las actividades escolares y laborales actuales y sus planes futuros. Sus respuestas nos ayudarán a comprender mejor los factores que influyen en el bienestar de los jóvenes y los resultados a largo plazo. Este estudio es parte de un proyecto de tesis de Carolyn Reyes, una estudiante de posgrado de la Universidad Estatal de Pensilvania en los Estados Unidos.

Si acepta participar, se le pedirá que responda una serie de preguntas en una encuesta. La encuesta tomará aproximadamente 20 minutos. Para algunas preguntas seleccionará una respuesta de una lista de opciones. Otras preguntas le pedirán que escriba su respuesta. Tu participación es completamente voluntaria. Usted puede optar por no responder a ninguna pregunta y puede detener la encuesta en cualquier momento.

A usted NO se le pedirá que proporcione ninguna información de identificación personal (como su nombre o documento nacional de identidad). El investigador solo verá un número de identificación aleatorio asignado a cada conjunto de respuestas y no podrá rastrearlas hacia usted.

Al final de la encuesta, le preguntaremos si le gustaría participar en una entrevista de seguimiento para dialogar más de los temas de esta encuesta. Si le gustaría participar en una entrevista virtual, le daremos un link a una encuesta diferente que le pedirá su nombre, número de teléfono y/o correo electrónico, y la provincia en la que usted vive actualmente. Esta información no estará vinculada con la encuesta que usted llenará en este momento y toda su información personal será descartada al final de la investigación. Si acepta participar en una entrevista, su identidad no será divulgada ni identificable en ningún informe futuro que escriba. Si usted cambia de opinión en cualquier momento puede decidir no participar en la entrevista.

Si tiene preguntas, inquietudes o comentarios adicionales, favor de comuníquese con:

<div style="text-align:center">

Carolyn Reyes
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Sociología Rural y Demografía
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</div>

Si desea continuar con la encuesta, haga clic en SI, SIGUIENTE

3. No, gracias
4. Si, siguiente

[**targetgroup**] ¿Tiene usted entre 18 y 29 años?

3. Si

4. No

[**thanks**] ¡Gracias por aceptar completar esta encuesta! Sus respuestas nos ayudarán a comprender mejor cómo les está yendo a los jóvenes de Perú como usted.

Responda las siguientes preguntas con la mayor sinceridad posible. ESTO NO ES UNA PRUEBA. No hay respuestas correctas o incorrectas y usted NO será evaluado en función de sus respuestas. Sus respuestas son completamente CONFIDENCIALES y ANÓNIMAS; esto significa que nadie sabrá qué respuestas proporciona ni quién es usted. Puede omitir cualquier pregunta que prefiera no responder o detener la encuesta en cualquier momento. ¡Gracias!

Preguntas sobre su estado actual de empleo y/o estudio y planes para el futuro

[**q1**] ¿Cuál de las siguientes opciones describe mejor su situación actual?

1. Empleado a tiempo completo, todo el año (8 horas al día / 40 horas a la semana o más)
2. Empleado a medio tiempo, todo el año (menos de 8 horas por día / menos de 40 horas por semana)
3. Empleado temporal (tiempo completo o medio tiempo)
4. Estudiante en un instituto superior o universidad a tiempo completo
5. Estudiante en un instituto superior o universidad a medio tiempo
6. Estudiante en un instituto técnico a tiempo completo
7. Estudiante en un instituto técnico a medio tiempo
8. Trabajando y estudiando al mismo tiempo
9. Terminando el colegio secundario
10. Terminando el colegio y trabajando al mismo tiempo
11. Ni trabajando ni estudiando

[**q1a**] ¿En qué trabaja (ejemplo: recepcionista, contable, agricultor)?

[**q1b**] ¿Tiene que viajar fuera de su comunidad por motivos de trabajo?

3. Si
4. No

[**q15b**] ¿Aproximadamente cuánto tiempo dedicas a viajar a tu lugar de trabajo?

1. Menos de 30 minutos
2. 30- 59 minutos
3. 1 hora
4. 2 horas
5. 3 horas
6. Mas de 3 horas

[**q1c**] Aproximadamente, ¿cuántos MESES al año está empleado?

13. 1
14. 2
15. 3
16. 4
17. 5
18. 6
19. 7
20. 8
21. 9
22. 10
23. 11
24. 12

[**q1d**] ¿Tiene que viajar fuera de su comunidad por motivos de trabajo?

3. Si
4. No

[**q15d**] ¿Aproximadamente cuánto tiempo dedicas a viajar a tu lugar de trabajo?

