The associations of cash transfers and childcare for the development of children born to adolescent and young mothers in South Africa.

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Thesis submitted in line with the requirements of a:

Master of Commerce: Development Economics

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Plagiarism Declaration

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Abstract

Exposure to adversities strongly predicts early childbearing among adolescent girls and young women. Early motherhood is associated with negative effects on their children's developmental outcomes, but the factors contributing to the well-being of children born to adolescent mothers remain uncertain. The Child Support Grant (CSG) emerges as a potential avenue of support. This paper analysed cross-sectional data of adolescent mother-child dyads (*N* =1,046 mothers; 1,144 children) from the Eastern Cape of South Africa, collected between 2017 to 2019. Adolescent and young mothers (aged 10-19 at the birth of their first child) completed questionnaires on their well-being and health. The Mullen Scales of Early Learning Composite Score was used to measure children's cognitive performance in expressive language, receptive language, visual reception, and fine motor domains. This study assessed factors associated with CSG receipt and early CSG receipt. Additionally, this study tested the association between CSG receipt and child development, and the moderating role of formal childcare. The results reveal socioeconomic factors such as having sibling, low maternal education and caregiver support to influence CSG access and timeliness. Moreover, both early CSG receipt and formal childcare had a significant positive effect on child development. To ensure timely access to CSG receipt, SASSA offices should run outreach campaigns targeting first-time adolescent mothers with low levels of education and intervention promoting caregiver support. There is also a need to develop flexible CSG policies that recognise the essential role of different family members and provide additional support. Social protection systems for children of adolescent mothers requires approaches that acknowledge the role of maternal human capital development in determining child outcomes and takes advantage of age-related opportunities for intervention.

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Note on Terminology

Adolescent recipient: Adolescent recipients refer to those children whose adolescent mother is their CSG recipient.

Caregiver recipient: Caregiver recipients refer to those children with the caregiver of the adolescent mother as the CSG recipient.

1 Introduction

Between 2017 and 2021, South Africa witnessed a notable increase of 48.7% in births to younger adolescents (aged 10–14 years) and 17.9% in older adolescent girls (aged 15–19 years), maintaining elevated adolescent fertility rates despite a decade of overall decline (The World Bank, 2022). These increases were particularly elevated following the COVID-19 pandemic, with delivery rates per 1,000 adolescent girls aged 10–19 years increasing year on year from 24.7 in 2018/19 to 27.8 in 2021/22 (Barron et al., 2022). The current rate, standing at 71 births per 1000 adolescent girls aged 15- to 19-years, is almost three times higher than in upper-middle-income countries (Dulvy et al., 2023). Early childbearing is linked with a greater risk of birth related complications and higher maternal and neonatal mortality (WHO, 2019). It is one of the leading causes of death in adolescents, with increasing health risks for younger girls, especially those between the ages of 10 – 14 years (Neal et al., 2012). The impacts of early childbearing extend beyond immediate health risks. There is growing recognition that the long-term socioeconomic disadvantage that young mothers' face can explain much of the association between early motherhood and poor health outcomes (Breheny & Stephens, 2010). Significant socioeconomic inequalities in young motherhood persist in South Africa, with adolescent girls from the poorest 20 percent experiencing a substantially higher birth rate (81 per 1000 girls) compared to their counterparts from the richest 20 percent (25 per 1000 girls) (Dulvy et al., 2023).

The relationship between young motherhood and socio-economic disadvantage is bi-directional, with intergenerational effects. Not only does early pregnancies frequently proceed from – and coincide with – severe early-life adversity (e.g. poverty, abuse, forced or transactional sex, and orphanhood), but these socioeconomic vulnerabilities reverberate to influence the development of their children (Neal et al., 2012;WHO, 2019). From conception, many children in South Africa are adversely affected by a range of social and economic inequalities that deny them their fundamental socio-economic rights to social services like healthcare and education, and to nutrition (Patel, 2023). Investing in early childhood development (ECD) programmes can play a key role in addressing the complex risk factors around child development for children born to young mothers by protecting children from poverty, inadequate health care, food insecurity, malnutrition and lack of education. However, the multidimensional nature of poverty that the majority of South African children face and its cumulative effects severely hinder efforts to promote their development (Slemming, Biersteker & Lake, 2024).

South Africa's Child Support Grant (CSG) is a successful mechanism to support children living in poverty and has proven effective in improving nutrition and in promoting health and education outcomes, with early and sustained access to the grant yielding the greatest lifelong returns (Aguero, Carter & Woolard, 2006; Dulvy et al., 2023; Hall & Budlender, 2023; Oyenubi & Rossouw, 2024; Slemming, Biersteker & Lake, 2024). The programme is well targeted at the poorest children and is delivered at scale, reaching 13 million children and their 7 million caregivers, most of whom are women (Slemming, Biersteker & Lake, 2024). Introduced in 1997, the CSG illustrates how the scope of a programmes can be extended over time with an increasing age threshold and expanding fiscal capacity (Hall, 2024). The CSG funds are often shared among members of the recipient's household and are not used solely for the child, supporting its affordability and social legitimacy (Zembe-Mkabile, 2023b). Nonetheless, poverty, inequality and unemployment challenges continue in South Africa and are notably gendered, with women continuing to take on disproportionate responsibility for care at home and in society (Patel, 2012).The lack of adequate and affordable early childcare and education services contributes substantially to these gender dynamics by restricting participation in income generation activities, particularly for young mothers (Cluver et al., 2024).

National policy frameworks in South Africa do prioritize the poorest children, but for African children residing in underserved rural areas and informal settlements, gaining access to quality ECD services remains challenging. Early learning programmes in South Africa's poorest communities face multiple systemic challenges characterised by poor infrastructure, an under qualified workforce, and registration barriers that prevent access to government funding. Only half of enrolled three-to four-year olds receive a quality of service sufficient to improve learning, highlighting the need for accessible, high-quality childcare (Slemming, Biersteker & Lake, 2024).ECD programmes have interlinking goals, and can have a wide range of benefits across multiple outcomes for vulnerable adolescent mother-child dyads, including in nutrition, food security, education, health and well-being (Ashley-Cooper, van Niekerk & Atmore, 2019a; Dulvy et al., 2023; Cluver et al., 2024). Even if the main goal is material support, state interventions that target several social needs can have transformative outcomes (Hochfeld, 2022). Given the critical importance of early childhood development and the significant role of the CSG in supporting young mothers and their children, this thesis addresses crucial gaps in our understanding of the CSG's implementation and effectiveness. Two key research questions are explored:

1) What are the barriers to and facilitators of CSG take-up among adolescent and young mothers, and how can exclusion be reduced?

2) What is the association between the CSG - both alone and when combined with formal childcare - and the cognitive scores of children born to adolescent and young mothers?

This study uses data from the first wave of the HEY BABY (Helping Empower Youth Brought Up in Adversity with Their Babies and Young Children) study, a prospective cohort study conducted in the Eastern Cape province of South Africa. Between 2017 and 2019, 1,044 adolescent and young mothers (aged 10–24 years) were interviewed, along with a cognitive assessment of their children (N = 1,137).

This thesis is structured into three Chapters following this introductory chapter. Addressing the first research question to identify and reduce exclusion for children of young mothers, Chapter 2 provides background on the broader structural inequalities that perpetuate poverty and inequality for young mother-child dyads and the context of social protection tools and programmes for youth in South Africa, as well as the implications for the learning and development of young children and girls in low-resource settings. Using multivariable regression this chapter explored the associated barriers – including indicators for child, maternal and household disadvantage – and facilitators –social provisions and support – that determine CSG take-up for children of adolescent and young mothers. The results reveal significant delays in CSG access for children born to adolescent mothers, with various socioeconomic factors influencing benefit access and timeliness.

To address the second research question on CSG effectiveness, Chapter 3 provides a comprehensive literature review of early childhood development programmes, providing more focus on the design and implementation features that shape their impact on child development in South Africa. There are certain aspects of the design and implementation of social protection, such as those around social norms at baseline, access and eligibility, adequacy of benefits and linkages to other services and systems, which impact the effectiveness of social protection in addressing the the multidimensional poverty that young mother-child dyads face and transform their lives. Linking CSG systems with childcare services would help to address the complex risk factors around child development for children born to adolescent mothers. Though the CSG is essential in addressing the prevention of deprivation, formal childcare can enable young mothers continued education and thus the promotion of income and capabilities and transform situations of injustice and exclusion. With children's Mullen Scale of Early Learning Composite Score as the dependent variable, a multivariable regression was used to explore child developments association with CSG access on its own, and when combined with formal childcare as a moderator. The findings indicate

that the CSG should be accessible with reduced delays to ensure positive outcomes for children born to young mothers.

Finally, Chapter 4 synthesizes the findings (with a focus on Chapter 3 results), lists the study's limitations, and discusses the studies implications for policy and practice. Across the stages of early childhood development and young motherhood, addressing inequities in the coverage and quality of social protection and childcare services is crucial for closing inequities in child outcomes and preventing loss of human capital potential. The results suggest that the possibility for social protection systems to respond to the needs of young mother-child dyads exceeds their current application. Formal childcare presents an entry point that when designed with the CSG system linkage feature could enhance the effectiveness of social protection for children of young mothers, but there is a need for future research on maternal outcomes and longitudinal change, as well as on additional programme design features and quality dynamics. Unless childcare systems are reformed, through gender-sensitive and age-responsive social services that are context-specific, adequately resourced, and aligned with removing discriminatory social norms, the systemic disparities and structural inequalities faced by young mothers will continue to perpetuate cycles of poverty.

2.1 Monitoring CSG Take-up for Children of Adolescent and Young Mothers

Adolescent and young mothers face numerous physical, social, and economic vulnerabilities – exacerbated by COVID-19 - that place their children at risk of poor development. The Child Support Grant (CSG) could serve as a crucial safety net during an extremely volatile and economically dependent period in young mothers' lives by providing financial assistance to alleviate socio-economic challenges for these families. Although benefits should be accessible with minimal delay to ensure positive outcomes, adolescent mothers tend to face challenges to timely CSG receipt (le Roux et al., 2019). This study aims to provide evidence to inform interventions aiming to support, young mother-child dyads. To do this, Chapter 1 first provides a comprehensive background and context for the study, exploring the structural inequalities that contribute to the persistent cycles of poverty and exclusion experienced by these young mother-child dyads in South Africa. The primary research question addressed in this chapter is: *What are the barriers to and facilitators of Child Support Grant (CSG) take-up among adolescent and young mothers, and how can exclusion from the system be reduced?* The chapter will use multivariable regression analysis to identify and explore the socioeconomic indicators influencing CSG take-up. This study hypothesizes that adolescent mothers face distinct barriers that contribute to delays in accessing the CSG. These

delays are hypothesized to stem from unique disadvantages tied to their socioeconomic and developmental circumstances, which differentiate them from other caregiver groups.

2.2 Background Literature

Despite noteworthy progress in reducing poverty since 1994, South Africa still grapples with persistent challenges related to poverty (Stats SA, 2019). With a gini coefficient of 0.65 in 2021, South Africa continues to be one of the most unequal countries globally. Amongst all countries with high unemployment, South Africa ranks first in the world. Growth has been weak and food inflation has been excessive (Ngubane, Mndebele & Kaseeram, 2023),with many facing economic hardship and struggling to meet their basic needs (Dlamini et al., 2023). The COVID-19 pandemic has worsened this situation (Spaull & Van der Berg, 2020). In South Africa, horizontal inequalities across race and geography continue to contribute to poverty and concentrate among women burdened with the care-responsibilities of families and children (Dulvy et al., 2023; Ngubane, Mndebele & Kaseeram, 2023). But, labour market inequalities in unemployment and skills development are increasingly now a main cause of poverty (Dulvy et al., 2023; Jackson & Yu, 2023).

This pattern of socioeconomic disadvantage is particularly pronounced among younger populations. In South Africa, young people face greater unemployment and higher levels of poverty. During their transition into adulthood, many young people are unable to acquire the necessary high-level skills and gain employment (Hochfeld, 2022). These challenges are persistent and often lead to life-long deprivation. The most affected by poverty in South Africa are those aged 0 – 17 years, followed by the 18 – 24-year age cohort (Stats SA, 2023a). Approximately 42 percent of young people between the ages of 15 and 34 are not in employment, education or training (Stats SA, 2023a). Youth unemployment is at 63 percent, compared to 32.6 percent of adults. When including discouraged job seekers, youth face a (broad) unemployment rate that exceeds 70 percent (greater than any other age group) (Stats SA, 2021). This reality is even starker for females. About 49 percent of females between the ages of 15 and 34 years are not in education, employment, or training (NEET) compared to 44 percent of males (Dulvy et al., 2023).

Amidst the economic polarization following apartheid, the concept of social exclusion becomes a valuable analytical tool, shedding light on horizontal inequalities that contribute to a nuanced understanding of poverty and inequality (Plagerson, 2023). Although services and infrastructure have improved significantly for black people following apartheid, 13.1 percent of South Africa's households, and in urban areas 17.9 percent, live in informal housing (Stats SA, 2019). Many

families who had been excluded from economic development for centuries remained in disadvantaged residential areas, engineered by the historic spatial policies of apartheid enforced on racial lines, with limited educational choices, infrastructural services and opportunities (Kubeka & Rama, 2021). Young people residing in these areas face a range of structural constraints – some perpetuated via educational institutions - leading to deprived capabilities and social exclusion (Kubeka & Rama, 2021).

Certain types of young people are at risk of facing long-term unemployment or intermittent unemployment in adulthood and lifelong poverty and deprivation. For girls and young women, the situation is especially challenging. In South Africa, around 33 percent of adolescent girls dropout of school following pregnancy (Dulvy et al., 2023). Young girls from poorer backgrounds are particularly vulnerable. Many are forced into intergenerational and transactional relationships to secure basic needs, and are often exposed to high levels of gender-based violence (GBV) (Mfeka-Nkabinde, Moletsane & Voce, 2023; Gebrekristos et al., 2020; Rammbuda, 2023). Employment for a large number of jobs is implicitly biased towards men, reflecting societal prejudices rather than their capabilities. One reason for employers' hesitancy in hiring young women is the belief that young women frequently fall pregnant and demand maternity leave (Kubeka & Rama, 2021). For those who do fall pregnant, early motherhood places a substantial barrier to the acquisition of human capital or work experience, as the demands of raising children are both costly and time-consuming (Ndwandwe, 2023).

These heightened levels of poverty are particularly pronounced in rural areas, with women- and youth-headed households being particularly impoverished. Many are dependent on state-funded social grants and social networks to meet their basic needs (Shahaboonin, David & Wyk, 2023). Grants are typically shared among members of the recipients' household and these informal sharing patterns underscore their centrality to normal social functioning. Old age pensions, for example, are not solely used on the elderly (Baehler, 2023). However, support networks and social connections are often not enough to lift people out of poverty entirely (Marais & Books, 2011).

In South Africa, the provision of childcare is not treated as a public good or human right. Consequently, there is no state obligation to provide childcare and there is little to no publicly funded services (Ashley-Cooper, van Niekerk & Atmore, 2019a). This lack of childcare services is a severe disadvantage for women. With childcare often costing as much as many women would earn, many women are unable to work, or they have to rely on private, informal care arrangements ((Banerjee & Duflo, 2019; Maharaj & Dunn, 2022). For young mothers, their aspirations and dreams

are often erased by the costs and time constraints of childcare responsibilities (Hochfeld, 2022). The COVID-19 pandemic has further amplified these pre-existing unemployment challenges and inequalities in the labor market. Job losses were unequally distributed across different groups in the labor market, with youth, women, the low-educated and people of color experiencing larger losses (Dulvy et al., 2023).Women experienced both pull and push factors out of the labour market, as many were forced to take up care responsibilities (Casale & Posel, 2021).

The feminization of poverty and challenges faced by the youth create a complex socio-economic landscape for young mothers and their children in South Africa. Because once young people have left school, they face a serious absence of meaningful opportunities, their transition into adulthood is often long and difficult (Jordan, Patel & Hochfeld, 2014). Young mothers are at greater risk of long-term unemployment because the caregiving burden restricts their access to opportunities in skills development or employment (Jochim et al., 2023a; Johnson, Smith & Butrica, 2023). At the intersection of young age, low socio-economic status, and gender inequality, underprivileged girls and those in rural areas face serious risk for multiple forms of deprivation and life-long poverty (Kubeka & Rama, 2021). These interconnected challenges disproportionately fall on children born to adolescent and young mothers, perpetuating poverty and inequality in South Africa.

Early Motherhood and Child Development

Globally, children of adolescent and young mothers are not reaching their full potential: They are more likely to experience poor development outcomes, poor nutrition, and school disruption or grade repetitions (Bozzoli, 2016; Habito, Morgan & Vaughan, 2021; Koenig et al., 2004). Children of adolescent and young mothers face unique challenges to successful development, as a result of growing up in poorly resourced households (Reed et al., 2022), lower educational achievement of their parents (Jochim et al., 2023), and lacking parental knowledge that facilitates their development (Erfina et al., 2019). While evidence from South Africa is limited, research suggests that children of adolescent mothers perform worse than average on cognitive development measures (Steventon Roberts et al., 2023a). Little is known about the protective factors of child development, with one exception showing that higher maternal education was associated with better child development (Steventon Roberts et al., 2023b).

South Africa also bears unique, interlinked challenges to good child development for children of adolescent and young mothers, characterized by exposure to risks such as poverty, violence and HIV and significant inequalities in health, education and income generating potential due to poorly developed support systems (Mekonnen, Dune & Perz, 2019). Children from lower-income

households encounter a wide variety of risk factors, including poor nutrition, illness, parental loss and family separation (Ashley-Cooper, van Niekerk & Atmore, 2019b), impeding on children's right to education, safety, security, nutrition and healthcare (Plagerson, 2023; Loss et al., 2024). Labour market inequalities, specifically lack of educational and employment opportunities, are now the main factors determining children's trajectory into poverty (Mdluli & Dunga, 2022; Kakwata, 2024).

Lower economic status and educational attainment is also associated with GBV, which is highly prevalent in South Africa (Datta, 2024). Although women encounter many forms of violence, they are commonly rooted in gendered power disparities, with poor and underprivileged girls particularly at risk (Frieslaar & Masango, 2021; Mthembu et al., 2021; Franchino-Olsen, Orkin & Meinck, 2024). Gender norms around sexual relations with men, such as those that are transactional or age-disparate, tacitly sanction violence (Pichon et al., 2024; Reed et al., 2024). Such gender norms compromise girls and young women's decision-making power and their sexual agency and leave them susceptible to heightened risk of HIV and pregnancy (Reed et al., 2022; Ninsiima et al., 2018). With the high prevalence of intimate partner violence in South Africa and given adolescents vulnerability, especially during pregnancy(Nyemgah, Ranganathan & Stöckl, 2024), adolescent mothers are at increased risk for psychological trauma and post-traumatic stress disorder (PTSD), leaving them vulnerable to further violence and exploitation (Decker et al., 2014; Filiatreau et al., 2022; Gebrekristos et al., 2023; Abdul Rahim et al., 2024; Murvartian et al., 2024; Nyemgah, Ranganathan & Stöckl, 2024).