1. Menos de 30 minutos
2. 30- 59 minutos
3. 1 hora
4. 2 horas
5. 3 horas
6. Mas de 3 horas

[**q1e**] ¿Qué estás estudiando?

[**q1f**] ¿Tiene que viajar fuera de su comunidad para estudiar?

3. Si
4. No

[**q15f**] ¿Aproximadamente cuánto tiempo dedicas a viajar a tu lugar de estudio?

1. Menos de 30 minutos
2. 30- 59 minutos
3. 1 hora
4. 2 horas
5. 3 horas
6. Mas de 3 horas

[**q1g**] Que describe mejor su situación actual (seleccione todas las que corresponda):

5. Cuidando de su hogar (incluido el cuidado de niños, padres ancianos o abuelos)

6. Buscando trabajo
7. Preparación para estudios de educación superior
8. Otro

[**q1g_4_text**] Caja de texto de opción "Otro" en **q1g**.

[**q2**] Si pudiera elegir, cuál de las siguientes opciones describe mejor cuál le gustaría que fuera su situación en UN AÑO a partir de ahora: (seleccione todas las opciones que correspondan):

13. Empleado a tiempo completo, todo el año (8 horas al día / 40 horas a la semana o más)
14. Empleado a medio tiempo, todo el año (menos de 8 horas por día / menos de 40 horas por semana)
15. Empleado temporalmente (tiempo completo o medio tiempo)
16. Estudiante en un instituto superior o universidad a tiempo complete
17. Estudiante en un instituto superior o universidad a medio tiempo
18. Estudiante en un instituto técnico a tiempo complete
19. Estudiante en un instituto técnico a medio tiempo
20. Terminando el colegio secundario
21. Terminando el colegio y trabajando al mismo tiempo
22. formar una familia o tener hijos
23. Cuidando padres o abuelos ancianos
24. Otro

[**q2_34_text**] Caja de texto de opción "Otro" en **q2**.

[**q2a**] Por favor describa el tipo de trabajo que le gustaría realizar dentro de un año:

[**q2b**] Por favor describa lo que espera estudiar dentro de un año:

[**q3**] Si pudiera elegir, cuál de las siguientes opciones describe mejor cuál **le gustaría que fuera** su situación en **CINCO AÑOS** a partir de ahora: (seleccione todas las opciones que correspondan):

1. Empleado a tiempo completo, todo el año (8 horas al día / 40 horas a la semana o más)
2. Empleado a medio tiempo, todo el año (menos de 8 horas por día / menos de 40 horas por semana)
3. Empleado temporalmente (tiempo completo o medio tiempo)
4. Estudiante en un instituto superior o universidad a tiempo completo
5. Estudiante en un instituto superior o universidad a medio tiempo
6. Estudiante en un instituto técnico a tiempo completo
7. Estudiante en un instituto técnico a medio tiempo
8. Formar una familia o tener hijos
9. Cuidando padres o abuelos ancianos
10. Otro

[**q3_10_text**] Caja de texto de opción "Otro" en **q3**.

[**q3a**] Por favor describa el tipo de trabajo que le gustaría realizar dentro de cinco años:

[**q3b**] Por favor describa lo que espera estudiar dentro de cinco años:

[**q4**] Piense en cuando estuviste en la escuela por última vez (sin incluir la educación superior / universidad). ¿Qué querías hacer después de terminar la escuela?

[**q5**] ¿Qué crees que tus padres o cuidadores querían que hicieras después de terminar la escuela (sin incluir la educación superior / universidad)?

[**q6**] ¿Siente que ha logrado lo que quería hacer desde que dejó la escuela (sin incluir la educación superior / universidad)?

3. Si
4. No

[**q6a**] ¿Siente que logrará lo que quería hacer desde que dejó la escuela (sin incluir la educación superior / universidad)?

3. Si
4. No

[**q6b**] Por favor explique por qué cree que no hará lo que pensó que haría después de la escuela (sin incluir educación superior o universidad):

Preguntas sobre la migración y planes futuros de residencia.

[**q7**] Seleccione uno de los siguientes que mejor describa dónde vive?

5. Rural
6. Urbano
7. Centro poblado
8. Otro

[**q7_4_text**] Caja de texto de opción "Otro" en **q7**.

[**q8**] ¿Ha vivido siempre en la comunidad donde vive actualmente?

3. Si
4. No

[**q8a**] ¿Por qué te mudaste a tu comunidad actual?

1. Un trabajo
2. Escuela

3. Matrimonio o pareja romántica
4. Otro, por favor explique

[**q8a_4_text**] Caja de texto de opción "Otro" en **q8a**.

[**q8b**] ¿En qué año se mudó a su comunidad actual?

[**q9**] ¿Dónde vive ahora, cuantas personas en tu comunidad laboran en los siguientes trabajos o industrias?

_1. Agricultura
_2. Minería y extracción
_2. Turismo
_4. Servicios (hoteles, restaurantes, comercios, bancos)
_5. Sector público (educación, salud o trabajo social)
_6. Trabajo independiente

6. Ninguno
7. Pocos
8. La mitad
9. Casi todos
10. Todos

[**q10**] ¿Planifica hacer su vida en su comunidad actual?

3. Si
4. No

[**q10a**] ¿Dónde le gustaría vivir además de en su comunidad?

[**q10b**] Proporcione 1 o 2 razones por las que no planifica vivir el resto de su vida en su comunidad actual.

[**q10c**] Por favor explique por qué le gustaría hacer su vida en su comunidad actual.

Preguntas Demográficas

[**q13**] ¿En qué año naciste?

[**q14**] ¿Cuál de las siguientes opciones te describe mejor?

1. Hombre
2. Mujer
3. No me identifico ni como hombre ni como mujer
4. Prefiero no decir

[**q15**] ¿Cuál de las siguientes opciones describe mejor su estado civil?

1. Soltero
2. Casado
3. En una relación, comprometido pero sin casarse.
4. Conviviente
5. Divorciado o separado
6. Viudo

[**q16**] ¿Tiene hijos?

3. Si
4. No

[**q16a**] ¿Cuántos hijos tiene?

[**child1**] Edad del niño 1
[**child2**] Edad del niño 2
[**child3**] Edad del niño 3
[**child4**] Edad del niño 4
[**child5**] Edad del niño 5
[**child6**] Edad del niño 6
[**child7**] Edad del niño 7
[**child8**] Edad del niño 8
[**child9**] Edad del niño 9
[**child10**] Edad del niño 10

11. Menos de un año
12. 1 año
13. 2 años
14. 3 años
15. 4 años
16. 5 años
17. 6 años
18. 7 años
19. 8 años
20. 9 años
21. 10 años o mas

[**q17**] Seleccione cuál de los siguientes identifica como su identidad racial o étnica (seleccione todos los que correspondan)

1. Asiático
2. Mestizo
3. Indígena de los Andes
4. Nativo o indígena del Amazonas

5. Negro o Afrodescendiente
6. Blanco
7. Otro

[**q17_6_text**] Caja de texto de opción "Otro" en **q17**.

[**q18**] ¿Cuál es el nivel más alto de educación que completó?

1. Sin escolaridad
2. Algo de escolaridad primaria
3. Escuela primaria completada
4. Algo de educación secundaria
5. Escuela secundaria completada
6. Alguna formación en institutos técnicos
7. Escuela del instituto técnico terminada
8. Alguna formación universitaria
9. Universidad completada

[**q19**] ¿En qué provincia vives?

[**q20**] ¿Ha vivido siempre en esta provincia?

3. Si
4. No

[**q20a**] ¿En qué provincia vivía antes de su provincia actual?

Provincias codificadas como en **q19**

Si indican que viven o vivían en una provincia con actividad minera, contestarán las siguientes. Al contrario, contestarán preguntas q122 - q129

[q58] La provincia en la que vives o viviste tiene mucha actividad minera. En esta sección final, le haremos algunas preguntas sobre sus pensamientos y experiencias con la mina.

Califique el impacto de la minería en **su comunidad**.

_1. Impacto social
_2. Impacto económico
_3. Impacto ambiental

1. Muy malo
2. Malo
3. Sin impacto
4. Bueno

5. Muy bueno

[**q59**] Califique el impacto de la minería en **su vida**.

_1. Impacto de la minería en su vida

1. Muy malo
2. Malo
3. Sin impacto
4. Bueno
5. Muy bueno

[**q60positive**] ¿Ha notado alguno de los siguientes cambios en su comunidad? Por favor seleccione todas las respuestas que correspondan.

1. Crecimiento económico.
2. Menos personas viviendo en la pobreza.
3. Mejoras en la infraestructura escolar.
4. Más oportunidades de educación superior.
5. Más oportunidades de empleo para los jóvenes (de 16 a 30 años).
6. Mejoras en la infraestructura (carreteras, edificios, agua corriente, electricidad)
7. Aumento del turismo.
8. Aumento de personas que se mudan a la comunidad (crecimiento de la población).

[**q61negative**] ¿Ha notado alguno de los siguientes cambios en su comunidad? Por favor seleccione todas las respuestas que correspondan.