This has implications for children (Ma et al., 2022; Mthembu et al., 2021), increasing their risk for developmental delays and delinquency (Bender et al., 2022; Evans et al., 2022; Steventon Roberts et al., 2023b; Abdul Rahim et al., 2024). For adolescent mothers in South Africa, PTSD symptomology correlates with child development scores, especially when mothers are also affected by HIV (Nöthling et al., 2013; Steventon Roberts et al., 2023b). South Africa's HIV prevalence rates are amongst highest in the world, with many of the structural determinants of adolescent pregnancy and motherhood, such as poverty, gender inequality and violence, also driving HIV infection (Mabaso et al., 2018; Jacobs & George, 2021; Jonas et al., 2023). Investigating the interaction of adolescent motherhood and HIV, Steventon Roberts and colleagues (2022) have shown that children of mothers living with HIV performed worse in gross motor tasks compared to those with HIV-negative mothers.

Social Provisioning and Youth in South Africa

Children and youth account for a substantial portion (about 35 percent) of South Africa's more than 62 million total populace. Of this expanding demographic, 5.8 million children are below 5 years old, and more than 10 million are adolescents between the ages of 10 and 19 years (Stats SA, 2023b). Although government spending on social protection and services amounts to half the national budget (Dulvy et al., 2023), one third of children live below the extreme food poverty line (UNICEF, 2023) and more than one fourth of children under 5 are stunted (Wand et al., 2024). In South Africa, the majority of children reside in households unfairly burdened by poverty and inequality, including those with more residents, female and youth household-heads, and limited educational experience. South Africa also houses the largest migrant population of children on the continent (UNICEF, 2023). These children often lack the documentation required to access essential state support.

COVID-19 has had an impact on children that goes further than poverty. With school closure, around 50 to 75 percent of primary school learners experienced lost learning and by mid-2021, 750 000 learners had dropped out of school (Shepherd & Mohohlwane, 2021). Caregiver distress rose with increasing unemployment and IPV, and so did child hunger, malnutrition and sexual abuse, exacerbating anxiety and distress (May, Witten & Lake, 2020; unicef, 2020).

The South African government has made significant progress in improving the rights and well-being of children since 1994. School enrollment is now nearly universal up to grade 9, and learning outcomes continue to improve (Dulvy et al., 2023). There have been steady improvements in the under-5 mortality rate (Achoki et al., 2022). HIV/AIDS mortality has declined rapidly since 2007 and new HIV infections in 15 to 49 year olds experienced a reduction of 73 percent relative to the 2019 pre-intervention expected incidence (Johnson et al., 2022). The fiscal policy of South Africa, with its progressive taxation and redistributive cash and in-kind transfers, has been pivotal in mitigating inequalities and alleviating poverty (Dulvy et al., 2023).

Public spending in 2021/22 on education, social protection and health expenditure accounted for 20, 18 and 12 percent of the total public sector budget and made up 6.5, 5.7 and 4 percent of South Africa's GDP, respectively. While this level of spending exceeds that of many UMICs, South Africa's large and expanding youth demographic, heavy disease burden, and historic inequalities in service provisions means that government spending needs to be maintained or even increased (Dulvy et al., 2023).

Early Childhood Development

Early childhood development represents a critical investment opportunity in South Africa's response to poverty and inequality. Early childhood builds the foundational capabilities for subsequent, lifelong skill attainment, and should be prioritized in any state response to poverty and inequality. The period from pregnancy to age 5 has fundamental developmental importance for future health, education and economic productivity (Dulvy et al., 2023). Children's development during this time has lasting implications for an individual's successful transition from childhood, through adolescence, into adulthood (Edmond et al., 2019; Darling et al., 2020; Draper et al., 2023). This has broad community- and societal- consequences, with unsuccessful transitions associated with poor health and well-being outcomes. Such outcomes perpetuate cycles of poverty and have wider implications for the growth of regional, national, and global economies(Richter et al., 2017). In 2021, approximately 2.2 million children 0-5 years old were attending an early learning programme, including a nursery, creche, day mother, playgroup or preschool, while 750 000 attended Grade R or Grade 1 (Department of Basic Education, 2022). Older children are more likely to attend centre-based programmes with 69 % of 3-5 year olds in a learning programme or Grade R, many younger children - 70 percent of 0-2 year olds - are being cared for at home (Ebrahim, Seleti & Dawes, 2013; Thorogood et al., 2020). However, with the rising cost of living, many mothers are forced to work outside of the home and often soon after birth (Slemming, Biersteker & Lake, 2024). Many mothers have no choice but to resort to informal care arrangements, with the most common forms being free of charge childcare provisions from families and friends or neighbours or -typical in many informal communities - they use home-based childcare accessed through providers, typically women, who care for children at home (Bernardi & Mortelmans, 2018; Majola, Dunn & Maharaj, 2023).

Providers of home-based childcare generally do not make a livable wage and find the provisions of nutritious food, age-appropriate stimulation, and adequate infrastructure difficult. Not only has the government funded ECD food subsidy for eligible children been frozen at R17 per day, but the complicated requirements for registration are often unattainable and leave many children without access to the subsidy (Thorogood et al., 2020). Operating outside any legal framework, the essential service that these women provide is not recognised by the state, leaving the industry and many children unprotected. There are more than a million children who are in unregistered ECD programmes without government support, and the amount is inadequate, leaving many providers struggling to feed children, pay salaries and provide quality services (Horwood et al., 2021; Wills & Kika-Mistry, 2021; Clark et al., 2024).

The support that families receive at home is also not adequate. Home- and community-based programmes are critical when considering the practical difficulties of poor families to send their children to formal ECD centres. The challenges to access that adolescent and young mother-child dyads face might be disproportionate when considering their high-costs, remoteness of geographic location, and services hours which are not compatible with school hours (De Henau et al., 2019; Devercelli & Beaton-Day, 2020). In South Africa, home-based care has been significantly associated with child stunting and overweight among children (Sello et al., 2023). While centre-based programmes are a helpful entry point for social provisioning to young children who are no longer regularly attending clinics, there is a need to consider how programmes can adequately support children being cared for at home (Thorogood et al., 2020).

Investments early in life that start in pregnancy and are sustained into adolescence generate the greatest returns (Tomlinson, Kleintjes & Lake, 2022). Despite the severe and largely irreversible physical and neurocognitive damage of stunting in early childhood (de Onis & Branca, 2016), nearly 80 percent of early nutrition financing is allocated to children who are 5 years and older, through the National Nutrition Program targeting children attending formal education (Dulvy et al., 2023). Similarly pregnancy entails a heightened demand for nutrition to support the growing fetus, and substantial costs for accessing essential services, such as healthcare (e.g. transport and childcare for additional children) (Chersich et al., 2016). The CSG provides R510 per month for children from birth up to 18 years (Government of South Africa, 2023), with the main objective to enhance early childhood education and health outcomes by targeting issues of early malnutrition, hunger, and financial barriers to essential services. However, commencing support only after the child's birth misses the window of opportunity to mitigate the developmental impacts – for both the young mother and child - of maternal deprivation during pregnancy (Chersich et al., 2016; Moolla et al., 2024).

Adolescent and Youth Development

Following early childhood, adolescence is a second sensitive period in neurological development, characterised by rapid cognitive, emotional and psychosocial change (Gee et al., 2018; Giedd, 2018). Marked by sensitivity to the social environment, adolescents experience progressive growth in their understanding of social life and their ability to think deeply and broadly about social experiences (Telzer, Kwon & Jorgensen, 2022). The current psychological and neurobiological evidence suggests that we cannot deeply think about things that invoke no emotion. Our

development depends on how we feel and we develop the capacity to engage with and interpret our gut feelings within social experiences through social learning (Immordino-Yang et al., 2023).

While emotions are central to the developing capacity for transcendent thinking, the amplified emotional costs associated with social exclusion during adolescence can hinder learning (Immordino-Yang et al., 2023). Adolescence is characterized by concern in relation to the norms, values, and expectations of those that surround them and in securing acceptance (Brown & James, 2009). Compared to children and adults, adolescents have been found to exhibit increased emotional reactions to experimentally manipulated social inclusion and exclusion and have been found to react with decreased mood and increased anxiety to peer rejection (Moor et al., 2010). It is the social value attributed to a context that determines differences in learning between different groups of people. For instance, one study found that for a group of mid-adolescents aged 8 to 12 years, those who were traditionally schooled experienced negative emotions following errors. Not stymied by negative emotions, Montessori schooled youth grew to be more effective learners because they took more risks and used mistakes as opportunities to learn (Denervaud et al., 2020).

Brain development during mid-adolescence is shaped by social and cognitive experiences, determined by socioeconomic status and culture, education and peers (Immordino-Yang & Yang, 2017; Galván, 2021; McCormick et al., 2021). However, adolescents are also active participants in their own development. Their proclivity to make meaning of their experiences shape the neural architecture crucial for identity development, predicting long-term psychosocial growth and well-being (Immordino-Yang et al., 2023; Gotlieb, Yang & Immordino-Yang, 2024). The developing capacity for transcendent thinking could provide adolescents with essential tools to interpret and manage their emotions in the face of heightened social evaluation and make thoughtful, self-directed choices in their complex social landscapes (Immordino-Yang et al., 2023). Critically, adolescents' development and learning were found to depend less on demographic factors such as socioeconomic status. Rather, young people's proclivities to feel deeply and engage in complex thinking about civic and personal issues seemed to play a more significant role (Gotlieb, Yang & Immordino-Yang, 2024). Such findings highlight the emergent potential of youth, and the important developmental assets of transcendent social thinking and identity for underprivileged young people navigating complex socio-economic circumstances (Gutiérrez, 2008; Nasir et al., 2021; Brocas et al., 2024).

The benefits of an education system that support the emergence of intellectual agency in adolescents and a disposition of mind that values epistemological complexity in social, civic and

scholarly content have been well-established (Daniel, Quartz & Oakes, 2019; Lee, White & Dong, 2021; Nasir et al., 2021; Immordino-Yang et al., 2023; Schnitker, Balkaya-Ince & Houltberg, 2024). To produce lasting benefits, schooling should not shy away from teaching about the diverse experiences of people within social, cultural and historical contexts, be it through race, gender identity or labour practices. School, community and parenting programmes that revolve around adolescent's emergent developmental capacities to make culturally relevant meanings of their social life and shape their identity can enhance educational outcomes (Daniel, Quartz & Oakes, 2019;Gutiérrez, 2008; Yeager & Walton, 2011) and lead to an increased sense of purpose in life, improving health and wellbeing (Riveros et al., 2023;Miller et al., 2014).

School enrollment in South Africa is nearly universal up to 9 years of basic education (Lund, 2011; Dulvy et al., 2023), but it is often of poor quality, with persistent problems in textbook non-delivery, extended teacher strikes and teacher absence, prevalent bullying, corporal punishment, sexual abuse and coercion, and poor marks in maths and science (van der Berg, 2008; Chitsamatanga & Rembe, 2020; Bhana, Singh & Msibi, 2021; Dulvy et al., 2023). Children are often held back, mainly due to poor learning performance, resulting in a large proportion of learners that are over-age for their grade. Many children, especially boys, dropout early, with dropout rates in Grade 10 and 11 estimated at 11 percent in 2018 (van der Berg, Patel & Bridgman, 2022). Since the start of the COVID-19 pandemic it is estimated that the proportion of out-of-school children aged 7-17 years has increased from approximately 2 to 6-7 percent (Shepherd & Mohohlwane, 2021). While nearly all learners access 9 years of education, in 2020 only 74 percent of girls and 60 percent of boys reached Grade 12 (Dulvy et al., 2023). Moreover, the majority of learners who are able to reach and complete Grade 12 are unable to transition into higher education, with only 36.4 percent attaining the minimum required mark for entry into university.

The stratification of education into low resourced no- or low-fee paying and high resourced fee-paying systems has reproduced inequalities in South African schools and in society (Ngobeni, Chibambo & Divala, 2023). While 75 percent of public schools are no or low-fee, only 20-25 percent of schools are functional fee-paying schools. In South Africa, the inequalities in quality education are stark, with 3 percent of high schools achieving more distinctions in mathematics than the 97 percent that are left (Spaull & Jansen, 2019). While better-quality education is critical for enhancing opportunities for children in South Africa to improve their life, particularly in marginalized communities; most children are left excluded from the provision of higher quality programmes or made to feel as if they do not belong and will not succeed (Mgqwashu et al., 2020).

Concerningly, per capita spending has decreased over recent years, despite real expenditure rising by 3 percent (van der Berg, Patel & Bridgman, 2022). For instance, while only few South Africans make it to higher education, this sub-sector makes up a disproportionate share of the education sector budget. With an upwards trend in 2021/22, 76 percent of what was spent on basic education comprised employee compensation consisting mainly of salaries and benefits for teachers. This allocation did not translate into improved outcomes in students' learning, with the system still facing difficulties to draw in high quality professionals into teaching. With limited knowledge of content and pedagogical skills and with weak systems to hold them to account, schools are failing to motivate teachers to perform or even attend class (Dulvy et al., 2023).

Education is necessary for the social and economic empowerment of girls and young women, providing the tools, skills and credentials necessary for labour force participation (Datta, 2024b). Through education girls can develop the critical thinking skills required to analyse situations, question their own and other perspectives, and make independent and informed decisions. Through engaging in such thinking, girls can become more conscious and aware, more confident and independent. Education and economic participation enable women to engage in critical reflection about their future plans, voice their needs and dreams, express their emotions and imagine a different future, motivated by the hope for a better life (Hochfeld, 2022). However, the system design meant to support youth development and learning does not align with youths' developmental needs and emergent capabilities, undermining their potential and wellbeing. Ignorant of youths need for competence, autonomy and belonging (Patall & Zambrano, 2019) young people who are not succeeding in school and feeling disempowered experience increased surveillance and control, with schools often narrowing their options and opportunities for care; instead resolving to discipline and scrutinize them (Nasir et al., 2021).

Youth Development and Disadvantage

Adolescence and young adulthood (between 10–24 years) is a period when individuals must simultaneously undergo intensive identity work, attain the skills required to successfully navigate future challenges, and make critical decisions about their education, health, relationships, and economic participation. Driven by increased exploratory tendencies, adolescent development occurs within a context of decreasing parental supervision and strong peer influence (Pozuelo et al., 2020). Youth also experience heightened health and wellbeing risks, including school drop-out, early pregnancy and marriage, risky sex, and GBV (Rogers et al., 2024). While the learning and

development that occurs in adolescence make them particularly vulnerable to environmental influences, it is also a period of opportunity for intervention (Pozuelo et al., 2020).

The developing capacity to engage in transcendent thinking could support adolescents' growing capacity to navigate increasingly complex social landscapes. For instance, research suggests that future directed mentalizing - engaging in critical thought about beliefs and issues that transcend immediate sensations and the present moment - could make individuals more patient (Rosenbaum & Hartley, 2019). This could help to protect young mothers from risk, with greater impatience in adolescent girls found to be associated with having more sexual partners (Thomas et al., 2024). However, an adolescent who is willing to engage in such future-directed thinking is likely emotionally compelled to do so (Rosenbaum & Hartley, 2019; Immordino-Yang et al., 2023).

South Africa, with its legacy of brutality and discrimination, has left many historically disadvantaged youths facing socio-economic hardship and psychosocial strain. This can compromise their learning and development. High-stakes and uncertain surroundings tend to prioritize immediate survival needs over long-term considerations and can create apathy towards engaging in spontaneous future-directed thought (Tomas et al., 2022). In South Africa, the collection risk of delayed rewards (for instance, in education) are high for disadvantaged youth living in high-risk impoverished environments (Rosenbaum & Hartley, 2019). With many students who have graduated from university still struggling to find work, the majority of youth who have been excluded from access to higher quality programming often have little hope to improve their lives (Hochfeld, 2022).

Hopelessness and other factors with mental health implications have been connected with the risky behaviour and decision making of youth (Desmond et al., 2019; Ngwenya et al., 2021) and the sexual reproductive health of adolescent girls and young women (Groenewald, Isaacs & Qoza, 2023). Hopelessness, distress and depression has been associated with unintended pregnancies; and emotional challenges and poor mental health also shares a relationship with adolescent pregnancy (Duby et al., 2021). Greater levels of hope can enhance the self-esteem, self-worth and self-care agency of youth (Canty-Mitchell, 2001; Marques, Lopez & Pais-Ribeiro, 2011). Conversely, low self-esteem has been associated with social isolation and has been described by young women as the repercussion of relationships with violent and controlling sexual partners. These findings highlight the interdependency of hope, self-esteem and mental wellbeing and the sexual and reproductive health rights of young mothers (Duby et al., 2021).

Like many youth in South Africa, disadvantaged young mothers may feel little hope for real and appreciable change in their circumstances. Since they may not have a sense that they can reach their goals, they might have little to motivate them to 'imagine' possibly different futures (Hochfeld, 2022). Without hope motivating them to pursue their goals, the hopelessness of their situations can erode their will and resources available to try (Duflo, 2012). It is rational to respond to poverty with hopelessness and inaction. Similarly, it is rational to fear losing the limited available resources one has. The repeated and idiosyncratic or systematic failure of every action towards one's goals can leave a person pessimistic and stressed, with little energy to expend effort or cash towards changing one's life (Devereux & McGregor, 2014).

In an informal settlement in South Africa, Graham and Patel, (2012) found that resident young people struggled to express their aspirations, with many giving little thought towards their futures. They did not believe that their life could change appreciably. Instead of listing clear goals towards realistically shaping their long-term future, they talked about vague and unachievable dreams, such as driving a nice car or living in a nice house. It was particularly challenging for young women to think about their future and express aspirations and goals outside of getting married or securing a long-term relationship with boyfriends, typically through having their partner's child. Most of these young women were already mothers.

A youth developmental approach does not view youth as a distinct and transient phase through which all young people progress. There are no concrete steps one must follow, and it is not experienced in the same way. Rather, it is seen as a life stage where youth undergo extensive identity development (Graham, 2012). A concerning but common phenomenon young mothers experience is the obstruction and overshadowing of their youthful identity and its accompanying needs and desires by their role as mother and caregiver (Razavi, 2011; Pope et al., 2022). The prevailing perception of childcare as a wholly domestic responsibility, primarily attributed to mothers, means the dimension of 'motherhood' is often deemed irrelevant to the economy when considering female workers, regarding the care arrangement for their children as a 'private' matter, and not recognising the state provision of day-care services as a public good. While older mothers may be better able to navigate these inequalities, the aspirations and dreams of young mothers are frequently effaced by the exigencies of child-rearing and their financial constraints in meeting childcare expenses (Maharaj & Dunn, 2022; Nzima & Maharaj, 2023; Plagerson, 2023).

Despite low- and middle-income countries' reliance on cash transfers programmes for the expansion of social protection amongst the most poor and vulnerable, children and adolescents

have been largely excluded. Protecting against school absence, food insecurity and violence (Baird et al., 2014; Peterman et al., 2017; Hidrobo et al., 2018), cash-transfer programmes have shown to improve health and wellbeing outcomes among adolescents. Many programmes have given adolescents direct access to cash as an incentive to reduce transactional sex, multiple sexual partners and delay sexual debut, and promote other behaviours that support future health and wellbeing (Cluver et al., 2013; Handa et al., 2014; Rosenberg et al., 2014; Pettifor et al., 2016; Pozuelo et al., 2020; Gangaramany et al., 2021; Groves et al., 2024; Rogers et al., 2024). For instance, in a study on the impact of cash transfers on physical intimate partner violence and sexual relationships among adolescent girls and young women in rural South Africa, Groves et al. (2024) found that cash transfers reduced adolescent girls and young women's risk of experiencing intimate partner violence. However, different types of people have different experiences of poverty and deprivation.