1. Decadencia económica.
2. Más personas viviendo en la pobreza.
3. Aumento de personas que se mudan hacia AFUERA de la comunidad (disminución de la población).
4. Aumento del crimen o delincuencia.
5. Menos oportunidades de empleo para los jóvenes (de 16 a 30 años).
6. Disminución del turismo.
7. Más personas empleadas en el trabajo sexual.
8. Daño al medio ambiente (por ejemplo: degradación de la tierra, contaminación del agua, etc).
9. Aumento de los impactos negativos en la salud (por ejemplo: más lesiones o muertes relacionadas con el trabajo, problemas de salud relacionados con la contaminación).

[q62] ¿Trabajas para la minería / una empresa minera?

[**q62a**] ¿Trabajas para la mina / empresa minera en tu comunidad o cerca de ella?

5. Si
6. No

[**q63**] ¿Considerarías trabajar para la mina o una empresa minera?

3. Si
4. No

[**q63a**] ¿Que trabajo realizas para la mina? (seleccione todas las opciones que correspondan)

1. Ingeniero
2. Seguridad
3. Operador de equipo u operador de máquinaria
4. Trabajo administrativo
5. Alimentos o servicios (es decir: trabajo de limpieza, preparación de comidas, operación de hotel para trabajadores mineros)
6. Transporte (de bienes mineros o empleados mineros)
7. Difusión o comunicación comunitaria
8. Profesional de la salud
9. Otro

[**q64b_9_text**] Caja de texto de opción "Otro" en **q64a**.

[**q66**] ¿Cuántos miembros de su familia están empleados el sector de minería?

22. 0
23. 1
24. 2
25. 3
26. 4
27. 5
28. 6
29. 7
30. 8
31. 9
32. 10+

[**q66a**] ¿Que trabajos realizan los miembros de tu familia para la mina? (seleccione todas las opciones que correspondan)

1. Ingeniero
2. Seguridad
3. Operador de equipo u operador de máquinaria
4. Trabajo administrativo
5. Alimentos o servicios (es decir: trabajo de limpieza, preparación de comidas, operación de hotel para trabajadores mineros)
6. Transporte (de bienes mineros o empleados mineros)
7. Difusión o comunicación comunitaria

8. Profesional de la salud
9. Otro

[**q66b_9_text**] Caja de texto de opción "Otro" en **q66a**.

Las siguientes preguntas están para los que no provienen de provincias con actividad minera.

[**q122**] **Peru tiene mucha actividad minera. En esta sección, te haremos algunas preguntas sobre tus pensamientos e opiniones sobre la minería.**

Califique el impacto de la minería en el Peru.

_1. Impacto social
_2. Impacto económico
_3. Impacto ambiental

6. Muy malo
7. Malo
8. Sin impacto
9. Bueno
10. Muy bueno

[**q123positive**] ¿Ha notado alguno de los siguientes cambios en tu comunidad? Por favor seleccione todas las respuestas que correspondan.

9. Crecimiento económico.
10. Menos personas viviendo en la pobreza.
11. Mejoras en la infraestructura escolar.
12. Más oportunidades de educación superior.
13. Más oportunidades de empleo para los jóvenes (de 16 a 30 años).
14. Mejoras en la infraestructura (carreteras, edificios, agua corriente, electricidad)
15. Aumento del turismo.
16. Aumento de personas que se mudan a la comunidad (crecimiento de la población).

[**q124negative**] ¿Has notado alguno de los siguientes cambios en tu comunidad? Por favor seleccione todas las respuestas que correspondan.

10. Decadencia económica.
11. Más personas viviendo en la pobreza.
12. Aumento de personas que se mudan hacia AFUERA de la comunidad (disminución de la población).
13. Aumento del crimen o delincuencia.
14. Menos oportunidades de empleo para los jóvenes (de 16 a 30 años).
15. Disminución del turismo.
16. Más personas empleadas en el trabajo sexual.

17. Daño al medio ambiente (por ejemplo: degradación de la tierra, contaminación del agua, etc).
18. Aumento de los impactos negativos en la salud (por ejemplo: más lesiones o muertes relacionadas con el trabajo, problemas de salud relacionados con la contaminación).

[**q125**] ¿Trabajas para la minería / una empresa minera?

7. Si
8. No

[**q126**] ¿Considerarías trabajar para la mina o una empresa minera?

5. Si
6. No

[**q126a**] ¿Que trabajo realizas para la mina? (seleccione todas las opciones que correspondan)

10. Ingeniero
11. Seguridad
12. Operador de equipo u operador de máquinaria
13. Trabajo administrativo
14. Alimentos o servicios (es decir: trabajo de limpieza, preparación de comidas, operación de hotel para trabajadores mineros)
15. Transporte (de bienes mineros o empleados mineros)
16. Difusión o comunicación comunitaria
17. Profesional de la salud
18. Otro

[**q126a_9_text**] Caja de texto de opción "Otro" en **q126a**.

[**q129**] ¿Cuántos miembros de su familia están empleados por la minería o empresas mineras?

33. 0
34. 1
35. 2
36. 3
37. 4
38. 5
39. 6
40. 7
41. 8
42. 9
43. 10+

[**q129a**] ¿Que trabajos realizan los miembros de tu familia para la mina? (seleccione todas las opciones que correspondan)

    10. Ingeniero
    11. Seguridad
    12. Operador de equipo u operador de máquinaria
    13. Trabajo administrativo
    14. Alimentos o servicios (es decir: trabajo de limpieza, preparación de comidas, operación de hotel para trabajadores mineros)
    15. Transporte (de bienes mineros o empleados mineros)
    16. Difusión o comunicación comunitaria
    17. Profesional de la salud
    18. Otro

[**q129b_9_text**] Caja de texto de opción "Otro" en **q129a**.

Preguntas sobre los impactos de Covid-19

[**q35**] *La pandemia mundial ha causado grandes dificultades y daños a familias en todo el Perú y el mundo. En esta sección, nos gustaría preguntarle cómo Covid-19 ha impactado su vida y sus metas de vida.*

De la siguiente lista, marca las alternativas que mas se acercan a tu realidad **como resultado de la pandemia de Covid-19** [seleccione todas las que correspondan]:

    1. Perdí mi trabajo
    2. Me enfermé de Covid-19 (coronavirus)
    3. Alguien en mi hogar perdió su trabajo
    4. Tuve que posponer mi educación superior
    5. Cambié completamente mis planes de educación superior
    6. Tuve que posponer los planes de mi carrera
    7. Cambié completamente los planes de mi carrera
    8. Perdí a un familiar o ser querido
    9. He atrasado o postergado el matrimonio o convivencia con mi pareja.
    10. He pospuesto tener hijos.
    11. Ya no deseo tener hijos o tener más hijos.
    12. El Covid-19 ha tenido un impacto negativo en mi salud mental (por ejemplo: ha causado ansiedad, estrés elevado o depresión).
    13. El Covid-19 no me ha impactado personalmente.

[**q36a**] En sus propias palabras, ¿cómo describiría cómo Covid-19 ha impactado sus planes futuros?

[**q37_1**] [**q37_2**] [**q37_3**] Por favor escriba tres palabras que describan mejor su vida cotidiana durante la pandemia:

[**q68**] Esta es la última pregunta. ¿Hay algo más que le gustaría que supiéramos sobre las experiencias de la juventud en Perú?

Appendix C: Interview Guide (Spanish)

Croquis de Entrevista semi-estructurado

Notas Para investigadora

Preguntas de investigación

1) ¿Comó explican los jóvenes sus experiencias y aspiraciones para el futuro?
2) ¿Cuales factores identifican los jóvenes que les restringe o apoye en alcanzar sus metas del futuro?
3) ¿De que manera influye el genero y la exposición a proyectos de minería de grande escala en sus experiencias vividas?

Fecha de Entrevista: _____

Nombre de participante: _____

Provincia de participante_____

Provincia con actividad minera?   SI   /   NO

Consentimiento

Buenos días/tardes/noches, soy Carolyn Reyes, un estudiante doctoral en el programa de Sociología Rural y Demografía en la Universidad del Estado de Pensilvania de los EEUU. Estoy realizando una investigación sobre el bienestar juvenil peruano y el impacto de la minería en el Perú, ante todo el impacto en el bienestar de los jóvenes. Es un proyecto independiente, no financiado ni vinculado con ninguna organización.

Estoy pidiendo tu participación en está investigación porque indicaste en mi encuesta en internet sobre el bienestar juvenil peruano que estarías interesado en participar en una entrevista de seguimiento. Voy a entrevistar 30 jóvenes como tu alrededor del país. La entrevista durará entre treinta minutos hasta una hora. Estas bienvenida a participar o no participar, o cambiar su mente en cualquier momento y parar la entrevista. Tu decisión no participar o no contestar cualquier pregunta no estará sostenido en tu contra.

Si estas de acuerdo a participar en una entrevista ahora conmigo, garantizo que tu identidad no estará discernible en ningún reporte que hago en el futuro. Cambiaré tu nombre, donde vives, y cualquier dato que te identifique en mis informes escritos.

Con tu permiso, voy a grabar el audio de nuestra conversación para poder recordar los detalles.
¿Tienes alguna pregunta sobre la información que acabo de leer?
¿Tienes alguna pregunta antes de empezar?