The poverty and deprivation that adolescents, girls and women face is not simply a consequence of a lack of income. Like many adolescents in South Africa, young mothers commonly experience polyvictimization - exposing them to multiple and varying types of violence (Kaminer et al., 2013). In South Africa, the receipt of social benefits, including household receipt of the CSG, free schooling and meals at school, has not been found to be protective against any level of polyvictimization experienced by adolescents (Franchino-Olsen, Orkin & Meinck, 2024). Despite this, material support like cash transfers can be a useful entry point in support for those experiencing violence. For instance, Kodikara, (2018) found that IPV victims preferred applying for food assistance rather than turn to legislation like maintenance in order to avoid stigma.

2.3 Social Assistance in South Africa and the CSG

Fundamental changes to social policy had taken place in South Africa's 1994 transition from Apartheid (Taylor, 2023). While confronting numerous challenges in their transition to a rights-based, developmental approach, the state of South Africa has dedicated themselves to social transformation. This has been enshrined in the constitution of the Republic of South Africa as a fundamental commitment to "a comprehensive social protection system" (Huijbregts, Spadafora & Patel, 2023; 386). In South Africa, everyone unable to support themselves or their dependents is granted the right to social security, such as social assistance (Section 27 No.13 of 2004). This is a high-level right that has also been set forth in the Social Assistance Act of 2004, allowing all citizens to enforce this right through the state's legal system (No. 13 of 2004).

South Africa's fiscal spending on broad social protection measures is extensive compared to other low-and middle-income countries (The World Bank, 2022). Reaching families at scale, South Africa's social assistances programmes represent one of the more successful efforts towards poverty reduction and resilience building and accounts for a large proportion of the social protection systems budget and coverage (Docrat et al., 2019; Moore & Seekings, 2019; Köhler & Bhorat, 2021; Dulvy et al., 2023; Huijbregts, Spadafora & Patel, 2023).

South Africa's social assistance system consists primarily of tax-funded, unconditional, and mostly means-tested social grants, including the child support grant for children under 18 years, the old age pension grant for those older than 60 years and a disability grant. These social grants make up a large portion of total public expenditure (Van Heerden, Horridge & Suarez-Cuesta, 2024). One in every three people (benefiting 11.97 million individuals) and approximately half of households in South Africa have access to social grants, which makeup a significant proportion (24.4%) of household income (Stats SA, 2023b).

With the onset of democracy, social grants expanded from 2.5 million in 1998 to approximately 19 million grants paid monthly in 2024 (sassa, 2020;sassa, 2024), a major expression of the post-apartheid governments pro-poor and redistributive policies. The deracialising of the CSG was the primary contributor to this rapid expansion of coverage (sassa, 2020; Gronbach, Seekings & Megannon, 2022). However, there remains critical gaps in the coverage of social protection in South Africa, with millions who are living in poverty without access to income support (Van Heerden, Horridge & Suarez-Cuesta, 2024).

The Child Support Grant

The CSG is a monthly means-tested state-funded unconditional cash transfer of R510, designed to provide financial assistance to low-income families raising children (Government of South Africa, 2023). Aimed at the poorest segment of society, beneficiaries of the grant are more likely to live in rural areas, experience more community violence, and live in households in the lowest wealth and income quintiles, with more household members and greater monthly grant income compared to those households not receiving the grant (Garman et al., 2022).

In 2021, the grant reached 13 million disadvantaged children through their primary caregiver (Hall, 2024). Caregiver recipients are mostly women (96%) and are typically the child's biological mother or grandmother (de Koker, de Waal & Vorster, 2006). Caregivers are eligible for receipt of the grant if they have South African citizenship or permanent residence, are 16 years or older and do not earn more than R52,800 per year, if they are single, or R105,600 if they are married

(Government of South Africa, 2023). Children of mothers under the age of 16 years must access the grant through their mother's caregiver (Social Assistance Act No. 13 of 2004), who may also be the grant recipient for their adolescent child (children under the age of 18 years are eligible for the grant).

There is well-established evidence of the wide-ranging health benefits for children when their caregivers receive cash transfers. These benefits encompass improved educational and health outcomes, reduced sexual risk behaviours, delayed first pregnancies, enhanced food security and child nutrition (Aguero, Carter & Woolard, 2006; Rosenberg et al., 2014; Handa et al., 2015; Gibbs et al., 2018), while female caregivers may also experience health benefits, encompassing an increase in autonomy and a reduction in experiences of violence (Wright et al., 2014; Ngamasana & Moxie, 2024; Wong & Forget, 2024). Although this small amount of cash is insufficient to fully protect against the worst outcomes of stunting and malnutrition(Govender, Taylor & Naidoo, 2020; Hall, Proudlock & Budlender, 2023; Zembe-Mkabile, Ramokolo & Doherty, 2023), it provides financial support to adolescent and young mothers to fund the costs associated with raising children (Granlund & Hochfeld, 2020).

While the coverage of the CSG is extensive, there are notable challenges that warrant attention. The slow uptake of the grant for young children is a major concern. In 2020, 48.3% of infants under a year old who were eligible for the CSG did not have access to it (UNICEF, 2022). Moreover, despite the intention to prioritize the most disadvantaged groups, the estimated coverage of the CSG is relatively lower for children in families facing extreme poverty. For instance, the coverage is 74 percent for children in families with household incomes estimated between R799 to R1,799, compared to 87 percent for those with incomes between R1,799 to R2,499 (Dulvy et al., 2023). High rates of early pregnancies in South Africa raise concerns about challenges faced by adolescent and young mothers in accessing the CSG, with obstacles including age restrictions and caregiver loss (mothers under the age of 16 years must access the grant through their caregiver; Social Assistance Act No. 13 of 2004). Adolescent mothers in South Africa have been found to experience delays in CSG access compared to their adult counterparts, with implications for accessing health services and ensuring food security (Le Roux et al., 2019).

Timely access to unconditional cash transfers profoundly impacts child development during critical periods (Aguero, Carter & Woolard, 2006; Rosenberg et al., 2014; Handa et al., 2015; Baird, McIntosh & Özler, 2019). Research in South Africa shows that accessing the CSG, especially early in life, significantly enhances developmental outcomes from birth to adulthood, including

improved education and health outcomes (Marteleto, Lam & Ranchhod, 2006; DSD, SASSA & UNICEF, 2012, 2016; Eyal & Woolard, 2013; Eyal & Njozela, 2016), particularly for those whose mothers have more than eight years of schooling (DSD, SASSA & UNICEF, 2016). Adolescent beneficiaries also benefit from improved schooling and reduced risky behaviours compared to non-beneficiaries (DSD, SASSA & UNICEF, 2016; Baird, McIntosh & Özler, 2019).

The CSG influences child development through various pathways, including providing resources for food, clothing, school uniforms, daycare, and transportation costs (Bhana & Nkani, 2016; Khosa & Kaseke, 2017; Ngubane & Maharaj, 2018). Early access enables access to vital nutrition for cognitive development (Lindsay et al., 2019; Sherr et al., 2020, 2021a) and facilitates childcare support, essential for adolescent mothers' return to school (Jochim et al., 2022).

However, barriers to early CSG access for adolescent mothers persist, including eligibility uncertainties, documentation requirements, and institutional challenges (DSD, sassa & unicef, 2016; UNICEF, 2022). Age restrictions prevent mothers under 16 from applying directly (Social Assistance Act No. 13 of 2004), and societal challenges such as stigmatization, diminished status, and early marriage also hinder access (Holmes et al., 2020). Unwarranted stigma surrounds young mothers receiving the CSG, who might feel discouraged or limited to access the grant for claims that the grant encourages repeat pregnancies (Jordan, Patel & Hochfeld, 2014).

To overcome these challenges, some children may be able to access the grant through their mother's caregiver; however, caregivers cannot claim for more than six children who are not their biologically or legally adopted child. There is also evidence that the presence of a child's biological mother increases the probability of having CSG receipt, and that, compared to children who live with both parents or just their biological father, children who resided with their biological mother were more likely to have CSG receipt (Hochfeld, 2022). These first three sections have established the critical context for understanding CSG access among adolescent and young mothers in South Africa. Section 2.1 introduced the key research questions and hypotheses regarding barriers to CSG take-up and timing of access. Section 2.2 provided a comprehensive examination of the socioeconomic landscape in South Africa, particularly focusing on how structural inequalities and gender dynamics create unique challenges for young mothers. This background highlighted multiple dimensions of disadvantage including educational barriers, unemployment, care responsibilities, gender discrimination and violence. Section 2.3 then detailed South Africa's social assistance system and the specific features of the CSG, examining both its successes in reaching vulnerable populations and persistent gaps in coverage, particularly for children of adolescent

mothers. Having established this theoretical and contextual foundation, we now turn to the empirical analysis. The following section will detail the methodological approach used to examine CSG access among adolescent mother-child dyads, including data collection procedures, variable selection, and analytical strategies employed to test the hypothesized relationships between maternal age, CSG receipt, and timing of access.

2.4 Data and Methodology

This analysis draws from the first wave[1] of the HEY BABY (Helping Empower Youth Brought Up in Adversity with Their Babies and Young Children) study, a prospective cohort study conducted between 2017 and 2019 in the Eastern Cape province of South Africa. The study aims to assess resilience-promoting pathways for adolescent parent families living in adversity, including young parents living in resource-constrained, HIV-affected communities. The main areas covered in the study are sexual and reproductive health, food and nutrition, education, social support networks, social services and child development. The participants in this project are an especially vulnerable group. The Eastern Cape province is also one of the poorest provinces in South Africa (SASSA, 2020), with high HIV prevalence(Johnson et al., 2022), and adolescent pregnancy rates (Barron et al., 2022).

Research Setting and Sample

Adolescent and young mother-child dyads (N = 1,044 mothers, 1,137 children) located in urban, peri-urban, and rural areas of two health districts, Buffalo City Municipality and Amathole Health District, in the Eastern Cape province of South Africa were recruited for this study. Participants were recruited at 73 district public health facilities, 43 secondary schools, and 9 maternity obstetric units. Additional sampling strategies included recruitment from service provider referrals, referrals from adolescent mothers, and door-to-door recruitment within the community. Through consultations with the Teen Advisory Group, this sampling strategy was designed to ensure that hard-to-reach adolescents were included in the study and that recruitment bias was minimized. Eligibility in this study was restricted to girls and young women residents in the Buffalo City Municipality or Amathole Health District who were between the ages of 10 and 24 years at the time of the study, most of whom had a child before 20 years. Rates of successful recruitments and refusals for each channel were recorded, with successful enrollment rates for each channel between 95% and 98% for all mothers identified as eligible.

[1] Only the first wave of data had collected information on CSG receipt for children. The two follow-up phases were focused on the mother and the second wave which focuses again on the children had not yet been collected at the time of writing this thesis.

Data Collection Procedure

Voluntary and informed consent was sought from young mothers who were above the age of 18, and assent was provided by younger participants in addition to consent from their adult caregiver. Additional consent was obtained from the child's primary caregiver if the young mother indicated that they were not the main caregiver for their child. All consent forms and questionnaires were available in English and isiXhosa and were read aloud to participants who requested them. Ethical approval for the study was granted by the Universities of Oxford (R48876/RE002) and Cape Town (HREC 226/2017). Permission to conduct the study was also provided by the Eastern Cape Provincial Departments of Health and Basic Education.

Participants completed two surveys in a location and language (English or IsiXhosa) of their choosing. Interviews were completed on electronic tablets using audio-assisted mobile self-interviewing with the assistance of trained local interviewers. Child development assessments were conducted and scored by trained researchers, and the length of assessments depended on the child's age and skill level (approximately 15–60 minutes). Throughout the study, the confidentiality of participants was upheld, except in cases where participants required referrals and gave consent for their details to be shared (n=25). Other referrals included food referrals and grant access referrals. All participants were given a pack composed of useful items such as diapers and soap and awarded a certificate of completion. Refreshments were also provided during the surveys and development assessments.

Variable Description, Selection and Hypotheses

The selection of potential determinants for CSG take-up that may help to identify trends and correlates of grant exclusion for children born to young mothers was grounded in a comprehensive review of existing literature (DSD, SASSA & UNICEF, 2016).Table 1 describes the variables selected for analysis and the expected signs of associations between the independent variables and the dependent variable of early CSG receipt. These child-level, mother-level and household-level factors allow for the socio-economic and demographic profiling of children deemed eligible for, but not receiving, the CSG. They also assist in the determination of the reasons for non-receipt and delays in CSG take-up by those who are eligible in terms of the legislation.

Table 1: Variable descriptions and expected signs

Name of Variable	Description of the Variable	
Dependent Variables		
CSG Receipt	a binary variable (1 = CSG receipt; 0 = no CSG receipt) created based on if adolescent and young mothers reported that the child has been receiving the CSG for a week or more when asked "How old was your child when you started getting the child support grant?"	
Early CSG Receipt	A binary variable indicating 1 if child's age when they started receiving the CSG was two months or younger, and 0 indicated delayed CSG receipt and indicated children who were older than 2 months when they received the CSG. This was based on adolescent and young mother participants self-report on the age (in years, months, and weeks) of each of their children if they received the CSG.	
Exclusion Criterion		
Child born to mother aged 16 or older	Measured in months at the time of the mother's interview date and using a continuous variable. This age corresponds to when CSG receipt was measured.	
Child is aged under 1 year	Measured in years at the time of the mother's interview date and using a binary variable indicating 1 if the child was aged under a year and 0 if the child was aged 1 year or older.	
Mothers age	Measured in years at the time of the mother's interview	
Explanatory Variables		Expected Sign
Child Factors		
Female	Measured using a binary variable indicating 1 if the child is female and 0 if the child is male	Positive
Has siblings	Measured using a binary variable coded 1 if the child has siblings and 0 if the child has no siblings	Positive
Has caregiver support	A binary item was derived to determine if receiving some childcare support from the mother's caregiver may facilitate a child's receipt of the CSG. Based on an adolescent and young mother self-report item which asks, "does anyone help you look after your child at home (without you) at least once every 2 weeks?", this variable was coded 1 if the child received some childcare support from the mother's caregiver and 0 if the mother's caregiver was not selected.	Positive

Born to mother aged 16 or older	Measured using a binary variable indicating 1 if young mothers were 16 years or older when the child was born and 0 if the mother was under 16 years of age at the time of the child's birth.	Negative
Adolescent Mother Factors		
Mothers' education is only up to grade 9	A binary variable measured by asking participants "What is the highest grade you have passed?" and coded as 1 if the response was school grade 9 or less, and 0 if their highest school grade attained was grade 10 and above. This approach addresses the non-normal distribution of the highest level of education variable and ensures roughly equal group sizes for robust statistical comparisons while maintaining substantive relevance.	Negative
Mother is experiencing poor mental health symptoms	The overall mental health of mothers is measured using a composite variable of mental health, with 1 coded as the participant being above the cut-off for anxiety, depression, PTSD or suicidality/ self-harm symptomatology. The short form of the 10-item Child Depression Inventory (CDI-S) was used to measure depression symptomology. A binary variable was used with scores of 3 or greater indicating depression symptomatology (Allgaier et al., 2003). Within South Africa, the CDI-S has been used, shows good validity and strong psychometric qualities (Steven-Roberts et al., 2022). To measure Anxiety symptomology, the Children's Manifest Anxiety Scale – Revised (RCMAS) was used and consists of 14 items with scores between 0 and 14 (Gerard & Reynolds, 1999). A binary variable was used with scores of 10 or greater indicating Anxiety symptomatology (Gerard & Reynolds, 1999). Amongst children and adolescents affected by HIV, the RCMAS shows good validity and internal consistency (Boyes & Cluver, 2013). The Mini International Neuropsychiatric Interview (MINI-Kid) was used to assess suicidality and self-harm symptomology and consists of 5 items with scores ranging from 0 to 5 (Sheehan et al., 2010). A binary variable was used with participants who received any score above 1 indicated as experiencing suicidal symptoms (Sheehan et al., 2010). The MINI-Kids has been validated globally and has shown test-retest reliability and good internal consistency (Sheehan et al., 2010). All participants who reported suicidal symptoms were referred at the interview point to the appropriate services. The Child PTSD checklist measured PTSD using the 12-item version, representing four domains, including avoidance, re-experience, hyperarousal and, dysphoria (Amaya-Jackson et al., 1995). A binary variable was used with participants scoring one or more on one or more items in each	Negative

	of the domains indicating a partial screen for PTSD. Widely used amongst adolescent and youth in South Africa (Seedat et al., 2004; Seedat et al., 2000), the Child PTSD Checklist is validated in South Africa (Boyes et al., 2012).	
Household Factors		
House is an informal dwelling	measured by asking participants "Please tell us what type of house you live in now" and coding a binary variable 1 if they reported living in a "shack in a back yard or separate plot" or "living on the street" and 0 if they reported living in a "house made of brick or concrete" or "hut made of traditional materials (co dung, mud, etc.) OR a rondavel on its own plot" or "children's home OR shelter for kids"	Negative
House is in a rural residence	Measured using a binary variable coded as 1 if the participants address was located in a rural area and 0 if they resided in an urban area.	Negative
Food insecurity at home	measured by asking participants "How many days in the past week (7 days) did you not have enough food in your home?" and coding a binary variable 1 if participants reported going at least two days in the past week without enough food and 0 if they reported going less than two days without food.	Negative
Conflict or violence at home	Measure for National-level Monitoring of Orphans and other Vulnerable Children designed by UNICEF were used to capture conflict or violence at home (Snider and Dawes 2006). A binary variable based on two items "How many days in the last week were there arguments with adults shouting in your home?" and "How many days in the last week were there arguments with adults hitting each other in your home?" was coded 1 if participants experienced any arguments with adults shouting or hitting each other in the home in the past week and 0 if they did not experience any arguments in the past week.	Negative

- Child Level Factors

In certain contexts, parents may have preferences for specific genders, and this could influence the resources and time allocated towards a child (Attanasio, Cattan & Meghir, 2022). Having siblings may suggest prior experience with grant applications, as caregivers who have previously applied for CSG for older children might find subsequent applications easier to complete. While age restrictions prevent mothers under 16 from applying directly, this eligibility requirement can be overcome by accessing the grant through the mother's caregiver. Moreover, caregiver support likely facilitates earlier application by assisting with documentation and application processes.

- Mother Level Factors

The adverse effects of low levels of education are observable through a women's life. Girls who have low levels of education are less able to make their own decisions around family planning, they face more health problems and psychological distress, and their children are at heightened risk of malnutrition and illiteracy. It is education that is foundational to both skills and aspirations, with educated women more able to manage property and their finances and to access credit, social networks and services (WHO, 2019).Alternatively, poor mental health symptoms could reduce a mother's capacity to complete applications promptly and diminish her engagement with social networks or support systems that might assist in the process.

- Household Level Factors

The targeting of CSG at disadvantaged populations suggests these factors would positively correlate with grant receipt, as higher need should drive higher uptake. Despite the intention to prioritize the most disadvantaged groups, the estimated coverage of the CSG is relatively lower for children in families facing extreme poverty (Dulvy et al., 2023). While disadvantage may increase likelihood of eligibility and grant receipt, factors like informal housing, rural residence, food insecurity, and household conflict likely delay access due to administrative barriers and resource constraints.