¿Tengo tú permiso empezar la grabación del audio?
¿Tengo tú permiso empezar la entrevista?
Entrevista

Muchas gracias por llenar mi encuesta virtual y también por tomar el tiempo para hablar conmigo hoy día. Me gustaría empezar con algunas preguntas sobre ti, tus experiencias y tus metas para el futuro. Después preguntaré sobre tu comunidad y, al final, sobre tus opiniones de la minería en el (<u>Provincia donde vives</u>) / Perú. ¿Hasta ahora, todo está claro? Muy bien, iniciaremos.

1. Para empezar, me gustaría que me cuentes un poco sobre ti.

- ¿Cuantos años tienes? (si no lo han mencionado)
- ¿A que te dedicas?
  - ○ ¿Podrías contarme como empezaste con este tipo de trabajo?
- ¿Estás actualmente estudiando?
  - ○ ¿Puedes contarme sobre como te interesaste en estudiar tal tema?
  - ○ ¿Hasta que nivel quisieras estudiar?
- ¿Cuidas familia o hijos?

- Siempre querías estudiar/trabajar _____ (lo que mencionaron antes)

- (si no esta actualmente estudiando) Cual es el nivel más alto de estudio que completaste?
  - ○ ¿Querías o te gustaría seguir estudiando?
    - ▪ Si - ¿hasta que nivel querías o quisieras estudiar? ¿Por qué?
    - ▪ No - ¿por qué no?

2. Ahora, me gustaría saber un poco sobre sus padres o las personas que te criaron.
- ¿A qué se dedican?
- ¿Siempre han hecho ese trabajo, o han cambiado sus carreras a través del tiempo?
- ¿Dónde nacieron?

3. Me gustaría preguntarte ahora sobre tu niñez:

- ¿Donde naciste?
- ¿Creciste en el mismo lugar? Si no, ¿donde creciste?
- (*si no viven en el mismo sitio que pusieron en la entrevista, pregunta*) Cuando mudaste a ____(actual provincia)? ¿Te has mudado más que una vez? ¿En cuales otros sitios has vivido y por cuanto tiempo?
- Me gustaría preguntar algo sobre las escuelas que asististe para primaria y secundaria?
  - ○ ¿Eran públicos o privados?
  - ○ ¿Eran grandes, pequeños?

4. ¿Cómo describirías tú niñez?
- ¿Eras feliz?

- ¿Hay algo que te hubiera gustado que fuera diferente?

Preguntas de Comunidad

Ahora me gustaría cambiar el tema un poco y preguntar sobre el lugar donde vives.

5. ¿Cuanto tiempo has vivido en la comunidad donde vives actualmente?

6. Por favor, cuéntame un poco sobre tu comunidad. Por ejemplo, ¿Qué es lo que hace destacar tú comunidad? *O* ¿Que es lo que hace a este lugar un lugar especial?
- ¿A qué se dedica la gente?
- ¿Se siente como un lugar seguro y/o tranquilo?
    - ¿Por qué si/no?

7. ¿A que se dedican los jóvenes en tu comunidad?   ¿Cuales oportunidades de empleo tienen?
- ¿A qué se dedica la mayoría de mujeres de tu edad? ¿Hombres?
- ¿Que factores crees que influyen en que la juventud tenga éxito en tu comunidad?
- ¿Crees que las oportunidades de trabajo y estudio son las mismas para mujeres y hombres jóvenes donde vives?
    - ¿Por qué si o por qué no?

8. ¿Te gusta vivir en tú comunidad?
- ¿Cuáles cosas te gustan/no te gustan sobre la vida allí?

9. ¿Te gustaría hacer tu vida a largo plazo en esta comunidad?
- ¿Por que si o por que no?
- (si no): ¿Cuál sería el sitio ideal para ti para hacer tu vida?

Preguntas sobre la minería

Ahora, voy a cambiar el tema un poco te preguntaré sobre el impacto de la minería en la zona donde vives o en el país.

10. ¿Puedes describir lo que sabes sobre la minería en tu región/en el país?
- ¿Qué opinas tu de la minería cerca de tu comunidad/en tu región?
- ¿Hay debates o diferencias de opinión entre la gente sobre la minería?
    - Si - Por favor, explica

11. ¿Trabajas o has trabajado para la mina/la industria minera?

Sí
- Puedes contarme sobre tu experiencia?
    - ¿Cuanto tiempo has trabajado / trabajaste para la mina?
    - ¿Cómo conseguiste el puesto que tienes / tuviste?
    - ¿Qué cosas te gustan y no te gustan sobre el trabajo que haces / hiciste?

No
- ¿Considerarías trabajar para la mina/industria minera en el futuro?
    - ¿Por que si? o ¿por que no?

12. ¿Piensas que la minería ha impactado tú vida?
- Si - ¿De que manera?
- No - ¿Podrías explicar un poco más por que piensas que la minería no tiene ningún impacto en tú vida?

13. ¿Hay oportunidades de trabajo para los jóvenes en la mina?
- Si - ¿Cuales tipos de trabajos existen en la mina para los jóvenes de tu comunidad?
    - ¿Cómo podría un joven conseguir un puesto de trabajo con la mina? (por ejemplo: ¿qué nivel de educación necesitarían? ¿que entrenamiento?).
- No - ¿Por qué no?

14. ¿Podrías describir qué tipo de trabajo una mujer joven podría conseguir en la mina? ¿Y de igual manera, que tipo de trabajo podría conseguir un hombre joven?

- (*si son diferentes*) - ¿Qué opinas de que las mujeres y hombres puedan conseguir trabajos diferentes en la mina? (en otras palabras: te parece justo que los hombres y mujeres consiguen trabajos distintas en la mina?)

- (*si dicen que más depende de su educación o que pueden conseguir los mismos trabajos*) - ¿Hay trabajos en la mina en que la mayoría de puestos están ocupados por hombres? Y de igual manera, ¿hay trabajos en la mina en que la mayoría son mujeres?

15. ¿Piensas tu que la minería tiene un impacto negativo o positivo en tú comunidad/en el Perú?
- ¿De que manera?
- ¿Podrías darme un ejemplo de un impacto positivo que pueda tener la mina sobre tu comunidad/el país?
- ¿Podrías darme un ejemplo de un impacto negativo que pueda tener la mina sobre tu comunidad/el país?
- (*si dicen que no habrá ningún impacto*) ¿Podrías explicar un poco más por que piensas que la minería no tiene ningún impacto en tú comunidad/el país?

16. ¿Piensas tu que la minería tendrá un impacto negativo o positivo en tú comunidad/ en el país en el futuro?
- ¿De que manera?
- ¿Podrías darme un ejemplo de un impacto positivo que pueda tener la mina sobre tu comunidad/el país en el futuro?
- ¿Podrías darme un ejemplo de un impacto negativo que pueda tener la mina sobre tu comunidad/el país en el futuro?
- (*si dicen que no habrá ningún impacto*) ¿Podrías explicar un poco más por que piensas que la minería no tendrá ningún impacto en el futuro de tú comunidad/el país?

Metas para el futuro

Ahora me gustaría preguntarte un poco sobre el futuro y lo que esperas para tu futuro. Estas son las últimas preguntas.

17. ¿Qué esperas para tu vida en el futuro?

- ¿Qué necesitas para poder lograrlo?
- ¿Que cosas crees que puedan impactar tú habilidad de alcanzar tus metas?
  - ¿Sientes que tú familia y amistades te apoyan? ¿De que manera? ¿Por qué no?
  - ¿Cuáles herramientas y/o servicios están a tu alcance para ayudarte a lograr tus metas para el futuro?
- ¿Cuáles factores o experiencias en tu vida han formado tus metas para el futuro?
- ¿Qué harías si no pudieras lograr estas metas?

18. ¿Qué opinan tus padres sobre tú trabajo / lo que estudias / tú situación actual de la vida?
- ¿Qué opinan sobre tus planes del futuro?
- ¿Había algún conflicto o diferencia de opinión entre tu y tu familia sobre sus planes para el futuro?

Fin de entrevista

Estas son todas las preguntas que tengo para ti. Muchas gracias por compartir tus experiencias, opiniones y tú tiempo conmigo. No tengo más preguntas. ¿Hay algo más que te gustaría compartir antes de terminar con la entrevista?

Appendix D: Survey Re-Coding Rules

Coding Rules for Survey Responses

Work Descriptions
Question text: *What do you do for work (example: receptionist, accountant, farmer)?*

0. Other
   - have my own business
   - In what I can
   - Restoring cultural artifacts
   - Artisan
   - Video and photography
   - Artist
   - Videographer
   - Military
1. Professional
   - Human Resources
   - Teacher
   - Municipality work
   - CEO
   - Biologist
   - Graphic design
   - Accounting assistant
   - Community relations supervisor
   - Analyst
   - Assistant (teacher, researcher, laboratory)
   - Communicator
   - Marketing
   - Administrator
2. Service
   - Assistant (no specification)
   - Reception
   - Client services
   - Business (sales)
   - Tourism Guide
   - Nanny
   - Caring for elderly
   - Dog trainer
   - Cook
   - Banker
3. Agriculture/Manual labor
   - Brick factory work
   - Production operator