Data and Data Analysis

Within the baseline sample of the HEYBABY study there are 1044 mothers and 1141 children. From this sample, 62 children were dropped from the analysis because their mother was 20 years or older at the time of the child's birth. 77 participants were excluded because they received the CSG, but not through the mother or the mother's caregiver. A further 31 children were excluded because these mother-child dyads had missing values for child receives some caregiver support (n = 7), mother highest school grade is 9 or less (n = 1), home is an in informal dwelling (n = 23), household is food insecure (n = 7). The total included sample consisted of 971 children and 920 adolescent and young mothers (N = 170 excluded). Further analysis was conducted with a subsample of only CSG recipients who has access to the CSG through their adolescent mother or

their mother's caregiver (n = 251 non-recipients excluded). The final analysis of this sample was based on 720 children of 686 adolescent mothers (N = 421 excluded).

Stata 17.0 was used to analyses this data. Initial data preparation involved assessing frequencies and distributions of variables to determine relevant covariates. ***Preliminary analysis*** explored differences in covariates across key comparison groups: CSG receipt versus exclusion, mother versus caregiver CSG recipients, and early versus delayed CSG receipt. ***Graphical analysis*** used kernel density plots to explore the distribution of child's age at CSG initiation, as well as mothers' age at child's birth by CSG receipt. Based on model diagnostics and estimation challenges (see Appendix A), ***Final Estimation Results*** employed a Heckman selection model to address the evident selection bias. The attempted maximum likelihood estimation of the Heckman model encountered non-convergence issues, further supporting the presence of complex selection patterns. Consequently, the more robust two-step estimation approach was adopted. Three Heckman selection models explored factors associated with CSG receipt and early CSG receipt when comparing non-recipients with (1) the full sample of adolescent and caregiver CSG recipients (2) adolescent mother CSG recipients, and (3) caregiver CSG recipients.

Method: Heckman Selection Model

Probit estimation of early CSG initiation is based on strong assumptions that children with CSG receipt and those with no CSG receipt are comparable groups and CSG receipt occurs randomly. However, because characteristics that are not randomly distributed amongst individuals could be driving individuals' decisions to apply for CSG, this assumption may not hold. As an example, children with CSG receipt can have observable and unobservable characteristics, such as better knowledge of social grant systems, access to necessary documents (like birth certificates and IDs), higher motivation to seek social support, and better understanding of application procedures which enhance the likelihood of CSG receipt. If there are characteristics that affect CSG receipt probability which are also correlated with early CSG receipt, this would create bias and inconsistencies in the explanatory variables' parameters. To correct for this bias, a Heckman two-stage selection model can be used (Heckman, 1979).

Our analysis employs a Heckman selection model to examine factors influencing both CSG receipt and early CSG receipt. The model accounts for potential selection bias and is applied in two stages. To first capture what explains CSG receipt, a selection equation is estimated. In the Heckman models, estimates that are provided for the parameters are both consistent and asymptotically

efficient. The first stage estimates the probability that a child has a CSG receipt using a Probit model.

To identify a Heckman model, the first stage equation needs to have at least one covariate that is not in the second stage equation. In other words, the covariate should be correlated with the probability of having a CSG receipt but should be uncorrelated with early CSG receipt. Children and mothers age at interview date can also serve this purpose. These variables can logically influence whether a child receives the CSG (selection equation), but the child's age at CSG initiation is a historical event that happened in the past and cannot be affected by current age.

To estimate the probability that a child does have a CSG receipt, a probit model is used. The dependent variable is a dummy that equals one for children with a CSG receipt and zero otherwise. The model with the dependent variable and regressors for the underlying regression model is specified below:

$$d = \beta 0 + \beta 1 female + \beta 2 siblings + \beta 3 mother16atchildbirth + \beta 4 caregiversupport + \beta 5 grade9orless + \beta 6 informalhousing + \beta 7 rural + \beta 8 foodinsecure + \beta 9 domesticconflict + \beta 10 childagedunder1 + \beta 11 mothersage + \varepsilon_i \quad (1)$$

Where $d = \begin{cases} 1 \; if \; y > 0 \\ 0 \; if \; y \leq 0 \end{cases}$ denotes the likelihood that there is a CSG receipt for the child, β represents the coefficients of the independent variables, and ε is the error term. In general, Children born to adolescent mothers who are 16 years or older at the time of birth are more likely to receive the CSG because the mother herself becomes eligible to apply for the grant directly. This direct eligibility reduces reliance on external caregivers to apply on behalf of the child. Children under 1 year at interview may be less likely to receive CSG receipt due to administrative barriers in obtaining necessary documentation like birth certificates in the early months of life. Similarly, mother's age at interview is expected to affect CSG receipt because older mothers may have better knowledge of available social support and more capacity to navigate bureaucratic processes.

The Inverse Mills Ratios (IMR) are obtained after estimating equation (1) and subsequently incorporated into equation (2) as an independent variable. A statistically significant coefficient for the Inverse Mills Ratio in equation (2) suggests the presence of selection bias. The second-stage probit equation, which includes the selection term (IMR), is represented by the following equation:

$$earlyCSG = \beta 0 + \beta 1female + \beta 2siblings + \beta 3mother16atchildbirth + \beta 4caregiversupport + \beta 5grade9orless + \beta 6informalhousing + \beta 7rural + \beta 8foodinsecure + \beta 9domesticconflict + \beta 10poormentalhealth + \rho IMRi + \varepsilon_{2i} \quad (2)$$

The first-stage equation includes a greater number of covariates compared to the second-stage equation, ensuring the identification of the two-stage Heckman model. The identifying variables are: Whether the child is under 1 year old and the mother's age at the time of the interview. If ρ is statistically significant, then the probit will give inconsistent estimates. If ρ is statistically insignificant then the probit estimates will be unbiased.

2.5 Estimation Results

Preliminary Analysis of Group Differences

- Bivariate Comparisons of Child's CSG Receipt Status (Table 2).

Our sample includes 971 children, of whom 720 (74.2%) receive the Child Support Grant. Child-level characteristics show that 49.2% of children are female, with identical proportions among those with and without CSG receipt (49.2% vs 49.4%). A significantly lower proportion of children with CSG receipt are under 1 year of age compared to those without (36.3% vs 58.6%). Children with CSG receipt are more likely to have siblings (34.3% vs 25.1%) and possess birth certificates (97.6% vs 78.5%). Most children live with their adolescent mothers (95.6%), with marginally higher rates among those with CSG receipt (96.3% vs 93.6%, p = 0.08). The number of children receiving caregiver support and born when the adolescent mother was 16 or older are similar between groups.

Among the 920 adolescent mothers in our sample, those whose children have CSG receipt are significantly older at interview (18.5 vs 17.8 years) and less likely to have only up to grade 9 or lower as their highest education level (38.9% vs 51.3%). Most mothers live with their caregivers (91.8%), with similar rates between those with and without CSG receipt (92.1% vs 91.1%). There are more adolescents without maternal biological caregivers whose children do not have CSG receipt, compare to those who do (35.1% vs 45.8%). About a quarter of mothers live in informal dwellings (22.2%) or rural areas (28.8%), with no significant differences by CSG status. Mothers of children with CSG receipt report higher rates of domestic conflict or violence (8.6% vs 4.7%), though rates of food insecurity and poor mental health symptoms are similar between groups.

Table 2: Bivariate Comparison of Child and Mother-Level Factors by the Child's CSG Receipt Status

	Total		CSG Receipt		No CSG Receipt		p-val	N
Child is female	478	49.2%	354	49.2%	124	49.4%	0.949	971
Child aged under 1 year	408	42.0%	261	36.3%	147	58.6%	0.000***	971
Child has siblings	310	31.9%	247	34.3%	63	25.1%	0.007***	971
Child has a birth certificate	900	92.7%	703	97.6%	197	78.5%	0.000***	971
Child was born when mother was aged 16 or older	755	77.8%	559	77.6%	196	78.1%	0.883	971
Child receives some caregiver support	700	72.1%	520	72.2%	180	71.7%	0.877	971
Child is living with their mother	928	95.6%	693	96.3%	235	93.6%	0.082*	971
Mother is living with their caregiver	845	91.8%	630	92.1%	215	91.1%	0.627	920
Mothers' caregiver is not their biological mother	348	37.8%	240	35.1%	108	45.8%	0.004***	920
Mothers age	18.28	(1.76)	18.47	(1.76)	17.75	(1.65)	0.000***	920
Mothers highest school grade is 9 or less	387	42.1%	266	38.9%	121	51.3%	0.001***	920
Mother is experiencing poor mental health symptoms	150	16.3%	106	15.5%	44	18.6%	0.259	920
Mother is living in an informal dwelling	204	22.2%	158	23.1%	46	19.5%	0.250	920
Mother is living in a rural area	265	28.8%	204	29.8%	61	25.8%	0.245	920
Mother is food insecurity	210	22.8%	158	23.1%	52	22.0%	0.737	920
Mother is experiencing conflict or violence at home	70	7.6%	59	8.6%	11	4.7%	0.048**	920

Note. This table compares child-level and mother-level factors between children who receive the Child Support Grant (CSG) and those who do not. For child-level variables, data are based on the total number of children (N = 971), while for mother-level variables, one observation per mother was retained (N = 920), and results were summarized for this sample. Binary variables report the number (n) and percentage (%) of participants with a score of 1, and the continuous variable (mothers age at interview date) presents the mean and standard deviation (in brackets). Statistical significance was assessed using t-tests for continuous variables and Chi-squared tests for binary variables, with significance denoted by ***p < 0.01, **p < 0.05, and *p < 0.10. 720 children had a CSG receipt and 251 had no CSG receipt.

- Bivariate Comparisons of Adolescent vs Caregiver CSG Recipient Status (Table 3).

Among the 720 children with CSG receipt in our sample, 438 (60.8%) have adolescents as CSG recipients, and 282 (39.2%) have caregivers as CSG recipients. Child-level factors show that children of adolescent CSG recipients are less likely to be female (34.9% vs 71.3%) and to have siblings (23.7% vs 50.7%). The proportion of children under 1 year shows no significant difference between groups (35.2% vs 37.9%). Additionally, children of adolescent CSG recipients are less likely to have a birth certificate (68.3% vs 143.3%) and are less likely to have been born when their mother was aged 16 or older (52.7% vs 116.3%). They are also less likely to receive some caregiver support (55.0% vs 98.9%) and less likely to be living with their mother (68.3% vs 139.7%).

Among the 686 adolescent mothers, adolescent CSG recipients (compared to caregiver CSG recipients) have significantly older mothers at the time of the interview (19.0 vs 17.65 years) and are less likely to live with the caregiver (89.5% vs 96.0%). The caregiver is also less likely to be their biological mother (39.7% vs 28.1%). They live in households that report higher rates of food insecurity (25.7% vs 19.1%). There are no significant differences in education level (36.5% vs 42.4% with grade 9 or lower), residence in informal dwellings (23.5% vs 22.3%), or rural areas (31.6% vs 27.0%). Additionally, there are no significant differences in the experience of conflict or violence (8.8% vs 8.6%) or poor mental health symptoms (16.2% vs 14.7%).

Table 3: Bivariate Comparison of Child and Mother-Level Factors by Adolescent vs Caregiver CSG Recipient Status.

	Total		Adolescent		Caregiver		p-val	N
Child is female	354	49.2%	153	43.22%	201	56.78%	0.053*	720
Child aged under 1 year	261	36.3%	154	59.00%	107	41.00%	0.163	720
Child has siblings	247	34.3%	104	42.11%	143	57.89%	0.000***	720
Child has a birth certificate	703	97.6%	299	42.53%	404	57.47%	0.019**	720
Child was born when mother was aged 16 or older	559	77.6%	231	41.32%	328	58.68%	0.000***	720
Child receives some caregiver support	520	72.2%	241	46.35%	279	53.65%	0.000***	720
Child is living with their mother	693	96.3%	299	43.15%	394	56.85%	0.001***	720
Mother is living with their caregiver	632	92.1%	365	57.75%	267	42.25%	0.002***	686
Mothers' caregiver is not their biological mother	240	35.0%	162	67.50%	78	32.50%	0.002***	686
Mothers age	18.47	(1.76)	19	-1.57	17.65	-1.73	0.000***	920
Mothers highest school grade is 9 or less	267	38.9%	149	55.81%	118	44.19%	0.118	686
Mother is experiencing poor mental health symptoms	107	15.6%	66	61.68%	41	38.32%	0.613	686
Mother is living in an informal dwelling	158	23.0%	96	60.76%	62	39.24%	0.708	686
Mother is living in a rural area	204	29.7%	129	63.24%	75	36.76%	0.192	686
Mother is food insecurity	158	23.0%	105	66.46%	53	33.54%	0.042**	686
Mother is experiencing conflict or violence at home	60	8.7%	36	60.00%	24	40.00%	0.931	686

Note. This table compares child-level and mother-level factors between children who receive the Child Support Grant (CSG) through their mother and those who receive the CSG through their mother's caregiver. For child-level variables, data are based on the total number of children (N = 720), while for mother-level variables, one observation per mother was retained (N = 686), and results were summarized for this sample. Binary variables report the number (n) and percentage (%) of participants with a score of 1, and the continuous variable (mothers age at interview date) presents the mean and standard deviation (in brackets). Statistical significance was assessed using t-tests for continuous variables and Chi-squared tests for binary variables, with significance denoted by ***$p < 0.01$, **$p < 0.05$, and *$p < 0.10$. 438 children had adolescent CSG recipients, and 282 children had caregiver CSG recipients.

- Bivariate Comparisons of Early vs Delayed CSG Receipt (Table 4)

Among the 720 children with CSG receipt in our sample, 308 (42.8%) initiated the grant within 2 months (early CSG receipt) and 412 (57.2%) after 2 months (delayed CSG receipt). Child-level factors show that children with early CSG receipt are significantly more likely to be younger (under 1 year of age) at interview (50.0% vs 26.0%) and to receive caregiver support (78.2% vs 67.7%). Other child characteristics show no significant differences between early and delayed receipt groups, including the child being female (49.7% vs 48.8%), having siblings (33.8% vs 34.7%), having a birth certificate (97.1% vs 98.1%), being born to mothers aged 16 or older (75.0% vs 79.6%), and living with their mother (97.1% vs 95.6%).

Among the 686 adolescent mothers, those whose children have early CSG receipt are significantly younger at interview (18.1 vs 18.6 years), compared to those with delayed CSG receipt. However, most other maternal characteristics show no significant differences between early and delayed receipt groups, including education level (37.8% vs 39.7% with grade 9 or lower), living with caregivers (93.4% vs 91.2%), residence in informal dwellings (24.0% vs 22.4%) or rural areas (30.2% vs 29.4%), food insecurity (24.7% vs 21.9%), experience of conflict or violence (7.3% vs 9.8%), and poor mental health symptoms (15.6% vs 15.6%).

Table 4: Bivariate Comparison of Child and Mother-Level Factors by Early CSG Receipt.

	Total		Early CSG		Delayed CSG		p-val	N
Child is female	354	49.2%	153	49.7%	201	48.8%	0.813	720
Child aged under 1 year	261	36.3%	154	50.0%	107	26.0%	0.000***	720
Child has siblings	247	34.3%	104	33.8%	143	34.7%	0.792	720
Child has a birth certificate	703	97.6%	299	97.1%	404	98.1%	0.391	720
Child was born when mother was aged 16 or older	559	77.6%	231	75.0%	328	79.6%	0.142	720
Child receives some caregiver support	520	72.2%	241	78.2%	279	67.7%	0.002***	720
Child is living with their mother	693	96.3%	299	97.1%	394	95.6%	0.312	720
Mother is living with their caregiver	632	92.1%	269	93.4%	363	91.2%	0.292	686
Mothers' caregiver is not their biological mother	240	35.0%	84	29.2%	156	39.2%	0.007***	686
Mothers age	18.47	(1.76)	18.21	(1.82)	18.67	(1.69)	0.017**	686
Mothers highest school grade is 9 or less	267	38.9%	109	37.8%	158	39.7%	0.624	686
Mother is experiencing poor mental health symptoms	107	15.6%	45	15.6%	62	15.6%	0.987	686
Mother is living in an informal dwelling	158	23.0%	69	24.0%	89	22.4%	0.624	686
Mother is living in a rural area	204	29.7%	87	30.2%	117	29.4%	0.819	686
Mother is food insecurity	158	23.0%	71	24.7%	87	21.9%	0.391	686
Mother is experiencing conflict or violence at home	60	8.7%	21	7.3%	39	9.8%	0.251	686

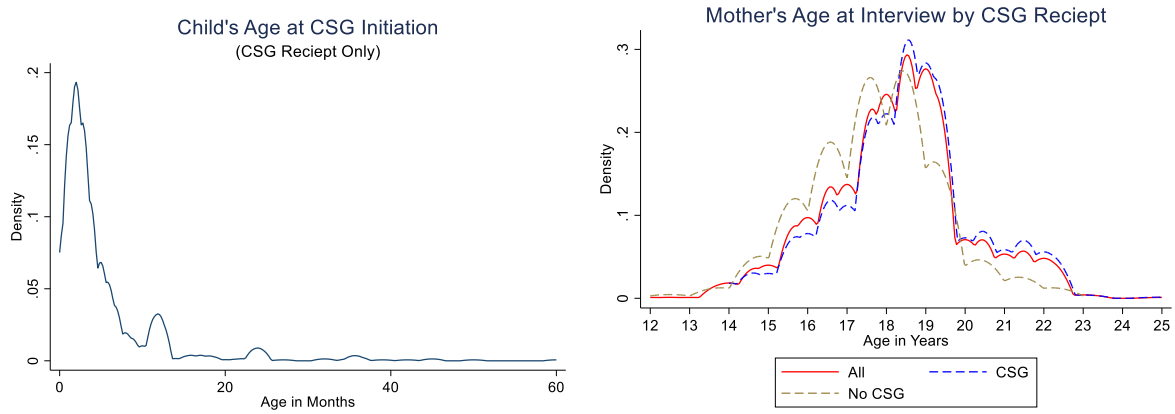
Note. This table compares child-level and mother-level factors between children who receive the Child Support Grant (CSG) early (within the first 2 months of life) and those who faced delayed CSG receipt (after 2 months). For child-level variables, data are based on the total number of children (N = 720), while for mother-level variables, one observation per mother was retained (N = 686), and results were summarized for this sample. Binary variables report the number (n) and percentage (%) of participants with a score of 1, and the continuous variable (child's age) presents the mean and standard deviation (SD). Statistical significance was assessed using t-tests for continuous variables and Chi-squared tests for binary variables, with significance denoted by ***$p < 0.01$, **$p < 0.05$, and *$p < 0.10$. 308 children had initiated the CSG within 2 months and were classified as having early CSG receipt. 412 children initiated the CSG only after 2 months and 308 were classified as experiencing delayed CSG receipt.

Graphical Analysis of Age Distributions

To address the non-normal, right-skewed distribution of age at CSG initiation, we created a binary variable using the median split at 2 months, dividing children into early (≤2 months) versus delayed (>2 months) initiation groups. This approach ensured roughly equal group sizes for robust statistical comparisons while maintaining substantive relevance given the importance of early infancy support.

Figure 1 presents the distributions of child's age at CSG initiation and maternal age at childbirth. The left panel shows that CSG initiation is heavily concentrated in the first two months after birth, followed by a sharp decline and a right-skewed distribution for later initiations. The right panel reveals differential patterns of CSG receipt by maternal age at childbirth. Children born to mothers under 18 years show higher rates of CSG non-receipt compared to receipt, while those born to mothers aged older than 18 years show higher rates of CSG receipt, suggesting barriers to CSG receipt for children of adolescent mothers, compared to older mothers in the HEYBABY cohort. To address the non-normal, right-skewed distribution of age at CSG initiation, we created a binary variable using the median split at 2 months, dividing children into early (≤2 months) versus delayed (>2 months) initiation groups. This approach ensured roughly equal group sizes for robust statistical comparisons while maintaining substantive relevance given the importance of early infancy support.

Figure 1: Age Distributions



Final Estimation Results for Two-Stage Heckman Model

A two-stage Heckman Selection model is applied as discussed below. The marginal effects of the first stage Probit regression model are presented in Table 5 (also see Table 1A in Appendix A which describes the model building process). Model 1 includes the full sample of CSG recipients,

Model 2 focuses on adolescent mother CSG recipients, and Model 3 examines caregiver CSG recipients. Across all models, the presence of selection bias was confirmed by the significant and positive Mills ratio (λ).

- CSG Receipt (Table 5)

The results suggest that when adolescent mothers have low education levels (grade 9 or less), the probability of their children receiving CSG decreases by 9.3 percentage points ($p < 0.01$) in Model 1 (all CSG recipients), 9.3 percentage points ($p < 0.01$) in Model 2 (adolescent CSG recipients), and 15.5 percentage points ($p < 0.01$) in Model 3 (caregiver CSG recipients), ceteris paribus, compared to those with higher education than grade 9. Additionally, compared to young mothers, children born to adolescent mothers who are 16 years or older have a lower probability of CSG receipt, with a decrease of 9.3 percentage points ($p < 0.05$) in Model 1 and 11.3 percentage points ($p < 0.1$) in Model 3. This result suggests that this transition into eligibility may be a barrier which particularly effects caregiver CSG recipients.

The exclusion restrictions in the selection model are significant. Children aged under 1 year have a reduced probability of selecting into CSG receipt, with a decrease of 11.2 percentage points ($p < 0.01$) in Model 1, 9.6 percentage points ($p < 0.05$) in Model 2, and 23.1 percentage points ($p < 0.01$) in Model 3. Older maternal age decreased the probability of selecting into CSG receipt through caregiver CSG recipients, with a marginal effect of -3.3 percentage points ($p < 0.1$) in Model 3. However, for adolescent CSG recipients, children have an increased probability of selecting into CSG as mothers age, with a marginal effect of 3.4 percentage points ($p < 0.01$) in Model 1 and 8.1 percentage points ($p < 0.01$) in Model 2. Children who receive some caregiver supports are significantly more likely to have CSG receipt through caregiver recipients (Model 3), with a 14.7 percentage point increase in probability ($p < 0.01$).

Mothers experiencing any domestic violence or domestic arguments have an increased probability of selecting into CSG receipt, with marginal effects of 13.0 percentage points ($p < 0.05$) in Model 1, 13.4 percentage points ($p < 0.05$) in Model 2, and 17.9 percentage points ($p < 0.05$) in Model 3. Rural residence also increases the probability of selection into CSG receipt through adolescent CSG recipients, with a marginal effect of 7.1 percentage points ($p < 0.1$) in Model 2.

The Inverse Mills Ratio, derived from the selection equation Probit model coefficients (provided in Appendix A), was included in the second-stage regression model to correct for selection bias. The results are presented in Table 5.

Table 5: CSG Receipt Probit Regression Model for Adolescent and Caregiver CSG Recipients

	(1) Model 1	(2) Model 2	(3) Model 3
Child is female	-0.018	-0.005	-0.055
	(0.027)	(0.034)	(0.041)
Child has siblings	0.037	0.059	-0.007
	(0.031)	(0.038)	(0.049)
Child was born when mother was aged 16 or older	-0.093**	-0.062	-0.113*
	(0.041)	(0.054)	(0.058)
Child receives some caregiver support	0.027	-0.017	0.147***
	(0.031)	(0.037)	(0.048)
Mothers highest school grade is 9 or less	-0.093***	-0.093***	-0.155***
	(0.029)	(0.036)	(0.044)
Home is an informal dwelling	0.048	0.035	0.082
	(0.033)	(0.041)	(0.051)
Home is in a rural area	0.047	0.071*	0.042
	(0.031)	(0.039)	(0.048)
Household is food insecurity	-0.028	-0.015	-0.058
	(0.033)	(0.041)	(0.051)
Any domestic violence or domestic arguments	0.130**	0.134**	0.179**
	(0.055)	(0.068)	(0.083)
Child aged under 1 year	-0.112***	-0.096**	-0.231***
	(0.031)	(0.038)	(0.047)
Mothers age	0.034***	0.081***	-0.033*
	(0.011)	(0.013)	(0.017)
Observations	971	689	533
Chi-squared	75.85	118.2	59.87
Pseudo R-squared	0.0683	0.131	0.0812

Note. This table presents the marginal effects from probit regression models examining factors associated with CSG receipt. Standard errors are shown in parentheses below the marginal effects. Binary variables show the change in probability of CSG receipt when moving from 0 to 1. Maternal age shows the change in probability for each additional year. Statistical significance is denoted by *** p<0.01, ** p<0.05, * p<0.1. Model 1 includes all adolescent and caregiver recipients, model 2 includes only adolescent CSG recipients, and model 3 includes only caregiver CSG recipients.

- Early CSG Receipt (Table 6)

Having siblings significantly increases the probability of early CSG receipt in Model 1 (all recipients) and Model 2 (adolescent recipients), with marginal effects of 10.1 percentage points ($p < 0.05$) and 11.2 percentage points ($p < 0.05$), respectively. However, this effect is not significant for caregiver recipients (Model 3), where the marginal effect is -0.023 ($p > 0.1$). Children with siblings are more likely to receive CSG early, particularly in cases where the recipient is an adolescent mother. Caregiver support significantly increases the probability of early CSG receipt across all models. The marginal effects are 16.2 percentage points ($p < 0.01$) in Model 1, 15.6 percentage points ($p < 0.01$) in Model 2, and 20.3 percentage points ($p < 0.05$) in Model 3. Low education levels (grade 9 or less) significantly decrease the probability of early CSG receipt in Model 1 and Model 2, with marginal effects of -17.2 percentage points ($p < 0.01$) and -13.9 percentage points ($p < 0.01$), respectively. The effect is not significant in Model 3, with a marginal effect of -0.098 ($p > 0.1$). Children born to adolescent mothers aged 16 or older have a significantly lower probability of early CSG receipt in Model 1 and Model 3, with marginal effects of -12.9 percentage points ($p < 0.01$) and -28.5 percentage points ($p < 0.01$), respectively. However, this effect is not significant in Model 2, where the marginal effect is 0.070 ($p > 0.1$). Living in an informal dwelling significantly increases the probability of early CSG receipt in Model 1 and Model 3, with marginal effects of 11.5 percentage points ($p < 0.01$) and 21.8 percentage points ($p < 0.01$), respectively. However, this effect is not significant in Model 2, where the marginal effect is 0.036 ($p > 0.1$). The Inverse Mills Ratio is significant across all models. This indicates that selection bias was present and has been corrected for in the analysis.

Table 6: Early CSG Receipt Probit Regression Model for Adolescent and Caregiver CSG Recipients

	(1) Model 1	(2) Model 2	(3) Model 3
Child is female	0.003	0.026	-0.036
	(0.036)	(0.046)	(0.058)
Child has siblings	0.101**	0.112**	-0.023
	(0.041)	(0.052)	(0.067)
Child was born when mother was aged 16 or older	-0.129***	0.070	-0.285***
	(0.045)	(0.067)	(0.084)
Child receives some caregiver support	0.162***	0.156***	0.203**
	(0.041)	(0.050)	(0.088)
Mothers highest school grade is 9 or less	-0.172***	-0.139***	-0.098
	(0.045)	(0.054)	(0.082)
Home is an informal dwelling	0.115***	0.036	0.218***
	(0.044)	(0.056)	(0.073)
Home is in a rural area	0.029	-0.008	0.008
	(0.041)	(0.052)	(0.067)
Household is food insecurity	0.043	0.050	0.038
	(0.043)	(0.054)	(0.075)
Any domestic violence or domestic arguments	0.074	0.037	-0.054
	(0.067)	(0.082)	(0.118)
Mother is experiencing poor mental health symptoms	0.059	0.054	-0.005
	(0.052)	(0.065)	(0.091)
Inverse Mills ratio	0.793***	0.299***	0.479***
	(0.126)	(0.106)	(0.183)
Observations	720	438	282
Chi-squared	51.81	22.47	22.08
Pseudo R-squared	0.0527	0.0381	0.0566

This table presents the marginal effects from probit regression models examining factors associated with early CSG receipt. Standard errors are shown in parentheses below the marginal effects. Binary variables show the change in probability of CSG receipt when moving from 0 to 1. Maternal age shows the change in probability for each additional year. Statistical significance is denoted by *** p<0.01, ** p<0.05, * p<0.1. Model 1 includes all adolescent and caregiver recipients, model 2 includes only adolescent CSG recipients, and model 3 includes only caregiver CSG recipients.

2.6 Discussion

This chapter aimed to investigate the barriers, facilitators, and delays in CSG access for children of adolescent mothers. The findings largely support the initial hypothesis that adolescent mothers face distinct barriers contributing to delays in CSG access. Knowledge and knowledge gaps in particular appear to be playing a role. For instance, lower maternal education (9 years or less) is negatively associated with CSG receipt and early CSG receipt, with delays in CSG receipt particularly effecting adolescent CSG recipients with low education levels. This suggests that less educated mothers face greater barriers to accessing the CSG potentially due to limited knowledge about application procedures, weaker support networks to help navigate the system, challenges understanding documentation requirements, or lower access to information about their rights and eligibility. Alternatively, having siblings is positively associated with early CSG receipt for children with adolescent CSG recipients, potentially reflecting prior family experience with grant applications, existing knowledge of the CSG system within the household, and possible existing relationships with SASSA offices. In addition, childcare support from the adolescent mother's caregiver increased the probability of selection into CSG receipt through caregiver CSG recipients. Caregiver support also increased the probability for early CSG receipt. This may be because these caregivers typically have prior experience with the CSG system, established documentation, stable housing, and may already be actively managing the child's needs, making them well positioned to manage the CSG and support adolescents in navigating the grant application process. Given that early CSG receipt is less likely for children who do not have siblings and those whose mothers have low levels of education, SASSA offices should continue to run outreach and information campaigns, particularly targeting children born to first-time adolescent mothers and adolescent mothers with lower levels of education, potentially through programmes that promote parental or provide mentor support.

Young mothers most in need of social assistance – those with low levels of education - are being systematically excluded from CSG receipt or face delays in accessing it. Moreover, children who are able to access the CSG and even those with early CSG receipt, still lack access to adequate housing and face issues of violence in the home. These findings point to broader systemic issues in South Africa's social protection system. Service delivery in South Africa is segmented, uncoordinated and instead of assisting, expects individuals and families facing acute stress to access and utilize them (Ndasana, Vallabh & Mxunyelwa, 2022). It fails to recognise the complexity of people's needs and the broader systemic issues – the interacting effect of economic, material, social, health, psychological, environmental, and political deprivation – which contribute to their

situation (Hochfeld, 2022). The needs of adolescent mothers and ultimately their children must be understood as shaped by broader structural inequalities, power disparities, and cultural differences (Wechsberg et al., 2024). Programmes like the CSG, which aim to provide essential support for children, can inadvertently reproduce and reinforce existing inequalities if they fail to take these realities into account (Barcelos, 2014).

The strongest predictor of CSG receipt is child's age. Children are less likely to have CSG receipt if they are aged under 1, suggesting significant delays in CSG receipt. As adolescent mothers aged, their child's likelihood of CSG receipt, particularly through adolescent CSG recipients increased, and the likelihood of CSG receipt through caregiver CSG recipients decreased. Moreover, it seems that when children are born to age eligible adolescent mothers (aged 16 +), instead of facilitating CSG receipt for adolescent CSG recipients, this transition became a barrier to CSG receipt and early CSG receipt, particularly through caregiver CSG recipients. Though there are strengths and weaknesses for each type of grant recipient, there is no reason to believe that adolescent CSG recipients should be recommended at the exclusion of others. Research on social security in South Africa has highlighted the essential role grandmothers play in families, (often left with the children of migrant mothers and fathers) as the provider of financial support and care of children. Between heads of households, young labour migrant mothers, and their older children, the management of the CSG has been found to be highly contested (Wright et al., 2015).This may explain some of the delay seen during adolescent mothers transition to age eligible status. While the CSG has largely been considered an instrument to protect children, it will also always be an instrument that protects the dignity of recipients, for instance, by alleviating some of the financial constraints to finding employment. Implementing social protection strategies should develop flexible CSG policies that recognize the essential role of different family members and also provide additional support systems to address the potential uncertainties when young mothers move away from home.

Conclusion

This chapter has provided a comprehensive analysis of CSG access patterns among adolescent and young mother-child dyads in South Africa. Through detailed examination of survey data from 971 children and 920 young mothers in the Eastern Cape, we have established several key findings. The findings largely support the initial hypothesis that adolescent mothers face distinct barriers contributing to delays in CSG access. The most disadvantaged children (those with mothers who have low education levels) are being systematically excluded from CSG receipt or face delays in accessing it. In contrast, children who receive some childcare support from the mother's caregiver face an increased probability of CSG receipt and early CSG receipt. The findings also highlight the

complex dynamics at play when adolescent mothers become age-eligible for direct CSG receipt. Rather than facilitating access, this transition appears to introduce new barriers, particularly for caregiver CSG recipients. While many children of disadvantaged young mothers living in informal housing and experiencing conflict and violence at home were able to access the CSG, the CSG alone does not ensure their freedom and dignity. This points to a need for more flexible and adaptive CSG policies that recognize the essential role of different family members and extend beyond material support, encompassing measures that empowers girls economically, and prevents domestic violence. Given the importance of prior knowledge and experience for early CSG receipt, SASSA offices should continue to run outreach and information campaigns, particularly targeting first-time adolescent mothers and those with low education levels.

3.1 Cash-plus Care: Evaluating the Efficacy of Cash Transfers and Formal Childcare for Child Development Outcomes

Investing in early childhood development (ECD) is recognized as having significant potential returns, especially in low- and middle-income countries where the detrimental effects of poverty on child development are profound (Slemming, Biersteker & Lake, 2024). Cash transfer programs, such as the CSG in South Africa, are designed to mitigate poverty and inequality, yet often fall short of addressing the full spectrum of needs for both children and their caregivers (Zembe-Mkabile, 2023a). While the CSG provides crucial financial support, it does not fully cover basic needs or address the structural issues that perpetuate poverty and inequality for children born to adolescent mothers (Fluks et al., 2024; Hall et al., 2024; Slemming, Biersteker & Lake, 2024).Though the CSG is critical to the prevention of deprivation, formal childcare can enable young mothers continued education and thus can promote the transformation of circumstances of exclusion and injustice (Hochfeld, 2022; Jochim et al., 2022, 2023a). Formal childcare presents an entry point that when designed with the CSG system linkage feature could enhance the effectiveness of social protection for children of adolescent mothers (Horwood et al., 2021; Huijbregts, Spadafora & Patel, 2023). This chapter's objective was to explore the relative efficacy of the CSG, alone and when combined with formal childcare, in improving the developmental outcomes of children born to adolescent mothers. The primary research question addressed in this chapter is: *What is the association between the CSG - both alone and when combined with formal childcare - and the cognitive scores of children born to adolescent mothers?* This chapter's hypothesis posits that CSG receipt, early CSG receipt and formal childcare for children born to young mothers is associated with higher cognitive development scores. Furthermore, it hypothesizes that the use of formal childcare enhances the positive effect of the CSG.

3.2 Early Child Development

Disparities in many aspects of development between children from low income and high-income backgrounds arise early and continue throughout the life course. In South Africa, the Thrive by Five study found that, for 4- to 5-year-olds in South Africa, only 41 percent were on track for cognitive and executive functioning, 55 percent were on track for skills in language and literacy, and 34 percent for skills in numeracy and mathematics. There are clear socioeconomic gradients in the learning outcomes of children, with more children from higher-income quintiles being on track with their learning (Giese et al., 2023). The significance of early childhood development in determining life-long human capital trajectories highlights the role family income plays in explaining the transmission of poverty through generations and is key to understanding the macro-level dynamics of productivity, growth and inequality (Attanasio, Cattan & Meghir, 2022b). Growing up in socio-economic hardship, young children experience poverty, malnutrition and stunting, lack of early education, and adversity in the home setting, such as parental depression, substance abuse and violence. Within the past 20 years, the number of interventions to promote early childhood development (ECD) have multiplied. Generally, programmes incorporate a range of diverse practices that target responsive care. The implementation of early childhood development intervention can produce both short-term improvements in school readiness and positive parenting and long-term improvements in learning ability, school achievement, cognition and emotional wellbeing throughout childhood, adolescence and adulthood - because it is the early years of brain development that is most critically impacted by environmental influence (Mamedova et al., 2024).

The interrelated nature of young children's physical, social, emotional, cognitive, and language development means that progression in one area of development can act as a catalyst for the progression of others. Early childhood development policies and intervention will therefore have the greatest impact when programmes work to integrate the environments that support young children. However, to ensure children are on track developmentally there is a need to assess progress towards this goal. This requires planning, monitoring and measurement at the population level, and this necessitates the design of an information system, involving a combined set of data sources. Government, funders and those designing and delivering services require clear, applicable and accessible data(Almeleh et al., 2024).The simplification of aggregating the performance on tasks into data on actual child development is designed to capture the productivity of different inputs (resources, investments, activities) at different stages in childhood and allows for more tractable economic analysis (Attanasio, Cattan & Meghir, 2022).

This kind of high-quality evidence on early childhood programmes come mostly from high-income countries. Although it is somewhat possible for evidence-based practice that promotes child cognitive development to be applied in low- and middle-income countries, these countries are extremely diverse and cover a large array of socio-cultural, economic and political realities and even evidence-based interventions require adaptations to the local sociocultural and low-resourced context. There is a need for feasible low-cost interventions in low-resource settings, but it is difficult to generalize findings across diverse contexts (Mamedova et al., 2024).

Measuring the Effect of CSG Receipt on Child Development

Historically, child development assessment in South Africa has focused on physical measurement like malnutrition and stunting indicators. This is also true for numerous other low- and middle-income countries. Both a consequence and cause of deprivation and disadvantage, stunting is comparable across countries through measurement indicators defined by a low height for child's age. Stunting has long-lasting negative effects on cognition and school achievement, resulting in poor labour market and health outcomes. Research has found that children in South Africa who experience stunting in their early childhood tend to make slower progress at school and be more prone to dropout. Preventing stunting is thus a priority and the CSG is regarded as a protective factor in some research using national survey data (Khan & Patel, 2024). However, other research has found no evidence of these protective effects (Devereux, 2023). The small size of the grant and the fact that it is not spend only on the child beneficiary, but also on the food and other needs of different household members, has been argued by Devereux (2023)as the reason for the CSG's limited impact.