- Construction
- Agriculture

Currently studying
 Question text: *What subject are you studying?*

0. Other
- Fine arts
- Computation / Informatics
- Pharmacy
- Culinary school
- Horticulture
- Languages
- Meteorology
- Social work
- Tourism

1. Administration / Management / Law / Accounting
- Public management
- Finance
- International relations

2. Science
- Bioengineering
- Nutrition

3. Social Science
- Political sciences
- Anthropology
- Sociology
- Economics
- Psychology

4. Engineering / Architecture

5. Nursing or Teaching

Work aspirations in 1 or 5 years
Question text: *Please describe the type of work you would like to be doing one year/five years from now:*

0. Other
- Hours per day
- University practice
- In the field
- Anything that pays
- Practitioner (nothing specified)
- Remote/tele-work
- Finish my degree
- In a job that I like
- Military
- Agricultural / manual labor (N = 7)

1. Technical / Professional / office work
- Engineering
- Investigator / Researcher
- Office work
- Supervisor
- Tele-work
- Lawyer
- Consultant

2. Social work/public service / environmental protection
- Running workshops
- NGO
- Teaching
- Nursing / doctor
- Environmental work
- Coaching
- Psychologist
- NGO work or work for the State

3. Sales/marketing/client-oriented (*for 5-year aspirations, coded into "other" due to low response rate, N = 2*)
- Receptionist
- Banking
- Client services

4. Own Business / Entrepreneur

Aspirations after HS

Question text: *Think back to when you were last in school (not including higher education/university). What did you want to do after finishing secondary school?*

0. Other / don't know
  - Help
  - Eat
  - Relax and rest
  - Mama
  - Have a house
  - Have a have and healthy life doing things that I enjoy
  - Art/music (N = 5)
  - Athlete (N = 7)

1. Work
  - Specific career (engineer, administrator, nurse, etc.)
  - Part-time
  - "work"

2. Study / go to university

3. Travel

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EDUCATION
2022	PhD, Rural Sociology & Demography, Penn State University, PA
2016	MS, Rural Sociology & Intern. Ag. and Development, Penn State University, PA
2009	BA, Environmental Policy and Practice & Cultural Anthropology, University of Toronto, ON

PUBLICATIONS
2019   Franklin Fowler, E., Baum, L.M., Jesch, E., Haddad, D., **Reyes, C**., Gollust, S.E., Niederdeppe, J. Issues Relevant to Population Health in Political Advertising in the United States, 2011-2012 and 2015-2016. *The Milbank Quarterly, 97*(4), p. 1062-1107, 10.1111/1468-0009.12427

2019   Greiner Safi, A., **Reyes, C**., Jesch, E., Steinhardt, J., Niederdeppe, J., Skurka, C., Kalaji, L., Byrne, S. Comparing in person and internet methods to recruit low-SES populations for tobacco control policy research. *Social Science and Medicine,* 242, 10.1016/j.socscimed.2019.112597

BOOK REVIEWS
2015   **Reyes, C.** Immigrant Farmworkers and Citizenship in Rural California: Playing Soccer in the San Joaquin Valley, by Hugo Santos-Gomez. *Rural Sociology*, 80(4), book review.

RESEARCH GRANTS & AWARDS RECEIVED
Spring, 2022	CAS Graduate Student Competitive Grants Program, 2021-2022, Penn State University ($3,000)
Jan. 2021	Rural Sociological Society Dissertation Research Award ($5,000)
Fall, 2020	Dr. Fern "Bunny" Willits Graduate Award Endowment in Rural Sociology ($2,000)
2018 - 2019	University Graduate Fellow, Penn State University
2015	World Food Prize Delegation Scholarship, College of Agricultural Sciences, Penn State University ($1,000)
2014	Graduate International Competitive Research Grant, College of Agricultural Sciences, Penn State University ($2,218)

PROFESSIONAL EXPERIENCE
2016 - 2018	Research Aide III, Dept. of Communication, Cornell University
2013	Special Project Coordinator, Environmental Management, Peace Corps Peru
2012	Program Coordinator, Environmental Management, Peace Corps Peru
2009 - 2011	Peace Corps Volunteer, Environmental Management, Peace Corps Peru

SOFTWARE SKILLS
- MAC OS and Windows
- Microsoft Office Suite
- STATA
- SPSS
- NVivo Qualitative Data Analysis Software
- Qualtrics

LANGUAGES
- Native English Speaker
- Fluent Spanish Speaking, Writing and Reading