The CSG has been found to have a positive effect on cognition and education. For instance, early CSG receipt has been found to be associated with higher grade attainment, specifically for females, and has shown to reduce the gaps in educational outcomes for children from low socio-economic settings(Heinrich, Hoddinott & Samson, 2012). In addition, mother recipients experiencing longer CSG eligibility have shown improved cognitive functioning in their middle age, particularly when they have had fewer children(Chakraborty et al., 2023, 2024). While there has been no research on the effects of the CSG specifically on the cognitive development of children, a study conducted in South Africa did find that cash transfers appear to improve the cognitive functioning of children. This effect is even greater when the cash grant was combined with good parenting, and the child was HIV-negative (Sherr, Macedo, Tomlinson, et al., 2017).Additionally, cash transfers when combined with food security have been associated with better school attendance and higher cognitive test scores for children in South Africa (Sherr et al., 2021b). While this research point to

the potential significant role that cash transfers play in ensuring optimal cognitive and education outcomes for children in low-resource settings, there is currently no research evaluating the effects of the CSG on the cognitive development of children born to adolescent mothers in South Africa.

3.3 Early Child Development Programmes

In South Africa, inequalities in education and socioeconomic inequalities, and therefore also education and racial inequalities, share strong associations. Unequal schooling systems exacerbate these inequalities, making it more challenging to offset them. Inequalities are present even in early childhood, before entry into primary education (Hall et al., 2019). Pre-school engagement with age-appropriate activities and interventions can reduce these early inequalities by promoting the cognitive development of children. From about three years of age, there is evidence that quality group learning programmes can improve the cognitive development of children. Early child development programmes are an important tool in disrupting intergenerational cycles of inequality through narrowing the gap in learning potential for children in low-resource settings before they reach the primary school level (Hall et al., 2024b).

The well-established evidence that early childhood development programmes can improve the healthy cognitive and social-emotional development of children, along with their literacy, numeracy and communication skills is growing (Ashley-Cooper, van Niekerk & Atmore, 2019a).New research is finding that specific design features of early learning programmes show stronger positive effects on measures of children's school readiness, including greater time spent in work with small groups, positive interpersonal relationships between children and with ECD practitioners, curriculum that distinguishes learning of specific skill domains like literacy and language, mathematics and self-regulation from the more general programme, and learning through play (Slemming, Biersteker & Lake, 2024).

Formal and informal childcare has been found to play a central role in supporting adolescent mothers return to school in South Africa (Jochim et al., 2023a). Formal childcare has been associated with higher odds of school enrolment and employment, grade advancement, and positive future ideations (Cluver et al., 2024). Childcare support is essential for the healthy development of adolescent mother-child dyads, with education and positive future ideation found to predict improved employment and earning throughout the life course, better birth spacing, diminished intimate partner violence and HIV exposure and improved health of children (Heymann et al., 2019). Compared to those without access, formal childcare was also found to promote positive parenting practice such as limit-setting and positive discipline (Cluver et al., 2024), which has been found to be protective of the relationship between mother and child, reduce

the occurrence of violence against children, and improve behavioural, cognitive and academic outcomes of children, along with their life-long earnings (Carroll, 2022; Heinen, Penna & Falcke, 2023; Buckley et al., 2024; Cluver et al., 2024).

Early Childhood Development at Home

Young children's care and stimulation takes place mostly at home with family members. Early learning centres typically do not have the necessary infrastructure, training and resources for high quality care of very young children(Sello et al., 2024). If the caregiver has the necessary capacity and support to provide responsive caregiving, care at home with a primary caregiver is usually the best practice of care for children three years or under. Programmes and initiatives that provide parenting support are recommended but there is little accurate data on what is available (Slemming, Biersteker & Lake, 2024).

While the home is an essential setting for the early care and learning of children within the first two years of life, in order to work and make a living, many parents have no choice but to place young children in formal childcare (Hall et al., 2024b).In 2016, about 20 percent of children under 3 years were attending some form of group care facility. Care arrangements outside of the home, like child minding and day care centres, need to provide age-appropriate care and play-based learning activities Structured group learning opportunities, like a playgroup, creche or nursery school can help to support the early social skills development of children but generally benefit children around the age of 3 – 6 years, that is, if they are of appropriate quality to support children's learning and development. In 2016, 67 percent of children aged 3 to 5 years were enrolled in an early learning programme. This rate was similar in 2022, although experiencing significant fluctuations between years. Improving access and quality of childcare and early learning facilities is important. There is also a need for additional social protection coverage for caregivers and families of young children to strengthen their capacity for nurturing care at home (Slemming, Biersteker & Lake, 2024).

Through connecting parents to childcare partners, such as teachers, healthcare workers, specialists, and other parents, early childhood development programmes can work to prevent isolation, build social support networks and enhance parenting (Ronaasen et al., 2021). Parent education programmes specifically provide parents with frequent engagement with childcare partners and other people outside the home. While this is important, particularly for young first-time mothers (Save the Children, 2022), parenting programmes can also expend the time available for school and leave an adolescent mother with no time for leisure, which can exacerbate maternal stress

(Evans, Jakiela & Knauer, 2021). While parenting programmes can help to ensure mothers have the tools needed to navigate stressful circumstances, they can also add to the stress mothers have over concerns regarding adequate childcare (Naiker et al., 2024). Reducing some of the financial and time constraints to adequate childcare may also help to improve parenting behaviour by lessening stress and cultivating feelings of competence, autonomy and agency in decision-making (Hochfeld, 2022).

A key factor in breaking the cycle of poverty amongst the poor is improving child development. There is a need for interdisciplinary research in economics and child development, further fieldwork, and better and more creative approaches (Attanasio, Cattan & Meghir, 2022a). These first two sections have reviewed the background literature on investment in early childhood development, the different measurements of child development, early child development programme structures, critical elements and effects and the need for home and family-based care. Having established this theoretical and contextual foundation, we now turn to the empirical analysis. The following section will detail the methodological approach used to examine the effect of CSG receipt and formal childcare on child development among children of adolescent mothers, including variable descriptions, selection and hypothesis, and analytical strategies employed to test the hypothesized relationships.

3.4 Data and Methodology

Variable Description, Selection and Hypothesis

- Child Development

The dependent variable of interest in this chapter analysis is child development. To measure this, standardized developmental assessments of all children were conducted using the Mullen Scales for Early Learning Composite Score (Mullen, 1995).Describing the generalized cognitive functioning (range 49–155) of children across several tasks relating to visual reception, fine motor, expressive language, and receptive language domains, the composite score combines (and transforms to age-standardized t-scores) scores relating to each domain. The Mullen Scales of Early Learning have shown good psychometric properties and have been adapted for and used in South Africa and other parts of sub-Saharan Africa (Bornman et al., 2018; Milosavljevic et al., 2019; Mebrahtu et al., 2020).

- Formal Childcare

Along with CSG receipt and early CSG receipt, the independent variable of interest in this chapter analysis is formal childcare, measured by asking adolescent mother's "How many days did your child attend a childcare centre, creche, or reception class last week?". Participant children were scored 0 if mothers indicated that their child attended zero days in the past week and 1 if they reported that their child attended a day or more of formal childcare.

- Covariates

All covariates have been detailed in Table 1 found in the method section of chapter 2. Based on previous research on the CSG and gender differences, we expect female children to show differential development patterns compared to male children (Oyenubi, 2021). The presence of siblings is hypothesized to positively impact child development, potentially due to increased opportunities for social interaction and learning, as well as caregivers' prior parenting experience. As expected developmentally, we hypothesize that child development scores will improve with increasing age. Additionally, higher levels of caregiver support are expected to positively influence child development outcomes, likely through enhanced attention, stimulation, and responsive care practices. We expect maternal age to have a positive association with child development, as older mothers may possess greater emotional maturity and resources to support their child's development. Maternal education is also hypothesized to positively impact child development outcomes, potentially through enhanced knowledge of child-rearing practices and better access to developmental resources. Conversely, poor maternal mental health is expected to negatively affect child development, potentially by compromising the quality of mother-child interactions and the consistency of responsive caregiving. Various indicators of household disadvantage are hypothesized to impact child development outcomes. We expect that living in informal housing and rural areas will negatively affect child development, potentially due to limited access to essential services and developmental resources. Food insecurity is hypothesized to have adverse effects on child development, both through direct nutritional pathways and increased household stress. Similarly, the presence of conflict or violence in the home is expected to negatively impact child development by creating an environment of toxic stress that may impair healthy development. These household-level disadvantages often co-occur, suggesting potential cumulative negative effects on child development outcomes.

Data and Data Analysis

From the sample of 970 children and 920 mothers used to explore the potential determinants of CSG receipt and early CSG receipt for children born to adolescent mothers, 21 observations were

dropped because these children were not assessed using the Mullen Scale of Early Learning (MSEL). A further 18 observations were excluded because child assessments had data collection errors. 15 observations were excluded because the child was assessed before CSG receipt was initiated.

Stata 17.0 was used to analyses this data. Initial data preparation involved assessing frequencies and distributions of variables to determine relevant covariates. While CSG receipt, and particularly early CSG receipt, is important for supporting positive child development, treating women as simple an instrument to benefit children can risk reinforcing gendered social norms, exacerbating gender and power differentials, and overburdening women with additional unpaid care responsibilities (Orozco Corona & Gammage, 2017). policies and infrastructure around care, like access to formal childcare, could help to reduce these gendered inequalities and improve the positive effect of CSG receipt on child development (Alarakhia, Ahmed & Tanima, 2024).

Preliminary analysis explores descriptive statistics of child development, formal childcare, CSG receipt, early CSG receipt and other relevant covariates. ***Final estimation results*** follow a hierarchical multivariable regression modelling strategy to examine the relationship between CSG receipt, formal childcare, and child development. Model 1 establishes the foundational relationship by examining child-level factors, providing baseline estimates of how individual characteristics influence development. Model 2 expands this by incorporating maternal factors, while Model 3 further includes household-level factors, thus controlling for potential confounders at multiple levels. Model 4 introduces the direct effect of CSG receipt on child development, followed by Model 5 which specifically examines early CSG receipt to understand timing effects. Model 6 then examines the independent effect of formal childcare attendance. The final model combines these elements and tests the moderation hypothesis by including both CSG receipt and formal childcare, along with their interaction term.

Method: Moderation Analyses

Moderation describes the influence of a variable M (formal childcare/ ECD) on the sign or strength of the association between X (CSG receipt) and Y (child development). This chapter analysis explores if formal childcare attendance (M) interacts with CSG receipt (X) to determine their conjoint influence on child development (Y).

Equation (1) for the linear moderation model is presented below:

$childdevelopment = \beta_0 + f(ECD)CSG + \beta_2(ECD) + ey$ ………………………………..……………(1)

The conditional effect of CSG receipt on child development at different levels of formal childcare ($\theta CSG \rightarrow childdevelopment$) is defined within the linear function of formal childcare, $f(ECD) = \beta_1 + \beta_3 ECD$, which when substituted into equation (1) yields:

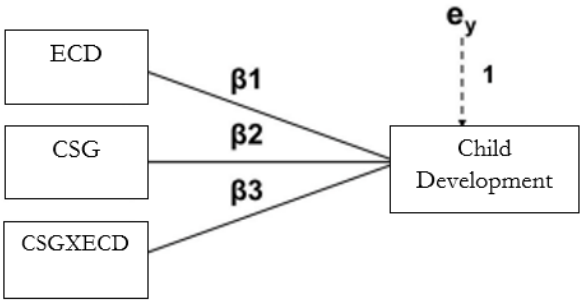
$$childdevelopment = \beta_0 + (\beta_1 + \beta_3 ECD)\, CSG + \beta_2 ECD + ey \quad \ldots\ldots(2)$$

As such, it is β_3 that determines the conditional effect of CSG receipt on child development. When $\beta_3 = 0$, the association between CSG receipt and child development is linearly independent from formal childcare. The linear moderation model tests if the effect of CSG receipt on child development by formal childcare is significantly different from zero. Taking equation (2) and distributing CSG receipt across β_1 and β_3ECD results in a simple linear moderation model with the interaction term CSGXECD representing the moderation effect (see figure 3):

$$childdevelopment = \beta_0 + \beta_1 childage + \beta_2 female + \beta_3 siblings + \beta_4 caregiversupport + \beta_5 grade9orless + \beta_6 poormentalhealth + \beta_7 informalhousing + \beta_8 rural + \beta_9 foodinsecure + \beta_{10} domesticconflict + \beta_{11} CSG + \beta_{12} ECD + \beta_{13} CSGXECD + echilddevelopment \quad \ldots\ldots(3)$$

This equation (3) allows us to calculate the regression coefficients for CSG receipt, formal childcare and CSGXECD as predictors of child development within a linear regression model, while controlling for child, mother and household level factors. The p-value or the confidence interval (CI) of the coefficient CSGXECD help to determine if the effect of CSG receipt on child development is linearly moderated by formal childcare (i.e. if CSG receipt and formal childcare interact).

Figure 2: The simple linear moderation model.



Equation (3) helps with the interpretation of the regression coefficients. The interpretation of β_{11} and β_{12} coefficients change when CSGXECD is included as a predictor in the regression, they are conditional effects. β_{11} is the conditional effect of CSG receipt on child development when formal

childcare = 0, while β_{12} is the conditional effect of formal childcare on child development when CSG receipt = 0.

The β_{13} coefficient for the interaction term CSGXECD describes how the linear relationship between CSG receipt and child development changes for a one-unit change in formal childcare. The effect of CSG receipt can be described as a difference in expected value of child development for two cases that differ on CSG receipt by one unit. β_3 describes how the effects of CSG receipt changes for a one-unit increase in formal childcare. This difference between difference approach helps to determine if the effect of CSG receipt on child development differs as a function of another variable (formal childcare). β_3 is the deviation from the sum of the independent effects of the interacting variables on child development (Bentley, Ramachandran & Salgado, 2022).

3.4 Estimation Results

Preliminary Analysis of Descriptive Statistics

Table 5 describes the samples used for the analyses: (1) a full sample of 917 children and (2) a subsample of 669 children that have CSG receipt (73% of the full sample). In the full sample, 48.7% of children were female, 43.4% were under one year of age, and 30.1% had siblings. Most children (72.6%) received some caregiver support. The mothers were in late adolescents (mean age = 18.18 years, SD = 1.73), with 43.2% having only completed up to grade 9 of schooling, and 14.7% experiencing poor mental health symptoms. Regarding household characteristics, 22.9% lived in informal dwellings, 28.4% in rural areas, 23.3% reported food insecurity, and 8.1% experienced conflict or violence at home. A quarter (25.3%) of children attended formal childcare. The CSG subsample showed similar characteristics, though with notably fewer children under one year (37.2%) and higher formal childcare attendance (29.1%). Among CSG recipients, 43.6% received the grant early. Mean child development scores were similar across both samples (full sample: M = 86.54, SD = 19.17; CSG sample: M = 85.84, SD = 19.20).

Table 7: Descriptive Statistics of Total and CSG Receipt Samples

	(1) Full Sample	(2) CSG Sample
Child is female	48.7%	48.6%
Child is aged under 1 year (mean(sd))	43.4%	37.2%
Child has siblings	30.1%	32.0%
Child receives some caregiver support	72.6%	72.9%
Mothers age (mean (sd))	18.18(1.73)	18.37(1.73)
Mothers highest school grade is 9 or less	43.2%	40.1%
Mother is experiencing poor mental health symptoms	14.7%	14.1%
Home is an informal dwelling	22.9%	23.8%
Home is in a rural area	28.4%	29.0%
Household is food insecurity	23.3%	23.3%
Conflict or violence at home	8.1%	9.3%
Formal childcare	25.3%	29.1%
early CSG receipt		43.6%
Child has a CSG receipt	73.0%	
Child development (mean (sd))	86.54 (19.17)	85.84 (19.20)
N	917	669

Note. This table shows descriptive statistics of child-level and mother-level factors for children from the full sample and those from the sample of just the CSG beneficiaries. Binary variables report the number (n) and percentage (%) of participants with a score of 1, and the continuous variables presents the mean and standard deviation (SD). Significance is denoted by ***p < 0.01, **p < 0.05, and *p < 0.10. 669 out of 917 children had CSG receipt.

Final Estimation Results for Moderation Analysis

Table 8 shows a series of multivariable regression models examining the relationships between child development outcomes and various predictors, including CSG receipt, early CSG receipt, formal childcare, and the interaction between CSG receipt and formal childcare.

Age is a strong predictor of child development scores. Children under 1 year old have significantly higher scores compared to older children (by 10-15 points) across all models.

Maternal education is consistently associated with child development. Children whose mothers have grade 9 education or less score 3-5 points lower on average. This highlights the important role of maternal human capital in shaping child outcomes.

Early CSG receipt (Model 5) is associated with a 3.4 point higher development score, suggesting potential benefits of timely grant access. However, CSG receipt in general (Models 4 and 7) shows

no significant relationship with development scores - whether alone or when combined with formal childcare.

Formal childcare (Model 6) is linked to a 5.4 point increase in development scores, indicating positive impacts of early childhood education and care services. The interaction between CSG receipt and formal childcare (Model 7) is not statistically significant, providing no evidence of moderation effects. In other words, the impact of CSG does not seem to differ based on childcare use.

Child characteristics like gender and having siblings do not show significant associations with development scores in any of the models. Household factors like informal housing, rural location, food insecurity, and domestic conflict also do not emerge as significant predictors, suggesting that the child and mother-level factors are more influential in this sample. While CSG receipt alone showed a non-significant negative association with development scores, the interaction between CSG and formal childcare showed a positive but non-significant trend. The models explain between 10-14% of the variance in child development scores (R-squared), indicating that while the included predictors are relevant, there are likely other important factors not captured here.

Table 8: Multivariable Regression Analysis of Standardized Cognitive Development Scores and CSG Receipt, Early CSG Receipt, Formal Childcare and Moderation Analysis of Formal Childcare on the Relationship between CSG Receipt and Cognitive Development Scores

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5	(6) Model 6	(7) Model 7
Child is female	-0.433	-0.385	-0.381	-0.392	-0.803	-0.585	-0.614
	(1.211)	(1.205)	(1.210)	(1.210)	(1.437)	(1.204)	(1.204)
Child aged under 1 year	11.646***	12.569***	12.700***	12.597***	9.691***	14.479***	14.341***
	(1.237)	(1.318)	(1.325)	(1.343)	(1.642)	(1.416)	(1.428)
Child has siblings	0.240	0.033	-0.067	-0.052	-2.210	0.081	0.190
	(1.341)	(1.363)	(1.374)	(1.375)	(1.613)	(1.366)	(1.367)
Child receives some caregiver support	0.833	0.679	0.654	0.676	-0.798	0.546	0.548
	(1.367)	(1.362)	(1.378)	(1.379)	(1.669)	(1.370)	(1.370)
Mothers age		0.614	0.639	0.655	0.740	0.546	0.558
		(0.402)	(0.404)	(0.406)	(0.475)	(0.403)	(0.404)
Mothers highest school grade is 9 or less		-4.241***	-4.035***	-4.085***	-5.558***	-3.457***	-3.626***
		(1.263)	(1.288)	(1.293)	(1.549)	(1.291)	(1.296)
Mother is experiencing poor mental health symptoms		-0.756	-0.746	-0.793	-0.550	-1.154	-1.114
		(1.712)	(1.722)	(1.726)	(2.097)	(1.716)	(1.720)
Home is an informal dwelling			-1.776	-1.738	-0.041	-1.659	-1.610
			(1.477)	(1.479)	(1.753)	(1.468)	(1.470)
Home is in a rural area			0.037	0.061	-0.096	0.224	0.184
			(1.377)	(1.379)	(1.640)	(1.371)	(1.372)
Household is food insecurity			1.093	1.070	1.379	1.328	1.299
			(1.472)	(1.473)	(1.751)	(1.465)	(1.465)
Conflict or violence at home			1.401	1.488	1.445	1.767	1.947
			(2.240)	(2.248)	(2.524)	(2.229)	(2.236)
CSG receipt				-0.668			-1.917
				(1.404)			(1.534)
Early CSG receipt					3.452**		
					(1.518)		
Formal childcare						5.268***	0.851
						(1.540)	(3.316)
CSG X Formal childcare							5.465
							(3.583)
Observations	917	917	917	917	669	917	917
R-squared	0.092	0.109	0.112	0.112	0.094	0.123	0.126

Notes. This table presents the marginal effects from the multiple variable regression models examining the relationship between CSG receipt and child development. Standard errors are shown in parentheses below the marginal effects. Statistical significance is denoted by *** p<0.01, ** p<0.05, * p<0.1. Model 1 includes all child level factors, and these are included along with mother level factors in model 2, and household level factors in model 3. Model 4 adds CSG receipt on its own, and model 5 adds formal childcare on its own. Model 6 looks at the moderation effect of formal childcare on the relationship between CSG receipt and child development.

4.1 Discussion of Study Results

This thesis has explored CSG receipt barriers, facilitators, and associations with child development for children born to adolescent mothers, and the moderating role of formal childcare. Chapter 1 provided an introduction to the study, highlighting the socioeconomic challenges faced by adolescent mothers and their children, and outlining the research questions and objectives. Chapter 2 investigated the barriers and facilitators of CSG access, revealing significant delays in grant receipt for children of adolescent mothers, particularly for first-time mothers with lower maternal education and limited caregiver support. Chapter 3 examined the association between CSG receipt, formal childcare, and child development outcomes, finding that early CSG receipt and formal childcare both had positive effects on cognitive development, though the CSG alone did not show a significant relationship with child development. Building on these findings, Chapter 4 synthesizes the results, discusses the study's limitations, and provides policy recommendations for improving the CSG programme. This chapter also reflects on the broader implications of the findings for social protection systems and early childhood development interventions in South Africa, emphasizing the need for more flexible and integrated approaches to support adolescent mothers and their children.

Formal childcare appears to serve a dual beneficial role: it facilitates young mothers' return to education while simultaneously supporting child development (Jochim et al., 2022; Cluver et al., 2024). Given the significant negative association between low maternal education and child development outcomes, childcare access represents a crucial intervention and highlights the important role of maternal human capital in shaping child outcomes.

The design of effective policies demands an understanding of the changes in human development that comes with age and how socioeconomic conditions impact these developmental stages. Economists and policymakers must acknowledge these developmental complexities if they are to recognise windows of opportunity for effective action. Delays in grant initiation were associated with poorer child development outcomes, emphasising the critical nature of early intervention. Intervention starting during pregnancy or prior to conception are crucial to ensure children reach their full potential because developmental deficits that emerge in the early years can limit the effectiveness of later investments (Chersich et al., 2016; Moolla et al., 2024; Slemming, Biersteker & Lake, 2024). However, CSG receipt in general shows no significant relationship with child development.

There has been considerable policy attention paid to extending the coverage of cash transfers. Far less attention has been given to transfer adequacy (Devereux, 2023). For instance, although two

thirds of children in South Africa are now CSG beneficiaries, there has been no drop-in rates of child malnutrition since its introduction (Zembe-Mkabile, 2023b). This is not surprising, given that the grant can cover the costs of only two-thirds of an adequately nutritional diet and is typically also spent on other family members' food and non-food needs (Devereux, 2023). Additionally, while cash transfer programs have in general been effective in meeting basic consumption needs and achieving key development goals such as health, food security, and education, they often fall short in addressing complex social issues like emotional, social, and cognitive needs (Huijbregts, Spadafora & Patel, 2023). Profound challenges such as malnutrition and violence against children cannot be adequately tackled by cash alone (Huijbregts, Spadafora & Patel, 2023). The deprivation experienced by children of adolescent and young mothers is driven not only by financial constraints but also by structural limitations, necessitating a more comprehensive approach beyond monetary assistance (Revenga & Dooley, 2020; Diallo, 2024).

The challenges facing young mother-child dyads extend beyond simple income poverty. These mothers face compound disadvantages: interrupted education due to childcare responsibilities places young mothers at elevated risk of long-term unemployment and persistent poverty. Cash transfers like the CSG serve multiple functions in this context. Beyond providing direct economic support, which can reduce household tension and increase women's ability to leave violent situations (Cookson, Fuentes & Bitterly, 2024), cash transfers can function as a critical entry point for reconnecting marginalized young mothers with broader social services. For adolescent mothers who are at risk of disconnection from education and employment opportunities, and of developing distrust in formal support systems, the CSG could serve as a gateway to more comprehensive support (De Lannoy, et al., 2024). As Hochfeld (2022) argues, CSG receipt should automatically qualify recipients for an integrated package of social services, eliminating the need to navigate complex bureaucratic systems while in crisis.

4.2 Study Limitations and Strengths

This study has several limitations. First, as the study followed a cross-sectional study design, it is challenging to infer about the direction of the association. For instance, a well-developing child might make it easier for the young mother to engage in the CSG application process. While some of our hypotheses, like the impacts of CSG access on child development, have been theorized based on prior evidence, there is also a third wave of the HEY BABY study currently underway, which is collecting data for future longitudinal analysis which could help us infer temporal relationships. Second, there was also the potential for an omitted variable to bias the results. For instance, children of adolescent mothers who received the CSG earlier in life may have more eager

and supportive mothers and caregivers, which would result in improved child development (Aguero et al., 2006). However, this analysis tried to account for this potential bias by controlling for other factors that influence CSG receipt and child development outcomes. Third, some questions require recall from adolescent mothers, such as the age at CSG initiation, which limits the accuracy of the data used. While acknowledging the possibility of recall bias in the reported age at which children first receive the CSG, there is no compelling evidence to suggest that such measurement error systematically skews above or below the true value. Consequently, this study assumes that any recall bias present in the data is non-systematic and is unlikely to have a large impact on the regression results (Wooldridge, 2016). Fourth, while only children who fell into the age range for the MSEL were included in this study, previous research done by Yitzhak et al. (2016) found that MSEL scores are affected by ceiling effects. This means that older and more cognitively able children within our sample might have MSEL scores that are underestimated. However, this study tried to account for this by controlling for the child's age within all regressions looking at child development scores. Fifth, a potential drawback of this study is our measure of cognitive development which was adapted from the Global North (Mullen, 1995), although previously successfully used across Sub-Saharan Africa (Boivin et al., 2019; Bornman et al., 2018; Mebrahtu et al., 2020; Milosavljevic et al., 2019). Cognitive measures in the global south that are introduced from 'afar' might not capture the diversity, cultural context, and needs of local realities including gender and power dynamics which are particularly influential in adolescent motherhood (Jain et al., 2019). Children and adolescents across Africa are less likely to have access to social security support, they are more likely to be homeless or working, maternally or paternally orphaned and might function as the heads of households. Without acknowledgement of these contextual factors, the 'northern bias' cognitive measures might lack the 'quality' for local communities because they do not reflect the realities of children, nor the cultural agendas that shape their daily lives. It will remain important to develop local measures of development that consider these issues and allow future research to determine associations of these measures and social support access. Sixth, while this study refers to "child development" as the outcome of interest, the measure employed (Mullen Scales of Early Learning Composite Score) focuses exclusively on cognitive functioning across language, visual reception, and fine motor domains. This represents a significant limitation as child development is a multidimensional construct that encompasses social-emotional development, physical growth, behavioral regulation, and adaptive functioning, among other domains. The exclusive focus on cognitive measures means that the study may miss important effects of CSG receipt and formal childcare on other aspects of child development that are equally important for children's overall well-being and future outcomes. For instance, cash transfers and childcare may

have differential impacts on children's social skills, emotional regulation, or behavioral development that would not be captured by cognitive assessments alone. Future research should employ more comprehensive measures of child development that include social-emotional, behavioral, and physical development indicators to provide a more holistic understanding of how social protection interventions affect children's overall development. Seventh, this study does not adequately account for the role of stigma associated with teenage motherhood in shaping adolescent mothers' engagement with state services. The pervasive stigma surrounding teenage pregnancy and motherhood represents a significant unmeasured variable that likely influences both CSG access patterns and broader service engagement. Research in South Africa has consistently documented how stigma creates barriers for adolescent mothers accessing health and social services (Erasmus et al., 2020; Field et al., 2020; Jonas et al., 2017; Muthelo et al., 2024; Nyblade et al., 2022). This limitation is particularly significant because stigma could systematically bias the findings by underestimating the true barriers to CSG access, misattributing delays to individual factors (such as low education) rather than structural discrimination, and overlooking the psychological burden that stigma places on young mothers' capacity to engage with services. Future research should explicitly examine how stigma operates as a barrier to service access and consider how anti-stigma interventions might improve outcomes for adolescent mother-child dyads.

This study, despite its limitations, holds significant strengths. Notably, it is the pioneering endeavour of its kind in the Global South, breaking new ground in research on the CSG's impact. Uniquely, in exploring the connection between CSG receipt and child development outcomes for children of adolescent and young mothers, the study innovatively explores the influence of CSG recipient type on the timing of grant access. The sampling strategy employed ensures the inclusion of even the most vulnerable and hard-to-reach young mothers, enhancing the study's robustness. This approach aligns with the study's commitment to encompassing diverse perspectives and in addressing potential biases in the existing literature.

This study makes a unique contribution to the field by addressing critical gaps in our understanding of early childhood development support for children born to adolescent and young mothers in South Africa. Unlike previous research on the CSG in South Africa, this study employs a comprehensive cognitive assessment tool, the Mullen Scales of Early Learning, to measure child development outcomes. This allows for a more nuanced understanding of how social assistance programs support child development. In South Africa, child development data has been collected predominately in early learning programmes. However, there is limited data on the child development outcomes of the 30 percent of 3- to 5-year-olds not attending early learning

programmes and for children under 4-years (Hall et al., 2024a). This study thus makes important contributions to our knowledge on the development outcomes of young children, and those not attending early learning programmes. Furthermore, this study is distinctive in its approach to evaluating the CSG. It not only examines the effects of the CSG in isolation but also investigates its impact when combined with formal childcare. This multi-faceted approach provides invaluable insights into how different forms of support can interact to benefit young mothers and their children, offering a more holistic view of effective intervention strategies.

4.3 Study Conclusion and Recommendations for the CSG programme

The Child Support Grant (CSG) has been a crucial intervention in alleviating some of the financial burdens faced by adolescent mothers and their caregivers. However, our results suggest that the potential for social protection systems to respond to the needs of adolescent mother-child dyads exceeds their current applications. The research findings highlight potential knowledge gaps as a barrier to CSG receipt and early CSG receipt. Children with adolescent mothers who have low levels of education, precisely those children most vulnerable to poor development outcomes, are being excluded from or face delays in CSG receipt. Information and outreach campaigns, potentially through interventions that promote parental and mentor support, should be provided to adolescent-mother child dyads and targeted at first-time mothers and mothers with low levels of education.

Young mothers' disadvantage may increase the likelihood of eligibility and higher need may also drive higher uptake. However, factors like informal housing may be less of a determinant for adolescent CSG recipients, as its effect on CSG receipt is present particularly for caregiver CSG recipients. Traditional means testing methods may not as accurately reflect young people's socio-economic circumstances since they often lack control over household income and resources, don't own their housing, and may be financially dependent on others while having limited access to the household wealth that's being assessed. Developing alternative assessment criteria presents an important opportunity to both better target support and monitor broader outcomes for both adolescent mother and child. Specifically, children born to adolescent mothers who are exposed to conflict and violence at home are more likely to have CSG receipt than those not experiencing domestic violence, possibly driving their need for social security. If the aim is to equip the future leaders of this country with the capabilities to interrogate structures and systems and to innovate, their rights must be taken seriously (Boadu & Alaji, 2023). The CSG receipt should automatically entitle CSG recipients to a range of social services that are necessary to address the broader systemic issues that contribute to their situation (Hochfeld, 2022).

While expanding assessment criteria could better identify needs, adding eligibility requirements risks creating more barriers to CSG receipt for children born to adolescent mothers. This is evidenced by the existing barrier and delay at the transition where children are born to adolescent mothers aged 16 and older - at the point at which adolescents have become age eligible for direct CSG receipt. This affects children who have CSG receipt through caregiver CSG recipients in particular. CSG policies should be made more flexible to recognize and accommodate the complex family structures that support child wellbeing. This flexibility would help ensure that support reaches children through the most effective channels within their support network.

A progressive design feature is the gender-neutral language of the CSG and its distribution to a primary caregiver, biological or not. However, CSG recipients are mostly women (96%) and are typically the child's biological mother or grandmother (de Koker, de Waal & Vorster, 2006). The designation of women as primary caregivers, often performing unpaid care work with limited support in challenging environments, affects their economic and social opportunities (Hochfeld, 2022). This creates significant challenges in balancing parenting responsibilities with financial needs (Spjeldnæs, 2021). While individuals may develop strategies to manage these circumstances, such approaches are limited within a system that primarily values economic participation through paid labour (Luxton & Bezanson, 2006; Scarlato & d'Agostino, 2019). Educational and developmental trajectories of adolescent mothers directly impact their children's development. Supporting the educational and other outcomes of adolescent mothers would help ensure that support systems don't inadvertently reinforce gender inequalities by treating mothers solely as instruments for child wellbeing (Molyneux & Thomson, 2011; Orozco Corona & Gammage, 2017).

Early CSG receipt and formal childcare both had significant positive effects on child development. Formal childcare appears to serve a dual beneficial role: it facilitates young mothers' return to education while simultaneously supporting child development (Jochim et al., 2022; Cluver et al., 2024). Given the significant negative association between low maternal education and child development outcomes, childcare access represents a crucial intervention and highlights the important role of maternal human capital in shaping child outcomes. Although formal childcare is only recommended for children from around the age of 3 years, 82 percent of this studies sample was under 3 years at the interview date. To improve policies and infrastructure around care and the quality of life of women in South Africa, there is a need for programme coordination, implementation and evaluation of a range of support services that are gender-sensitive and age-responsive (Alarakhia, Ahmed & Tanima, 2024). But it is not only the issues in the care economy which need to be tackled. Agents in development should look to transform social norms that

maintain and legitimize mens lack of engagement in caregiving (Slemming, Biersteker & Lake, 2024).

4.4 Conclusion

This study has provided a comprehensive analysis of the barriers, facilitators, and delays in accessing the CSG for children of adolescent mothers in South Africa, while also exploring the broader implications of social protection systems on child development. The findings underscore the critical role of maternal education, family support structures, and early intervention in shaping access to the CSG and its impact on child development outcomes. First time adolescent mothers, mothers with lower levels of education and mothers who do not receive childcare support from their caregiver face significant barriers to accessing the CSG, possibly due to knowledge gaps and limited support in navigating the application process. These barriers contribute to delays in CSG receipt for some of the most vulnerable children, exacerbating existing inequalities. To address these challenges, the study recommends targeted outreach and information campaigns, particularly for first-time adolescent mothers and those with low education levels, potentially through promoting caregiver support, to bridge knowledge gaps and facilitate early CSG access.

The study highlights the importance of early CSG receipt and formal childcare in promoting positive child development outcomes. Formal childcare not only supports child development but also facilitates young mothers' return to education, thereby addressing the dual issues of interrupted education due to childcare responsibilities and the need for ECD programmes for children born to adolescent mothers (Jochim et al., 2023b; Cluver et al., 2024). The CSG alone is insufficient to address the complex social, economic, and structural issues faced by adolescent mothers and their children. Issues such as inadequate housing and domestic violence are more prevalent amongst CSG recipients compared to non-recipients, pointing to the need for a more integrated and comprehensive approach to social protection. The CSG should be integrated with a broader package of social services, including childcare support, safe housing, and interventions to address domestic violence. Such an integrated approach would not only enhance the effectiveness of the CSG in promoting child development but also empower adolescent mothers and their caregivers, economically and socially, addressing cycles of poverty and inequality across generations.

The findings also reveal the complexities of family dynamics and the contested nature of CSG management, particularly during the transition when adolescent mothers become age-eligible for direct CSG receipt. This transition seems to introduce new barriers, especially for caregiver CSG recipients, highlighting the need for more flexible and adaptive CSG policies that recognize the

diverse roles of family members in supporting child well-being. For instance, acknowledging the heightened needs of adolescent mothers and recognising the need for flexible CSG policy, the CSG top-up programme design feature could augment the grant amount and allocate a portion to both the adolescent mother and her primary caregiver.

In conclusion, while the CSG has been a vital tool in alleviating financial burdens for adolescent mothers and their children, its potential to address the broader systemic issues faced by these families remains underutilized. By adopting a more holistic and flexible approach to social protection, South Africa can better support the development and well-being of its most vulnerable children and their mothers.

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APPENDIX A: Probit Model Building

1A. Preliminary Estimation Results

The analytical strategy progressed through several stages. First, preliminary estimation used probit regressions to explore associations with CSG receipt and early CSG receipt.

Probit regression exploring the associations with CSG receipt (Table 1A). Model 1 (Child Level Factors): Female child showed no effect, while having siblings increased receipt probability by 8.6 percentage points ($p < 0.01$). Neither mother's age at child's birth nor caregiver support showed significant effects.

Model 2 (1 + Adolescent Mother Level Factors): Lower maternal education (grade 9 or less) significantly decreased receipt probability by 11.2 percentage points ($p < 0.01$). Sibling effect remained significant (9.4 percentage points, $p < 0.01$).

Model 3 (household factors): Lower maternal education maintained its negative effect (-11.9 percentage points, $p < 0.01$), while siblings remained significant (9.0 percentage points, $p < 0.01$). Informal housing, rural residence, and food insecurity showed no significant effects.

Model 4 (exclusion criteria): Being under 1 year decreased receipt by 11.0 percentage points ($p < 0.01$), while each additional year of maternal age increased it by 3.4 percentage points ($p < 0.01$). Lower education (-9.2 percentage points, $p < 0.01$) and being born to a mother aged 16+ (-9.4 percentage points, $p < 0.05$) showed negative associations.

Model fit improved with each addition, Pseudo R-squared increasing from 0.007 to 0.063 ($p < 0.01$), highlighting the importance of these factors in explaining CSG receipt variation.

Table 1A: CSG Receipt Probit Regression Model

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4
Child is female	-0.005	-0.001	-0.007	-0.018
	(0.028)	(0.028)	(0.028)	(0.027)
Child has siblings	0.086***	0.094***	0.084***	0.037
	(0.031)	(0.031)	(0.031)	(0.031)
Child was born when mother was aged 16 or older	-0.010	-0.050	-0.054	-0.093**
	(0.034)	(0.035)	(0.035)	(0.041)
Child receives some caregiver support	0.014	0.007	0.013	0.027
	(0.031)	(0.031)	(0.031)	(0.031)
Mothers highest school grade is 9 or less		-0.112***	-0.120***	-0.093***
		(0.029)	(0.029)	(0.029)
Home is an informal dwelling			0.057*	0.048
			(0.034)	(0.033)
Home is in a rural area			0.039	0.047
			(0.032)	(0.031)
Household is food insecurity			-0.003	-0.028
			(0.034)	(0.033)
Conflict or violence at home			0.130**	0.130**
			(0.056)	(0.055)
Child aged under 1 year				-0.112***
				(0.031)
Mothers age				0.034***
				(0.011)
Observations	971	971	971	971
Chi-squared	7.803	22.45	31.60	75.85
Pseudo R-squared	0.00703	0.0202	0.0285	0.0683
P-value	0.099	0.000	0.000	0.000

Note. This table presents the marginal effects from probit regression models examining factors associated with CSG receipt. Standard errors are shown in parentheses below the marginal effects. Binary variables show the change in probability of CSG receipt when moving from 0 to 1. Maternal age shows the change in probability for each additional year. Statistical significance is denoted by *** p<0.01, ** p<0.05, * p<0.1. Model 1 includes basic child characteristics, model 2 includes child CSG eligibility requirements, model 3 includes mother level factors, and model 4 includes household level factors. The lower panel shows model fit statistics, including Chi-squared and Pseudo R-squared values. Significant increases in Pseudo R-squared are observed with every addition to the model, at $p < 0.01$, indicating improved model fit.

Given the presence of siblings in the sample, family-level correlation was tested using cluster-robust standard errors (see Table 2A). However, as clustering showed no substantial impact on standard errors or significance, it was excluded from final models.

Table 2A: CSG Receipt Probit Regression Model with Family Level Clustering

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 3
Child is female	-0.005	-0.001	-0.007	-0.018
	(0.028)	(0.028)	(0.028)	(0.027)
Child has siblings	0.086***	0.094***	0.084***	0.037
	(0.032)	(0.032)	(0.032)	(0.032)
Child was born when mother was aged 16 or older	-0.010	-0.050	-0.054	-0.093**
	(0.034)	(0.035)	(0.035)	(0.041)
Child receives some caregiver support	0.014	0.007	0.013	0.027
	(0.033)	(0.033)	(0.033)	(0.032)
Mothers highest school grade is 9 or less		-0.112***	-0.120***	-0.093***
		(0.029)	(0.030)	(0.030)
Home is an informal dwelling			0.057	0.048
			(0.036)	(0.035)
Home is in a rural area			0.039	0.047
			(0.032)	(0.031)
Household is food insecurity			-0.003	-0.028
			(0.034)	(0.033)
Conflict or violence at home			0.130**	0.130**
			(0.058)	(0.057)
Child aged under 1 year				-0.112***
				(0.030)
Mothers age				0.034***
				(0.010)
Observations	971	971	971	971
Chi-squared	7.053	23.39	27.78	68.84
Pseudo R-squared	0.00703	0.0202	0.0285	0.0683
P-value	0.133	0.000	0.001	0.000

Note. This table presents the marginal effects from probit regression models examining factors associated with CSG receipt. Standard errors are shown in parentheses below the marginal effects. Binary variables show the change in probability of CSG receipt when moving from 0 to 1. Maternal age shows the change in probability for each additional year. Statistical significance is denoted by *** p<0.01, ** p<0.05, * p<0.1. Model 1 includes basic child characteristics, model 2 includes child CSG eligibility requirements, model 3 includes mother level factors, and model 4 includes household level factors. The lower panel shows model fit statistics, including Chi-squared and Pseudo R-squared values. Significant increases in Pseudo R-squared are observed with every addition to the model, at $p < 0.01$, indicating improved model fit.

Model diagnostics Model diagnostics were conducted for the CSG receipt probit model (see Table 1A in Appendix). The model showed good overall fit (LR $\chi^2(11) = 75.85$, $p < 0.001$; Pearson $\chi^2(595) = 611.81$, $p = 0.3078$) and correctly classified 73.74% of cases. However, detailed diagnostics revealed concerning patterns: 49 cases with Pearson residuals > |2| and 27 cases >

|2.26|, all being CSG non-recipients with residuals ranging from -2.27 to -4.46. Leverage values for these cases clustered tightly (0.126-0.148). While demonstrating high sensitivity (97.50%), the model's poor specificity (5.58%) indicated difficulty predicting non-receipt, as shown in the ROC curve (AUC = 0.6830) (Figure 1A) and sensitivity/specificity plot (Figure 2A).

Figure 1A: CSG Receipt Probit Model
Receiver Operating Characteristic (ROC)

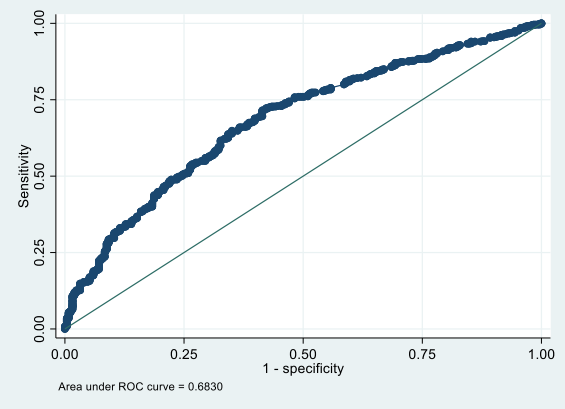
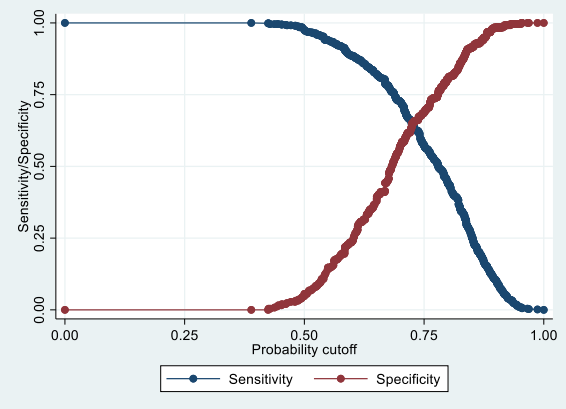
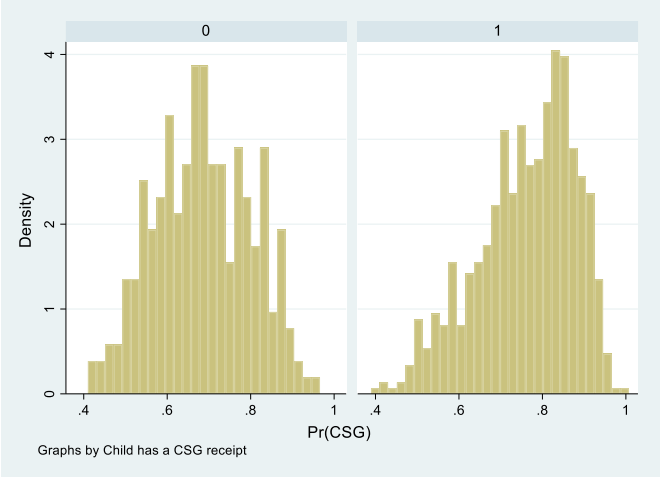


Figure 2A: CSG Receipt Probit Model
Sensitivity/Specificity plot



This systematic pattern of residuals among non-recipients, combined with their consistent leverage values, suggested underlying selection bias rather than random outliers - a conclusion reinforced by the contrasting probability distributions between recipients and non-recipients (Figure 3A).

Figure 3A: CSG Receipt Probit Model Histogram of predicted probabilities by CSG



Multivariable hierarchical probit regression exploring the associations with early CSG receipt (Table 3A). Model 1 (Child Level Factors): Only caregiver support showed significance, increasing early receipt likelihood by 12.9 percentage points ($p < 0.01$). Child gender, siblings, and maternal age at birth showed no significant effects.

Model 2 (1 + Adolescent Mother Level Factors): Caregiver support maintained its positive effect (13.0 percentage points, $p < 0.01$). Maternal education and mental health symptoms showed no significant associations.

Model 3 (household factors): Caregiver support remained the strongest predictor (13.6 percentage points, $p < 0.01$). Neither household factors (informal dwelling, rural residence, food insecurity) nor domestic violence showed significant associations.

Model fit improved modestly across specifications, with Pseudo R-squared increasing from 0.0121 to 0.0170, and chi-squared improving from 11.92 to 16.75. The consistently significant caregiver support effect suggests the importance of support networks in facilitating early grant access, though overall model fit remained relatively low.

Table 3A: Early CSG Receipt Probit Regression Model

	(1) Model 1	(2) Model 2	(3) Model 3
Child is female	0.012	0.011	0.011
	(0.037)	(0.037)	(0.037)
Child has siblings	0.010	0.008	0.005
	(0.039)	(0.039)	(0.039)
Child was born when mother was aged 16 or older	-0.060	-0.067	-0.070
	(0.044)	(0.045)	(0.045)
Child receives some caregiver support	0.129***	0.130***	0.136***
	(0.041)	(0.041)	(0.042)
Mothers highest school grade is 9 or less		-0.019	-0.034
		(0.039)	(0.040)
Mother is experiencing poor mental health symptoms		0.028	0.030
		(0.050)	(0.050)
Home is an informal dwelling			0.063
			(0.044)
Home is in a rural area			-0.021
			(0.041)
Household is food insecurity			0.040
			(0.044)
Conflict or violence at home			-0.061
			(0.065)
Observations	720	720	720
Chi-squared	11.92	12.45	16.75
Pseudo R-squared	0.0121	0.0127	0.0170
P-value	0.018	0.053	0.080

Note. This table presents the marginal effects from probit regression models examining factors associated with Early CSG receipt. Standard errors are shown in parentheses below the marginal effects. Binary variables show the change in probability of CSG receipt when moving from 0 to 1. Maternal age shows the change in probability for each additional year. Statistical significance is denoted by *** p<0.01, ** p<0.05, * p<0.1. Model 1 includes basic child demographics, model 2 includes child CSG eligibility requirements, model 3 includes mother level factors, and model 4 includes household level factors. The lower panel shows model fit statistics, including Chi-squared and Pseudo R-squared values. Significant increases in Pseudo R-squared are observed with every addition to the model, at $p < 0.01$, indicating improved model fit.

Model diagnostics of the early CSG initiation models demonstrated poor model fit (LR $\chi^2(10) = 16.75$, $p = 0.0800$) with only caregiver support showing significance ($p = 0.002$), despite adequate goodness-of-fit (Pearson $\chi^2(246) = 265.84$, $p = 0.1837$). Classification performance was weak with 57.78% accuracy, showing highly imbalanced prediction (18.51% sensitivity, 87.14% specificity) and poor discrimination as evidenced by the ROC curve (AUC = 0.5811, Figure 4A) and sensitivity/specificity plot (Figure 5A). No cases showed Pearson residuals > |2|, and leverage values were small (75% < 0.022, maximum 0.099).

Figure 4A: Early CSG Receipt Probit Model
Receiver Operating Characteristic (ROC)

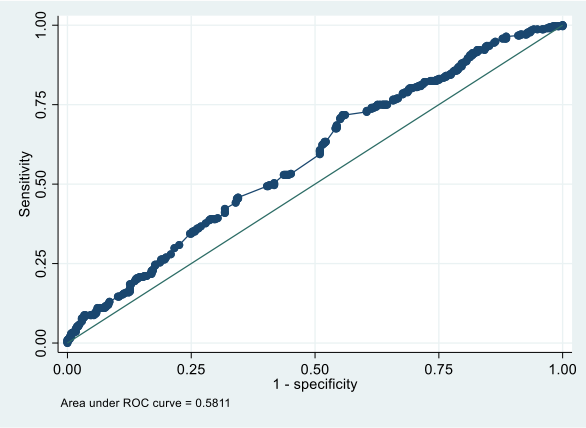
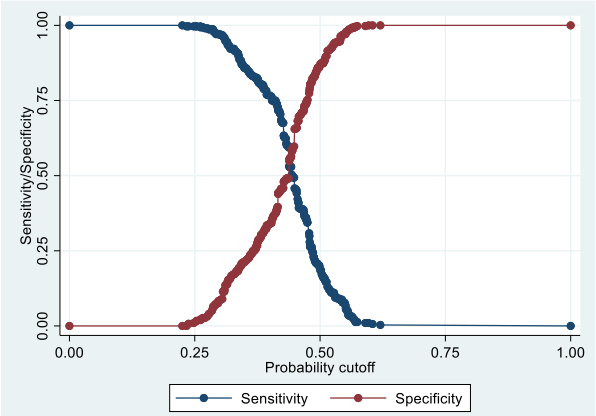
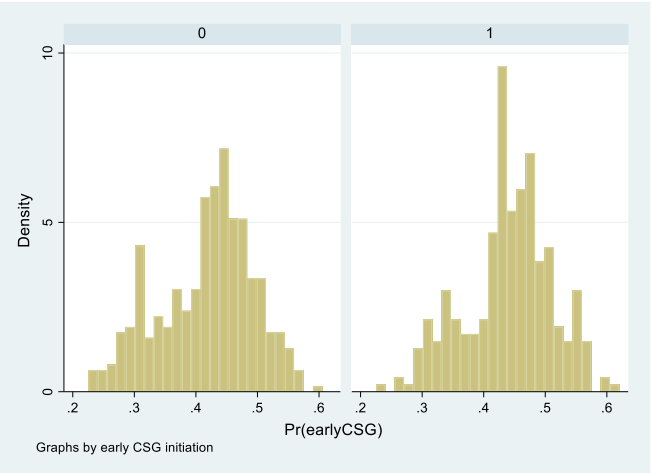


Figure 5A: Early CSG Receipt Probit Model
Sensitivity/Specificity plot



The predicted probability distributions (Figure 6A) reinforced these concerns, showing substantial imbalance between early and non-early recipients. These diagnostic patterns strongly supported the need for selection bias correction.

Figure 6A: Early CSG Receipt Probit Model
Histogram of predicted probabilities by CSG status



Multivariable hierarchical probit regression exploring the associations with early CSG receipt and controlling for selection bias (Table 4A). With selection correction, caregiver support effect strengthened (16.2 percentage points, $p < 0.01$) and other significant predictors emerged.

Model 1 (Child Level Factors): Caregiver support showed strongest effect (14.9 percentage points, $p < 0.01$), followed by siblings (7.8 percentage points, $p < 0.10$). The IMR was significant ($p < 0.01$), confirming selection bias.

Model 2 (1 + Adolescent Mother Level Factors): Lower maternal education decreased early receipt likelihood by 12.9 percentage points ($p < 0.01$). Siblings effect strengthened (10.0 percentage points, $p < 0.05$), and being born to mother aged 16+ became significant (-11.1 percentage points, $p < 0.05$). Caregiver support remained significant (14.6 percentage points, $p < 0.01$).

Model 3 (household factors): Informal housing increased early receipt probability (11.5 percentage points, $p < 0.01$). Lower education's negative effect strengthened (-17.2 percentage points, $p < 0.01$), as did the effect of maternal age at birth (-12.6 percentage points, $p < 0.01$). Siblings (10.0 percentage points, $p < 0.05$) and caregiver support (16.2 percentage points, $p < 0.01$) maintained significance.

Model fit improved substantially across specifications (Pseudo R-squared: 0.0340 to 0.0524; chi-squared: 33.38 to 51.51), with consistently significant IMR coefficients indicating the importance of selection correction.

Table 4A: Early CSG Receipt Probit Regression Model with Inverse Mills Ratio

	(1) Model 1	(2) Model 2	(3) Model 3
Child is female	0.013	0.013	0.003
	(0.036)	(0.036)	(0.036)
Child has siblings	0.078*	0.100**	0.100**
	(0.041)	(0.041)	(0.041)
Child was born when mother was aged 16 or older	-0.067	-0.111**	-0.126***
	(0.043)	(0.045)	(0.045)
Child receives some caregiver support	0.149***	0.146***	0.162***
	(0.040)	(0.040)	(0.041)
Mothers highest school grade is 9 or less		-0.129***	-0.172***
		(0.043)	(0.045)
Mother is experiencing poor mental health symptoms		0.053	0.048
		(0.049)	(0.049)
Home is an informal dwelling			0.115***
			(0.044)
Home is in a rural area			0.030
			(0.041)
Household is food insecurity			0.043
			(0.043)
Conflict or violence at home			0.074
			(0.067)
Inverse Mills ratio	0.511***	0.684***	0.789***
	(0.106)	(0.117)	(0.125)
Observations	720	720	720
Chi-squared	33.38	43.01	51.51
Pseudo R-squared	0.0340	0.0438	0.0524
P-value	0.000	0.000	0.000

Note. This table presents the marginal effects from probit regression models examining factors associated with Early CSG receipt. Standard errors are shown in parentheses below the marginal effects. Binary variables show the change in probability of CSG receipt when moving from 0 to 1. Maternal age shows the change in probability for each additional year. Statistical significance is denoted by *** p<0.01, ** p<0.05, * p<0.1. Model 1 includes basic child demographics, model 2 includes child CSG eligibility requirements, model 3 includes mother level factors, and model 4 includes household level factors. The lower panel shows model fit statistics, including Chi-squared and Pseudo R-squared values. Significant increases in Pseudo R-squared are observed with every addition to the model, at $p < 0.01$, indicating improved model fit.

Model diagnostics. Including the Inverse Mills Ratio to correct for selection bias improved model performance (LR $\chi^2(11) = 51.51$, $p < 0.001$), with better classification accuracy (62.78%), more balanced prediction (39.61% sensitivity, 80.10% specificity), and increased discrimination shown in the post-correction ROC curve (AUC = 0.6534, Figure 7A) and sensitivity/specificity plot (Figure 8A).

Figure 7A: Early CSG Receipt Probit Model Receiver Operating Characteristic (ROC) curve (after controlling for selection bias)

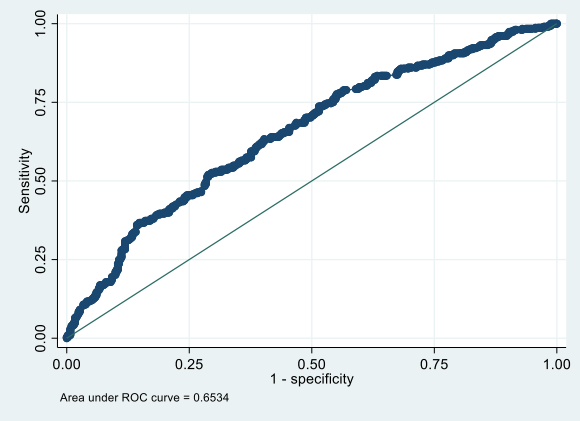
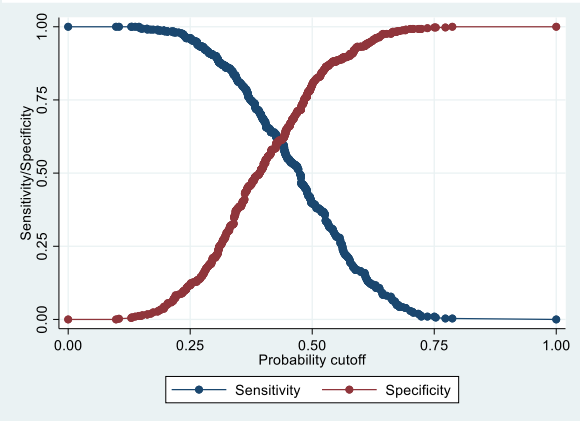


Figure 8A: Early Receipt Probit Model Sensitivity/Specificity plot (after controlling for selection bias)



The predicted probability distributions after IMR inclusion (Figure 9A) showed improved balance between groups. The highly significant IMR coefficient (2.13, $p < 0.001$) provided strong evidence of selection bias. Five cases showed Pearson residuals > |2| and three > |2.26|, all being early recipients with moderate leverage values (0.115-0.139).

Figure 9A: Early Receipt Probit Model Histogram of predicted probabilities by CSG status (after controlling for selection bias)